

RESEARCH UPDATE

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Welcome to the Banco de España RESEARCH UPDATE

The Fall 2017 issue of the *Research Update* comes after a very active year at the Banco de España that featured an unusually large number of conferences sponsored, articles and working papers published, and new researchers hired. Our *Update* aims to inform the academic and policy-making communities about the results of these research efforts.

As usual, this issue of the *Research Update* includes several feature articles outlining policy-relevant findings from the work of Banco de España researchers. First, an article by M. Correa-López and R. Domenech argues that deregulation of service industries has provided a powerful boost to Spanish manufacturing exports. A second article, by I. Kataryniuk and J. Martínez-Martín, cautions that apparent productivity gains in emerging economies prior to the Great Recession may not prove permanent. A contribution by S. Mayordomo, A. Moreno, S. Ongena, and M. Rodríguez-Moreno analyzes the factors that lead banks to collateralize loans with real assets or personal guarantees, noting that personal guarantees have become much more common since 2011. Next, O. Arce, R. Gimeno, and S. Mayordomo document the effects of the ECB's recent purchases of bonds of non-financial corporations, showing that these actions not only eased credit conditions for issuers of eligible bonds, but also spilled over via expanded bank lending to other corporations, including small and medium enterprises. Finally, M. Alloza, P. Burriel, and J. Pérez describe a new quarterly fiscal database which they use to measure spillovers of fiscal expansions across several euro area countries.

This *Update* also documents the conferences that took place at the Banco de España in 2017, including its first Annual Research Conference, its first biennial Conference on Financial Stability, and activities co-organized with the European System of Central Banks (ESCB), the CEPR, the ADEMU network, the Bank of Canada, and the World Bank. We highlight these and other developments at the Banco de España in hopes that they will interest the broader research community, in Spain and internationally, and thereby contribute to an improved understanding of economic policy.

Óscar Arce
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FEATURES

SERVICE REGULATIONS, INPUT PRICES AND EXPORT VOLUMES: EVIDENCE FROM A PANEL OF MANUFACTURING FIRMS¹

MÓNICA CORREA-LÓPEZ AND RAFAEL DOMÉNECH

WORKING PAPER 1707

Using a panel of firm-level data from Spanish manufacturers, this study shows that better service regulation reduces the price of intermediate inputs paid by downstream firms. The beneficial cost effects of services reforms extend to both large and small-to-medium sized corporations (SMEs), but the former tend to enjoy greater gains. Likewise, in international markets, we identify an input cost channel through which service regulations affect the volume of exports, especially for large manufacturers. Our estimates indicate that, from 1991 to 2007, large firms increased their volume of exports by an average of 22% as a result of the direct input cost effect of services reforms. The firms that benefited the most typically belonged to industries more dependent on services. Furthermore, convergence to the “best practice” regulatory framework in services would have raised exports at least by an additional 10%.

Introduction

Since the 1990s the barriers to competition in certain services activities in the Spanish economy have been progressively lowered. The change in the regulatory framework has involved a substantial reduction in the barriers to entry for new firms, favouring more competitive market structures. As a result, Spanish regulation has moved closer to the best practice framework of the advanced economies (see Chart 1).²

Services have a significant influence on the ability of manufacturing firms to compete both in the domestic market and abroad. This is because services include high-technology activities such as telecommunications, logistics, and engineering services, which play an essential role in improving the efficiency of the industrial sector. Also, competitive strategies in industry, based on product differentiation and quality improvement, largely depend on the availability of specialised business services.

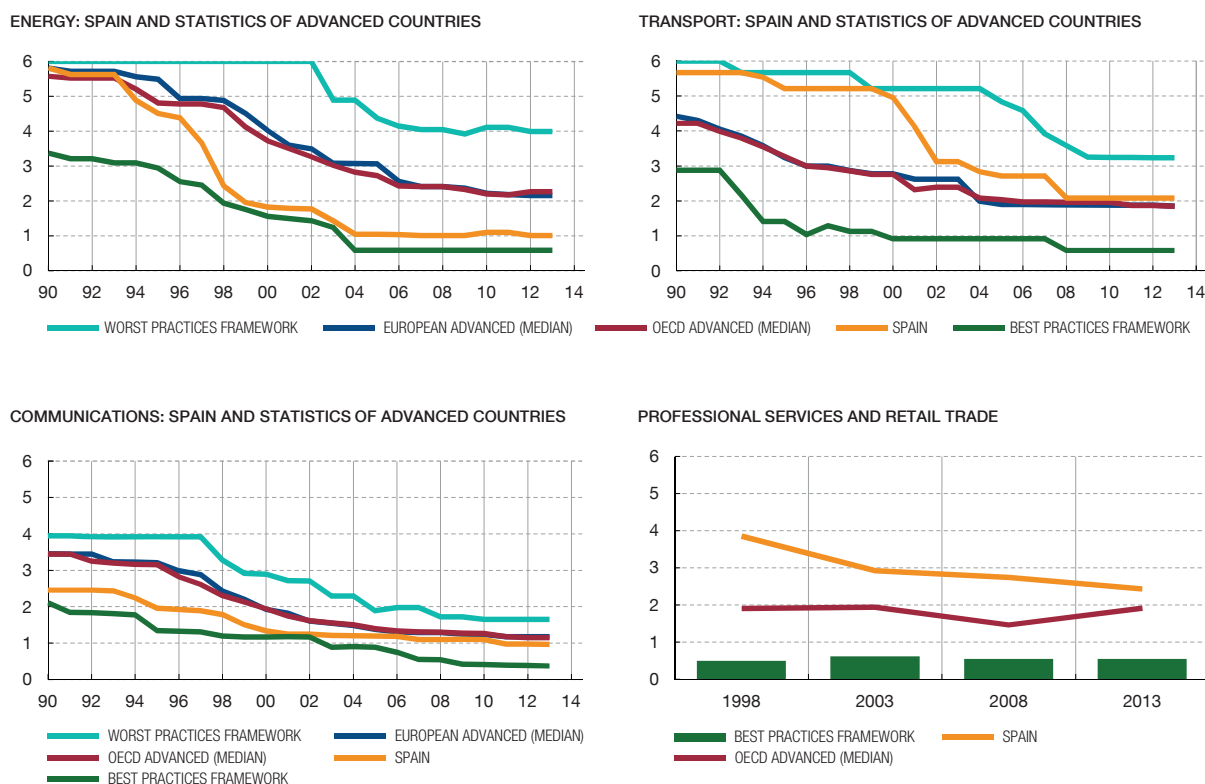
The empirical literature has largely addressed the effects of services deregulation on macroeconomic aggregates, such as growth, employment and inflation.³ More recently, some authors have quantified the economic impact of such reforms on the industrial base of OECD countries.⁴ Barone and Cingano (2011), for example, find that countries with a more competitive regulatory framework in services have higher growth rates of value added, productivity and exports in those manufacturing industries that make the most intensive use of services. This suggests that services regulation may affect the pattern of specialisation and international trade in the advanced economies. Yet, despite the emerging literature, none of the studies has empirically identified the transmission channel through which downstream firms' decisions and market outcomes are affected by upstream service regulations, whether this channel operates through, e.g., product innovation, process innovation or input price-setting mechanisms. Using firm-level data from Spanish manufacturers, this article addresses precisely this question and identifies an input cost channel through which service regulations affect manufacturing firms' export performance.

¹ This article is a summary of the research carried out in M. Correa-López and R. Doménech (2017).

² According to the OECD Product Market Regulation (PMR) indicators. This set of indicators quantifies de jure information on the regulatory environment for different market services in OECD countries. Direct quantification of competition in services (a de facto indicator) is less common in the literature. For further details, see Mora-Sanguinetti and Martínez-Matute (2014).

³ See, for example, Nicoletti and Scarpetta (2003), Griffith *et al.* (2007), Fiori *et al.* (2012) and Correa-López *et al.* (2014), among others.

⁴ See, for example, Barone and Cingano (2011) and Bourlès *et al.* (2013).



SOURCE: OECD.

a The indicator takes values between 0 and 6, with lower values denoting more efficient functioning of the markets.

Data and econometric strategy

The source of firm-level data is the Encuesta sobre Estrategias Empresariales (ESEE), an annual survey conducted by Fundación SEPI. The total sample comprises 29,137 observations covering information on 3,540 firms arranged in an unbalanced panel observed annually over the period 1991-2007 with an average of 8 observations per firm. Of the total 29,137 observations, 8,980 correspond to large firms (more than 200 employees) and 20,157 to SMEs (10 to 200 employees).

Summary statistics show that, on average, large firms export more, are more efficient and capital intensive, and are less leveraged and older than SMEs.⁵ They also face a lower inflation rate in intermediates, and have more market power and foreign presence in their ownership structure.

The indicator that measures the impact of the regulatory environment in the upstream market for service inputs on downstream manufacturing (REG_{jt})

⁵ See Table 1 of Correa-López and Doménech (2017).

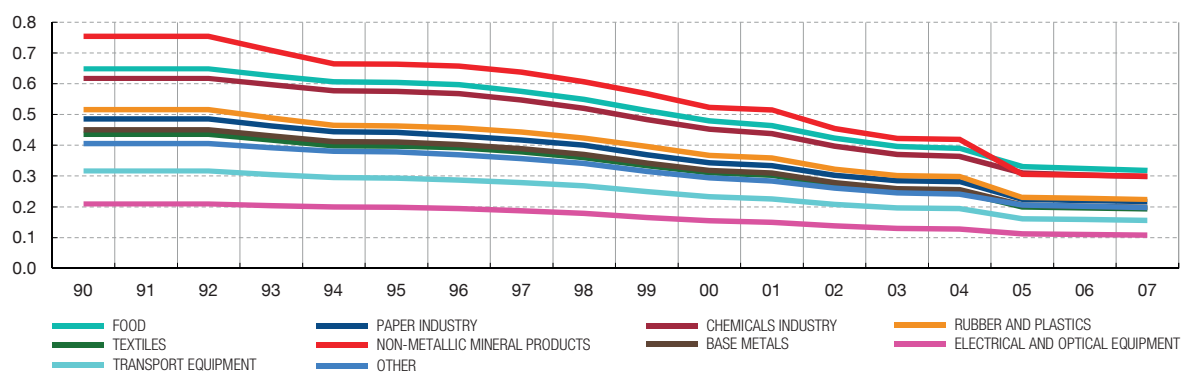
is built by combining information on the restrictions to competition in the energy, transport, communications and professional services sectors (Z_{st}), with an estimate ω_{js} of the level of dependence of manufacturing sector j on the output produced of service sector s .⁶

$$REG_{jt} = \sum_{s=1,4} \omega_{js} Z_{st}$$

Chart 2 depicts the evolution of the regulatory impact indicator for each manufacturing sector. The variability shown across sectors and over time reflects differences in the extent of service sector dependence of each industry, in the composition of the input services used, and in the initial level and pace of deregulation of each service.⁷

⁶ The food, non-metallic mineral products and chemicals industries are the most dependent on services (around 15% of total inputs), about three times more than the least dependent industry, electrical and optical equipment.

⁷ Services reforms were especially pronounced in the energy sector, followed by transport, communication and, to a lesser extent, professional services, while manufacturing dependence on professional services and transport has become increasingly relevant.



SOURCE: Authors' calculations based on OECD data.

a Higher values of the indicator denote a higher impact on manufactures of barriers to competition in the services sector.

REGULATION IN SERVICES AND INPUT PRICES

TABLE 1

Sample of manufacturing firms in Spain, 1991-2007 (a)

Regressor	Dependent variable: Change in price of inputs					
	Whole sample		Large firms		SMEs	
	Fixed effects	Random effects	Fixed effects	Random effects	Fixed effects	Random effects
Change in regulatory framework	0.184*** [0.040]	0.228*** [0.036]	0.258*** [0.073]	0.262*** [0.062]	0.181*** [0.053]	0.224*** [0.045]
Input price change in US manufacturing	0.261*** [0.036]	0.312*** [0.034]	0.369*** [0.063]	0.405*** [0.061]	0.217*** [0.044]	0.278*** [0.042]
World exports	0.014*** [0.006]	0.018*** [0.004]	0.022** [0.010]	0.022*** [0.006]	0.015** [0.007]	0.017*** [0.006]
Input imports	0.001** [0.001]	0.001** [0.001]	0.002*** [0.001]	0.003*** [0.001]	0.000 [0.001]	0.000 [0.001]
Recession	-0.003** [0.001]	-0.002* [0.001]	-0.002 [0.002]	-0.002 [0.002]	-0.003** [0.001]	-0.002 [0.001]

SOURCE: Authors' calculations, based on the ESEE of Fundación SEPI.

a All specifications include a constant, time dummies and industry. *** denotes statistical significance at the 1% level, ** at the 5% level and * at the 10% level, respectively. Figures in brackets are robust standard errors.

We implement a two-step econometric approach to identify the effect of regulation on exports going through the price of intermediate consumption. In the first step, we measure the effect of services regulation on the firm's price of intermediate inputs, controlling for other firm- and industry-level determinants. This step allows us to evaluate whether service regulation might be considered as a strongly informative instrument for intermediate input prices in the second step, which is a Generalized Method of Moments (GMM) procedure. Throughout the analysis, services reforms are treated as exogenous, derived from EU-wide directives and initiatives. In the second step, we regress the firm's foreign sales on the price of intermediate consumption. In light of the

results of the first step, we instrument the price of intermediate inputs with the regulatory impact indicator. We check for instrument validity and informativeness by adopting an incremental approach whereby the baseline specification is extended with additional determinants and estimated using alternative methods while addressing endogeneity issues.⁸

⁸ Our identification strategy consists of evaluating how the use of the regulatory impact indicator as an external instrument influences the coefficient on the price of intermediate consumption. We check for changes in coefficient size and significance both in a baseline model that omits firm attributes and in the full empirical model.

Regressor	Logarithm of real exports					
	(1) Fixed effects	(2) System GMM	(3) System GMM	(4) Fixed effects	(5) System GMM	(6) System GMM
Log of exports (t-1)	0.397*** [0.056]	0.434*** [0.087]	0.541*** [0.102]	0.330*** [0.058]	0.338*** [0.085]	0.340*** [0.086]
Price of inputs (as log)	-0.119 [0.145]	-0.354** [0.181]	-0.568** [0.238]	-0.354** [0.165]	-0.720*** [0.243]	-0.822*** [0.265]
Instrumental variable (REG)	No	No	Yes	No	No	Yes
Additional key regressors	No	No	No	Yes	Yes	Yes
Total factor productivity (as log)				0.727*** [0.117]	1.273*** [0.410]	1.248*** [0.380]
Size (as log)				0.529*** [0.074]	0.633* [0.365]	0.685* [0.360]
Age (as log)				-0.008 [0.022]	-0.083** [0.039]	-0.081** [0.038]

SOURCE: Authors' calculations, based on the ESEE of Fundación SEPI.

a All specifications include a constant, time dummies and industry. *** denotes statistical significance at the 1% level, ** at the 5% level and * at the 10% level, respectively. Figures in brackets are robust standard errors. See Correa-López and Doménech (2017) for a complete list of regressors.

Results

The results in Table 1 show a positive and significant relationship between the sector-specific change in the regulatory impact indicator and the firm-level rate of variation in the price of intermediate inputs. Considering that Spain undertook major services reforms in the period of study, the estimates indicate that the removal of barriers to competition in services reduced inputs inflation for manufacturers. Quantitatively, the first two columns suggest that increasing the deregulatory effort by 0.1 reduces input price inflation by an average of 2 percentage points. The magnitude of the effect appears to vary with firm size, with an effect of 2.6 percentage points for large firms (columns 3 and 4) and 2 percentage points for SMEs (columns 5 and 6). Small firms could possibly be at a disadvantage with respect to large firms when negotiating the best contract conditions with service providers.

On the other hand, the inflation rate for intermediate inputs of US manufacturing, in world real exports and in import prices are positively and significantly correlated with the inflation rate of intermediate consumption. These results indicate the presence of technology-, supply- and demand-side drivers of intermediate input prices, out of which, the price of intermediates in US manufacturing had the largest influence. Finally, a firm that reports a recession in its main market faces lower intermediates inflation,

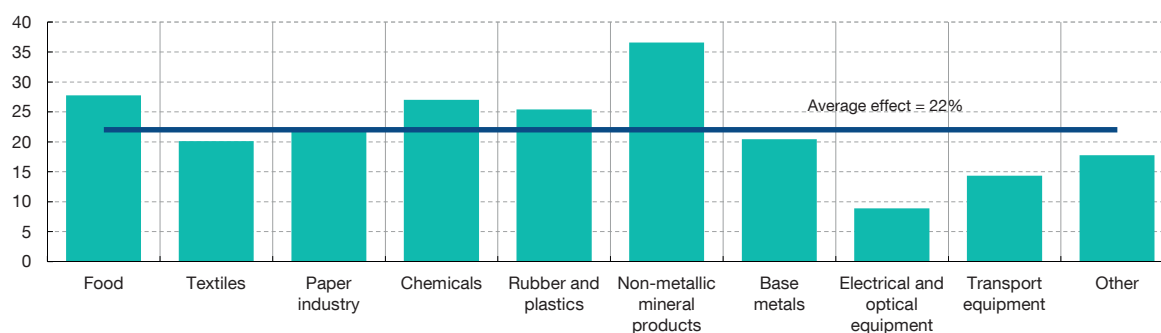
possibly because firms facing weak demand search more intensively for cost-effective suppliers or negotiate lower input prices.

Overall, our results indicate that service sector deregulation reduces the price of intermediate inputs paid by firms and that firm size is relevant for this link. Since the pro-competitive cost effect of deregulation is stronger for large firms than for SMEs, we expect that the impact of service regulations on firms' exports will be more evident among large firms.

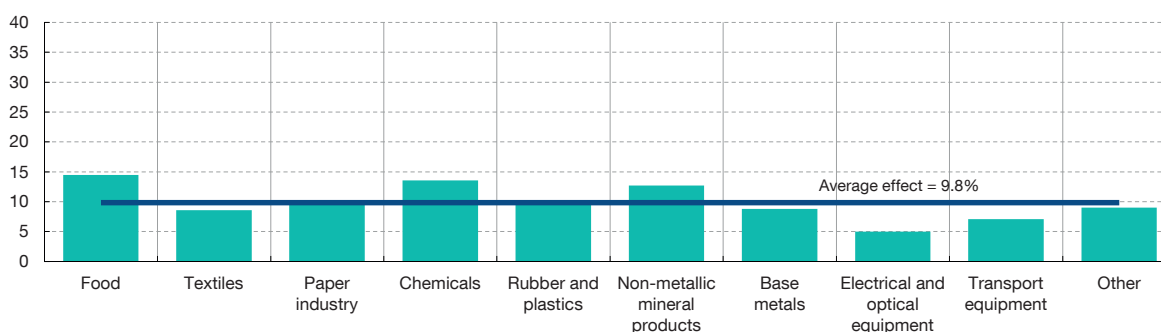
Table 2 shows the second step estimates for the sample of large firms.⁹ The results confirm that input prices

⁹ As an illustrative starting point, we first report the results of the OLS fixed-effects estimator. Then, we employ the System GMM estimator (Arellano and Bover (1995), Blundell and Bond (1998)), which effectively controls for the potential endogeneity of introducing lagged export volumes, input prices and firm-level characteristics in the specification. A common problem with system GMM is instrument proliferation: too many instruments can overfit endogenous variables and fail to remove their endogenous components. To limit the risk of instrument proliferation, we carefully restrict the number of lags to use as instruments for each endogenous variable and we collapse the instrument matrices, as proposed by Roodman (2009). Note that, unless stated explicitly, the discussed impacts are short-term, given the inclusion of the lagged endogenous variable.

EFFECT OF REFORMS IN THE REGULATORY FRAMEWORK OF THE SERVICES SECTOR COMPARED WITH A SCENARIO OF NO REFORMS, 1991-2007
Total change as percent by industry



EFFECT OF CONVERGENCE TOWARDS THE BEST PRACTICES FRAMEWORK, 1991-2007
Total change as percent by industry



SOURCE: Authors' calculations based on the ESEE of Fundación SEPI.

have a significant negative effect on the export volumes of large manufacturing firms. The inclusion of the regulatory impact indicator in the provision of services as an explanatory factor increases this effect (columns 3 and 6).¹⁰ Thus, the study identifies the presence of a transmission channel of services reforms to exports that works through the input costs borne by firms.

With regard to other determinants, in addition to the importance of the persistence mechanisms, the results indicate that firm size and productivity, in particular, have a significant positive effect on exports. Hence, according to the baseline results shown in column 6, a 1% rise in productivity is associated with an increase of 1.2% in exports, and a 1% increase in firm size raises exports by 0.7%. In contrast, there is a negative correlation between firm's age and export activity, which could indicate that the expansion strategy of younger firms is focused on growth in foreign markets. Capital intensity, market share, long-term debt, and foreign ownership are not found to be significant determinants of the volume of exports.

¹⁰ It also improves the model's significance and exogeneity tests. For further details, see Correa-López and Doménech (2017).

In the case of SMEs, the results shown in Table 3 confirm the significant negative effect of input prices on exports. However, the importance of the transmission channel of services reforms that operates through input costs is less evident from an empirical standpoint and is confined to the model in column 3. Table 3 reveals the relevance of size and, especially, TFP for the export performance of SMEs, with point elasticities of 0.9 and 2.4 per cent, respectively. Likewise, the results show that the SMEs reporting a recessionary main market witnessed a significant rise of their sales abroad. In addition, the estimates suggest that the age of the firm and the number of industrial establishments are negatively associated to the volume of exports.

Finally, we carry out two simulation exercises that tentatively illustrate the impact on firm-level manufacturing exports of adopting a more efficient regulatory framework in upstream services (see Chart 3). To this end, we take the empirical model of large firms shown in column 6 of Table 2 as the baseline and, in line with that model, the long-term elasticity of exports to the price of intermediate inputs is set at 1.25%.

Regressor	Logarithm of real exports					
	(1) Fixed effects	(2) System GMM	(3) System GMM	(4) Fixed effects	(5) System GMM	(6) System GMM
Log of exports (t-1)	0.482*** [0.027]	0.465*** [0.047]	0.480*** [0.047]	0.407*** [0.028]	0.352*** [0.064]	0.371*** [0.062]
Price of inputs (as log)	-0.152 [0.179]	-0.410* [0.235]	-0.578** [0.228]	-0.712*** [0.159]	-0.863* [0.442]	-0.859* [0.450]
Instrumental variable (REG)	No	No	Yes	No	No	Yes
Additional key regressors	No	No	No	Yes	Yes	Yes
Total factor productivity (as log)				0.811*** [0.099]	2.081*** [0.708]	2.380*** [0.689]
Size (as log)				0.667*** [0.080]	0.989*** [0.226]	0.892*** [0.204]
Age (as log)				-0.019 [0.037]	-0.120** [0.056]	-0.114** [0.054]
Recession				-0.087*** [0.034]	0.784 [0.532]	1.076** [0.459]
Number of establishments				-0.173 [0.106]	-0.383*** [0.109]	-0.347*** [0.101]

SOURCE: Authors' calculations, based on the ESEE of Fundación SEPI.

a All specifications include a constant, time dummies and industry. *** denotes statistical significance at the 1% level, ** at the 5% level and * at the 10% level, respectively. Figures in brackets are robust standard errors. See Correa-López and Doménech (2017) for a complete list of regressors.

The simulation exercise suggests that the improved regulatory practices in services activities had a strong impact on the input prices faced by firms, which would have increased by 17.7% more had there been no such improvement between 1991 and 2007. According to these estimates, the effect of services reforms channelled through the price of intermediate consumption increased exports by 22%, on average, compared with a hypothetical scenario of no reforms. Consistent with Chart 2, the firms that benefited the most belonged to industries typically more dependent on service inputs. On the other hand, had regulation moved closer to the best practice framework in 2007, the export volume of large firms would have been 9.8% higher, on average, than it actually was.¹¹

Conclusion

Growing evidence suggests that regulatory barriers to competition in inputs markets matter for the performance of downstream firms. In this article, we

¹¹ The best practices framework reflects average regulation in the three OECD countries whose regulatory framework is most conducive to competition.

estimate the impact of barriers to competition in services on the cost of inputs and the export performance of manufacturing firms in Spain, finding a significant impact on exports, especially for larger firms. Our estimates suggest that additional gains in the degree of competition could further improve the export performance of the Spanish economy.

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TFP GROWTH AND COMMODITY PRICES IN EMERGING ECONOMIES

IVÁN KATARYNIUK AND JAIME MARTÍNEZ-MARTÍN

WORKING PAPER 1711

Total Factor Productivity (TFP) growth in emerging economies has been falling in the last few years, particularly in commodity-exporting economies. In this paper, we explore different determinants of TFP growth in the short run and find that shocks in commodity prices have been highly correlated with the evolution of productivity, although the recent decline has been also related to negative supply shocks.

Total Factor Productivity (TFP) is an important but poorly understood driving force of economic growth, defined as a residual after growth by means of factor accumulation, both in labor and in capital, is eliminated. Therefore it is especially relevant when factor accumulation is subdued (Easterly and Levine, 2001). In this regard, many commodity-exporting emerging economies (EMEs) are undergoing a process of adjustment of their potential output. This coincides with a decline in commodity prices, after a period in which commodity prices and economic activity both grew rapidly. This phenomenon has been documented by several related papers, either for EMEs in general (Tsounta, 2014) or for economic or geographical areas (Sosa et al., 2013, for Latin America, or Anand et al., 2014, for East Asia).

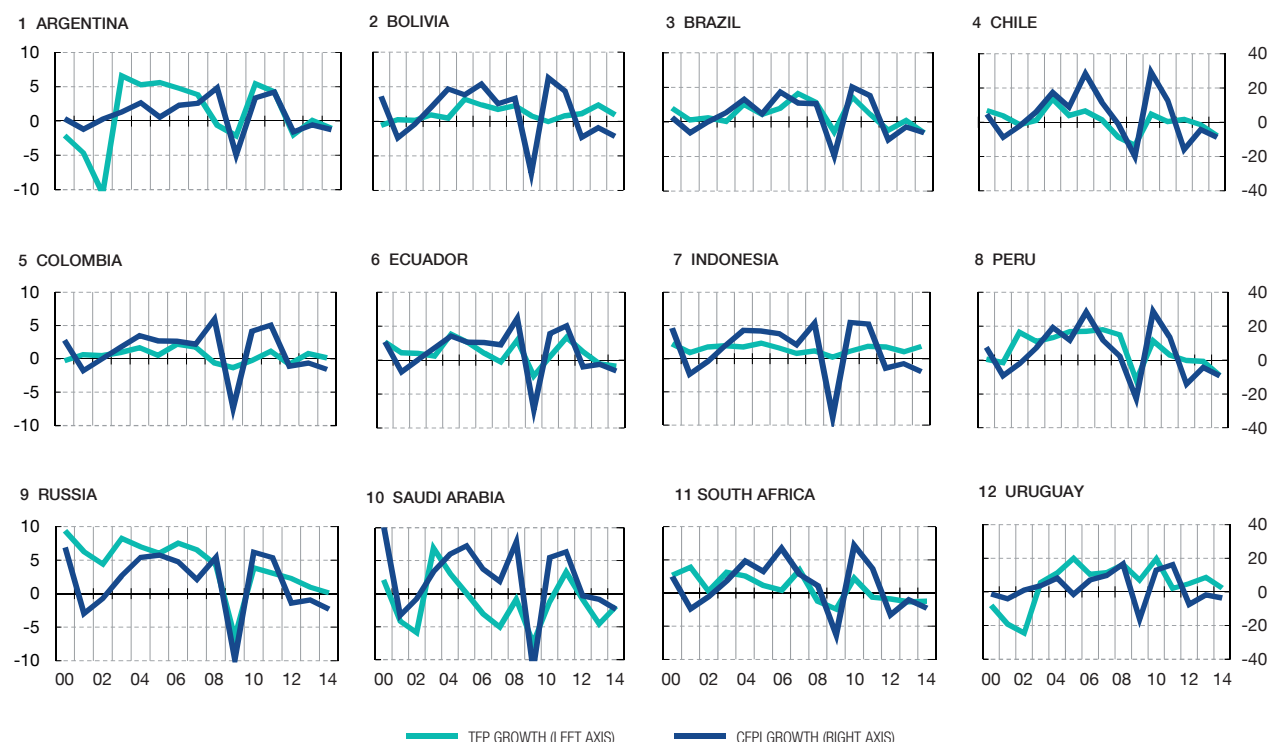
In the long run, one might expect that commodity prices should not have any effect on potential output. However, their effect in the short and medium run is less clear. Shifts in commodity prices may either alter investment decisions or generate labor force reallocations toward different sectors. Moreover, complementarities between commodity sectors and manufacturing/services sectors could lead to a positive correlation of TFP and commodity prices in the short run (Ferraro and Peretto, 2015). In this regard, recent studies show that some sectors, especially non-tradables, have been positively affected by commodity price booms (De la Huerta and García-Cicco, 2016). To better understand TFP, the recent evolution of commodity exporters is an interesting case to study, as their TFP growth plummeted at the same time that international prices of most commodities suffered huge corrections (see Figure 1).

Methodology and selection of variables

This study aims to analyze empirically the cross-country impact of commodity prices shocks on aggregate TFP growth for a sample of EMEs. First, under a growth accounting framework with a Cobb-Douglas production

COMMODITY PRICES INFLATION AND TFP GROWTH (%)

FIGURE 1



function (calculating TFP as the growth residual after taking into account labor units and physical capital), we estimate country-specific annual TFP growth (1992-2014).

Second, we construct country-specific commodity prices indices and we use a Bayesian Model Averaging (BMA) approach¹ to select a static model that explains TFP growth on the basis of a pool of variables used in the literature, including cyclical variables, such as output and credit gaps (constructed as the cyclical components of output and credit after HP filtering), as well as structural variables, in order to test whether commodity prices growth is robustly correlated with TFP growth. The results of the BMA estimation suggest that fluctuations of commodity export prices in commodity-exporting countries are a robust predictor of TFP variation.² Also, TFP is found to be strongly cyclical, as demonstrated by the substantial explanatory power of the output gap for TFP. The empirical results imply that a decrease of 10% in commodity prices is associated with a drop of around 0.6-1.0 percentage points of TFP growth per year for an average commodity-exporting EME. Other variables selected under a random-effects estimation are discarded once the existence of fixed effects is taken into account.

Using the findings of the previous part, in a third step we address endogeneity, and the dynamic behavior of the variables, in order to identify the effects of structural shocks. We propose a panel Bayesian VAR, based on Canova and Ciccarelli (2013), and we introduce cross-sectional heterogeneity as in Jarocinski (2010). For each country unit i we estimate:

$$y_{i,t} = A_i^1 y_{i,t-1} + \dots + A_i^p y_{i,t-p} + C_i x_{i,t} + \varepsilon_{i,t}$$

where $y_{i,t}$ is a vector of endogenous regressors including the output gap and TFP growth, and $x_{i,t}$ is a vector of exogenous variables including commodity prices growth.

¹ By model averaging, we are able to correct for potential model uncertainty problems (with the risk of over-fitting and over-parameterization) and eventually select an optimal model specification, as in Danquah et al. (2014).

² We have constructed a Commodities Export Price Index (CEPI), considering those commodities defined by the UNCTAD classification. Each country-specific weight is calculated on an annual basis over the value of total exports. To maintain constant weights, the final weight for each category in the index is the average of each product's weight for all years in the country.

Our structural analysis is restricted to nine commodity-exporting EMEs (Brazil, Bolivia, Chile, Colombia, Ecuador, Indonesia, Peru, South Africa, and Uruguay) over the period 1992-2014. This sample is chosen due to computational restrictions, and to ensure comparability, as our modelling approach generates a common steady state for all country units.³

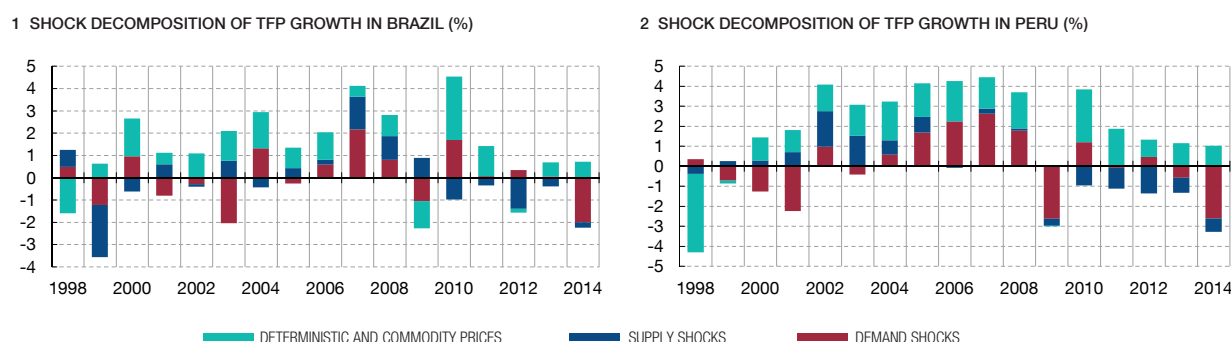
In order to identify shocks in the endogenous variables, we rely on a Cholesky ordering of the output gap and TFP growth. In principle, the output gap should capture business cycle fluctuations more related with demand shocks, which usually fade away in the medium run. By contrast, TFP growth ought to capture supply shocks, with a permanent effect, even though we have seen that other factors help explain TFP in the short run. However, the theoretical literature does not provide clear evidence to guide the exogeneity ordering of the variables. We address this issue by performing panel Granger-Causality tests to shed light on the direction of this relationship. We find that Granger-causality goes from output gap to TFP growth, consistent with our earlier finding of highly pro-cyclical TFP growth. Hence, by ordering shocks to the output gap last in our VAR, we make the identifying assumption that TFP shocks only affect the output gap after one year, while shocks to the output gap and commodities prices can affect TFP growth contemporaneously.

Results

The results of the panel VAR suggest that an increase of 10% in commodity prices is associated with an aggregate TFP expansion of about 0.4 percentage points, once endogeneity is taken into account. However, we find evidence for a high degree of cross-sectional heterogeneity, as commodity prices growth is not homogeneously significant in the country-specific estimations (it is positive and significant for Brazil, Ecuador, and Peru, but not significant for the other countries).

A matter of particular interest within our empirical approach is to establish the contribution of each structural shock to the historical dynamics of TFP growth. Hence, Figure 2 depicts the historical decomposition of the three shocks under consideration (i.e., demand, supply,

³ The model includes two lags of the endogenous variables, based on the AIC tests, and features only commodity prices as structural shocks. As expected for small, open economies, commodity prices growth enter the model as an exogenous variable affecting both the output gap and TFP growth contemporaneously.



and commodity prices) for the case of Peru and Brazil. For these countries, our findings attribute an important role to favorable commodities prices to high TFP growth prior to the Global Recession. However, the recent slowdown in productivity in both countries is mostly attributed to demand shocks and especially to negative supply shocks, rather than commodities prices. Hence, the contribution of the commodity prices shock to TFP growth after the Global Recession was too small, or insufficiently durable, to avoid the more recent falling path.

Finally, to illustrate the influence of the favorable cyclical environment on TFP growth over the last decade, in Figure 3 we display a measure of TFP growth adjusted for the economic cycle and for changes in commodity prices, constructed by subtracting the contributions of these two components from the raw series. Again, we see that much of the positive TFP growth performance in the last decade in many commodity exporters can be attributed to a favorable cyclical context. This suggests that both policymakers and scholars should reconsider previous TFP estimates which have been published without considering cyclical adjustments.

Robustness

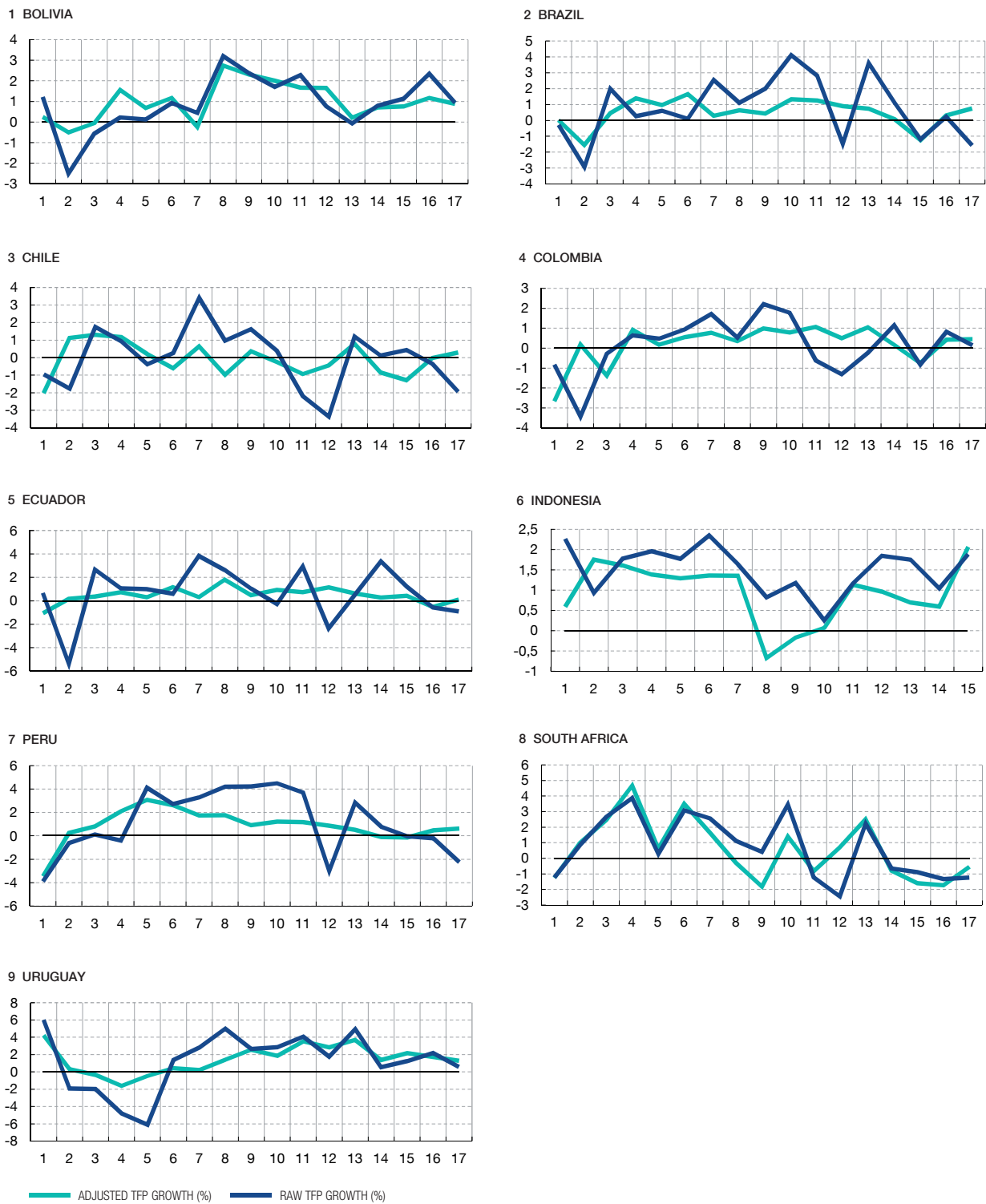
Since there have been important changes in the share of commodity groups over the sample period, it could be relevant to check whether patterns of development of advanced commodity-exporters differ in the short run from those of EMEs. To check for robustness, we extend the countries in our sample and split it into two groups, repeating the BMA analysis for both subsamples. Interestingly, we find that the output gap, commodity price growth, economic complexity, and credit levels are robustly correlated with TFP growth in both subsamples (advanced and EMEs). Although the economic effects of commodity price growth are lowered, they are still sizable.

As an additional robustness exercise, we follow Hamilton (2016) and explore alternative methods, besides the Hodrick-Prescott (1997) filter, to calculate country-specific output gaps. We find that median country-specific responses of TFP growth to commodity export prices are even larger under these alternative output gap measures than the responses we found using HP filtering.

Conclusions

A correct measurement of TFP growth is paramount for developing economies, since TFP is crucial for economic growth in the long run. However, the impact of short-run developments could lead to a biased diagnosis of the sustainability of current growth. To shed light on this issue, this paper proposes an empirical framework based on the estimation of robust determinants of TFP growth (1992-2014) by means of model averaging techniques for commodity-exporting economies. Subsequently, we rely on a panel Bayesian VAR model accounting for cross-country heterogeneity to identify the effects of structural shocks.

Our main contribution is to take a systematic approach to a controversial topic –the impact of commodity prices on TFP growth in EMEs. Our results suggest that the recent behavior of TFP growth in commodity-dependent economies is partially explained by: (i) the correlation between TFP growth and the business cycle; and (ii) the correlation between TFP growth and commodity prices. Moreover, TFP growth in each country reacted heterogeneously to commodity prices changes. However, these negative short-run factors cannot fully account for the recent slowdown in productivity. After considering the variation produced by the output gap and commodity prices, TFP growth continues on a downward path, with a notable impact of negative supply shocks.



All in all, our results raise questions about productivity measurement in commodity-dependent economies. If traditional TFP measures are influenced by changes in commodity prices in the short run, it would make it hard to estimate the effects of structural reforms in such economies. Nevertheless, the qualitative takeaway from this paper is that the

higher productivity levels achieved in commodity-exporting EMEs before the Global Recession would not have been sustained in an alternative environment characterized by lower commodity prices. As a result, improving structural factors becomes vital to recover the convergence path towards advanced economies.

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**“KEEPING IT PERSONAL” OR “GETTING REAL”?
ON THE DRIVERS AND EFFECTIVENESS OF PERSONAL
VERSUS REAL LOAN GUARANTEES**

SERGIO MAYORDOMO, ANTONIO MORENO, STEVEN ONGENA
 AND MARÍA RODRÍGUEZ-MORENO
 WORKING PAPER 1715

Little is known about the drivers and effectiveness of personal versus real loan guarantees. We study unique data from 477,209 loan contracts granted to firms between 2006 and 2014 by a Spanish bank with many independent subsidiaries. While personal guaranteeing responds to firm and bank conditions, real guarantees are mostly tied to loan characteristics. The higher capital requirements imposed by European authorities in 2011 increased personal guarantee requirements more than their real counterparts. But while personal guarantees in general discipline firms in their risk-taking, their overuse seemingly blunts this effect and undermines firm performance.

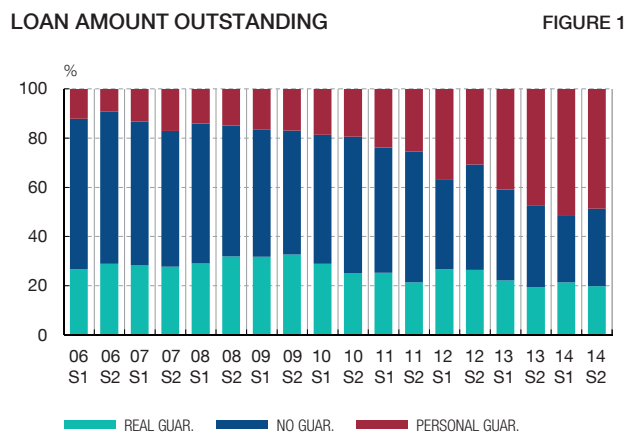
Introduction

Why are some bank loans collateralized with personal guarantees while other ones employ real assets, and others are not collateralized at all? Which characteristics of firms and loans drive this decision? Did recent changes in bank regulation have any impact on the guarantees required by banks? If so, what type of guarantee is now preferred and why? Do borrowers mitigate their risk and/or enhance their profitability when subject to a specific type of guarantee? These are some of the questions addressed in a recent paper by Mayordomo, Moreno, Ongena and Rodríguez-Moreno (2017), which we summarize here.

Collateralized loans may be backed by personal or real guarantees. Personal guarantees involve the direct and joint liability of one or more guarantors, these being persons (e.g., firms’ managers or third parties) or institutions (e.g., official institutions or mutual guarantees societies) whose solvency is sufficiently demonstrated to deal with borrower default. Theoretically, a personal guarantee leads to a transformation in the nature of the firm’s responsibility: a limited responsibility firm effectively becomes an unlimited responsibility firm if a loan is backed by personal guarantees. In contrast, real guarantees simply refer to specific assets, such as real estate, financial or movable assets, that the lender can subsequently sell in the case of borrower default. Most loan agreements involving personal guarantees

represent general claims against present and future wealth and typically do not restrict the borrower’s use of that wealth, while real guarantees include restrictions on the use that borrowers can make of the pledged assets.

Figure 1 depicts the evolution of the proportion of the value of loans backed by personal and real guarantees, for a Spanish financial institution and its subsidiaries from the first semester of 2006 to the second semester of 2014. The figure shows that the outstanding loan amounts without explicit guarantees significantly decreased over time. It also reveals different patterns in the imposition of personal and real guarantees. While the amount collateralized through personal guarantees displays a significant increase, particularly after the second semester of 2011, the proportion corresponding to real guarantees remains stable. The increase of collateralized loans (of either guarantee type) may be related, on the one hand, to the need to mitigate credit risk in a context of uncertainty and weak global economic conditions. On the other hand, guarantees play a key role in capital regulation, where assets weighted by their risk level are fundamental.



The empirical literature so far has mainly focused on the determinants behind the use of real guarantees or collateral (e.g., Jiménez et al., 2006; Berger et al., 2011). Because of data limitations, less is known about the determinants of personal guarantees usage and, in general, about the differences between personal and real guarantees. In this paper, we break new ground by examining the determinants of the imposition of personal versus real guarantees, their use to improve bank loan

portfolio credit risk and capital ratios, and the implied costs and benefits for the firm. To address these questions, we use a unique and proprietary dataset of 477,209 loan contracts granted over the 2006-2014 period by a Spanish financial institution and its subsidiaries.

Different Drivers for Different Types of Guarantees

Our first research goal is to analyze whether the two types of guarantees are driven by different factors, by means of an OLS regression where the existence/absence of personal or real guarantees (1/0) in a given loan contract i , denoted as G_i , is regressed on several sets of variables, relating to characteristics of the branch (distance between the bank branch and the headquarters), of the loan (maturity and size), of the firm (total assets, leverage, return on assets (ROA) and a refinancing dummy) and of the bank/subsidiary-firm pair (a dummy based on existence of additional outstanding contracts between the parent bank or a subsidiary and the firm). The regression also includes fixed effects for each sector, bank/subsidiary, year, and province:

$$G_i = \alpha + \beta_1 BB_o + \beta_2 L_i + \beta_3 BF_{b,f,t} + \beta_4 F_{f,t} + \theta_s + \mu_b + \gamma_y + \delta_p + \varepsilon_i(1)$$

Here BB_o , L_i , $BF_{b,f,t}$ and $F_{f,t}$ stand for branch, loan, bank/subsidiary-firm, and firm characteristics, respectively. Both bank/subsidiary-firm and firm characteristics refer to the month before the loan is granted (t). The subscript b denotes the bank/subsidiary granting the loan in branch o to firm f operating in sector s and located in province p . The subscript y denotes the year in which the loan is granted and so, the term γ_y refers to the use of year fixed effects. Standard errors are clustered at the firm level.

The resulting coefficients on loan maturity are positive and significant for both personal and real guarantees. This is in agreement with previous literature (see Boot et al. (1991) among others) which showed that for longer-maturity loans, banks are more likely to request collateral, to align the incentives of the borrower and the lender. However, this effect is larger in economic terms in the case of real collateral, supporting the idea that as loans become longer-term, e.g., mortgages, the bank relies more on tangible real assets than on personal guarantees, which may be more uncertain since they depend on the firm's manager's present and future wealth. For the same reason, in the presence of large loans, the bank may prefer to request real collateral to seize the real assets in case of default.

The moral hazard literature documents that when lenders can observe a borrower's credit quality, low-quality borrowers obtain loans with collateral while high-quality borrowers obtain loans without having to pledge collateral (Boot et al., 1991; Berger and Udell, 1990 and 1995; and Jiménez et al, 2006). In line with this theory, we document that overall, firm characteristics suggesting higher creditworthiness imply lower guarantees requirements. Moreover, we document that banks prefer personal guarantees when the economic conditions of the firm and/or the overall economy deteriorate, perhaps because personal guarantees are the ones with the strongest effects on incentives (Voordeckers and Steijvers, 2006).

In view of these results and the explanatory power associated to each group of variables, we conclude that real guarantees are mostly driven by loan characteristics, whereas personal guarantees are mostly driven by overall economic conditions. Indeed, the year fixed-effects coefficients (γ_y) increase sharply after 2011 for the case of personal guarantees. This effect could be driven by the Spanish economic and financial crisis, or by requirements that European banks improve their capital ratios – we further elaborate on this point in the next section.

What Changed After 2011 in Guarantee Requirements?

Figure 1 reveals a noteworthy change of strategy with regard to guarantees requirements in 2011. Concretely, after October 2011 there is a sharp increase in the requirement of personal guarantees. This is the outcome of a combination of two events: i) recommendations and measures following the July 2011 stress test results in an environment of weak economic conditions; and ii) the EU agreement in October 2011 that required European banks to increase their capital buffers.

Both events help explain the increasing demand for guarantees since these represent a natural mechanism to limit losses and to align the interests of creditors and debtors by mitigating default rates. Moreover, effective guarantees (i.e., guarantees that fulfill certain regulatory criteria) might contribute to improved capital ratios by reducing risk-weighted assets (RWA). In fact, the European Banking Authority (EBA) highlights the usefulness of improvements in collateral and guarantees as a mitigating measure to reduce RWA. In this context, it is relevant to investigate the factors behind banks' use of each type of guarantee from 2011 onwards.

One factor favoring personal guarantees is their role as a discipline device to limit the borrowers' incentives to take risks, more effectively than business collateral (Mann, 1997). Moreover, personal guarantees could be more valuable than real guarantees if the guarantor's personal assets are easier to value or sell, compared to certain firm-specific assets or human capital (Bodenhorn, 2003). Another reason to use personal guarantees is their potential efficiency advantage for the bank: personal guarantees can be rapidly and efficiently executed through extrajudicial enforcement. Finally, personal guarantees could also be of interest for banks to reduce their RWA. All of these incentives suggest that personal guarantees will be preferred to real guarantees in the post-October 2011 context.

To test this hypothesis, we estimate equation (1) using a 3-month window before and after October 2011 on the same set of explanatory variables with the exception of the year fixed effects.¹ We include a dummy for the policy change that takes the value one after October 2011, and equals zero otherwise.

We find that the use of personal and real guarantees is significantly more widespread after the bank guarantee policy change, with personal guarantees increasing substantially more. In fact, half of the variation in the use of personal guarantees is explained by this policy change. Results for real guarantees stand in stark contrast, as the policy change only explains around three percent.

One may argue that if the bank uses guarantees to improve its regulatory capital, better capitalized subsidiaries should require guarantees less frequently. We take advantage of information about the specific bank/subsidiary granting the loan to conduct a formal test on this issue. To that end, we supplement equation (1) with a dummy variable that equals one if the total capital ratio of the bank/subsidiary granting the loan is above the median across the bank and its subsidiaries, and its interaction with the policy change dummy (the dummy equals one after October 2011).² We document that credit institutions with a better capital position make less use of both real and personal guarantees. The lower use of guarantees by better capitalized subsidiaries is even more evident in the case of personal guarantees after October 2011, confirming the idea that the policy change affected those subsidiaries with lower capital ratios.

¹ We add to the specification a proxy for overall economic risk, as measured by the 5-year sovereign CDS spread.

² The bank/subsidiary fixed effects used in the baseline regression are excluded from this specification.

Guarantees, Firms' Risk-Taking and Performance

We finally analyze whether guarantees lead to lower default rates and higher firm profitability, with a special focus on the post-October 2011 period.

A common result in the scarce literature analyzing the performance of firms that take out secured loans is that collateralized loans exhibit higher default probabilities because borrowers that pledge collateral are riskier ex-ante (Jiménez and Saurina, 2004; and Berger et al., 2011). However, Berger et al. (2016) show that the effect of collateral on ex-post performance could depend on the specific type of collateral. Thus, they find that liquid collateral has stronger risk-reducing incentives.

Our setting allows us to analyze in detail the risk and performance profiles of firms depending on whether the lender requires personal or real guarantees.

We first analyze firms' risk-taking, as measured by a dummy variable that takes the value of one if a firm defaults on its loan within a year after the first time it pledged guarantees, conditioned on not having defaulted prior to that event. Those individual firms that pledged guarantees for the first time in a given loan contract (treatment group) are then matched to a control group. This group consists of firms in the same industry, with similar size and profitability that got the loan the same year as the corresponding firm in the treatment group but did not pledge guarantees after the granting of the loan and did not pledge guarantees in the prior three years. The indicator of default for each firm in excess of the average indicator in the corresponding control group is then regressed on a constant. The resulting coefficient represents the probability of a loan default for those firms that pledged guarantees (treatment group) for the first time (i.e., we exclude repeat uses of guarantees) in excess of the average probability of default of the corresponding control group. We perform two regression analyses for the two types of guarantees using two different time periods corresponding to the year in which the loans were granted: 2006-2010 and 2012-2013.

Besides studying default, we also perform a similar analysis, using the same treatment and control groups, to study the effect of guarantees on firms' performance. The dependent variable in the new analysis is the firm's excess ROA, which is defined as its ROA a year after the firm pledged guarantees for the first time in excess of the ROA of the control group. The control group consists of firms in the same industry with similar size,

profitability, and risk profile that got the loan the same year as the corresponding firm in the treatment group but did not pledge guarantees to obtain the loan.

Results show that for those loans granted during the period 2006-2010, personal guarantees were associated with a significant reduction in firm risk whereas the effect of real guarantees is not statistically different from zero. In fact, the economic effect, obtained as the estimated coefficient for the treatment group relative to the average default probability of the treatment group before the event, is sizeable in the case of personal guarantees, i.e., -9.5%. Personal guarantees could have led managers to increase their effort level and to lower their risk-appetite to avoid losing their pledged personal wealth in case of default. Moreover, the beneficial effect of personal guarantees on loan default probabilities is not associated with a decrease in firms' performance.

However, when analyzing loans granted in 2012-2013, personal guarantees are not associated with a significant reduction in risk-taking. The extensive use of personal guarantees in the second sub-period might have led to less selective decisions on the firms pledging guarantees, if they were used for regulatory capital purposes rather than to discipline borrowers. Thus, after the extensive use of this type of guarantees and the substantial increase in their coverage ratio,³ the borrowers' incentive to take any risk could be so low that it could discourage firms to undertake certain investments, affecting the efficiency of their investment decisions. This could explain the negative effect found in our paper on firm performance, and, as a consequence, on the real economy.

The strategy adopted after 2011 may be positive in terms of financial stability since it implies that banks can better hedge potential defaults and improve capital ratios. Nevertheless, the use of personal guarantees with a higher coverage ratio implies that the risk ultimately affects the incentives of firms' managers and

³ The coverage ratio is obtained as the proportion of the loan size that is hedged by the guarantee associated with that risk.

this could penalize the effectiveness of their decisions and their current and future enterprises. This result highlights that guarantees can also have costs, which are associated to their overuse.

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MAKING ROOM FOR THE NEEDY: THE CREDIT-REALLOCATION EFFECTS OF THE ECB'S CORPORATE QE

ÓSCAR ARCE, RICARDO GIMENO AND SERGIO MAYORDOMO

WORKING PAPER 1743

We analyse how the European Central Bank's purchases of corporate bonds under its Corporate Sector Purchase Programme (CSPP) affected the financing of Spanish non-financial firms. We first document that the announcement of the CSPP in March 2016 significantly raised these firms' propensity to issue CSPP-eligible bonds. The flipside was a drop in the demand for bank loans by these firms. Moreover, the drop in credit given to bond-issuers, which are usually large corporations, unchained a positive and significant side effect on the flow of new loans extended to firms, typically smaller, that do not issue bonds. Specifically, we find that around 78% of the drop in loans previously given to bond issuers was redirected to other companies, which, in turn, raised their level of investment. The previous reallocation of credit was amplified by the ECB's Targeted Longer Term Refinancing Operations (TLTRO).

1 Introduction

The Governing Council of the European Central Bank (ECB) announced in March 2016 the launch of a corporate sector purchase programme (CSPP) as an additional leg of its quantitative easing programme, known as the Asset Purchase Programme (APP). Under the CSPP, the Eurosystem buys debt securities issued by euro area non-financial corporations, with the goal of improving the pass-through of its monetary policy to the real economy. By October 2016, the market value of outstanding bonds eligible under the CSPP amounted to near 320 billion euros, and the Eurosystem had already purchased almost 12% of them.

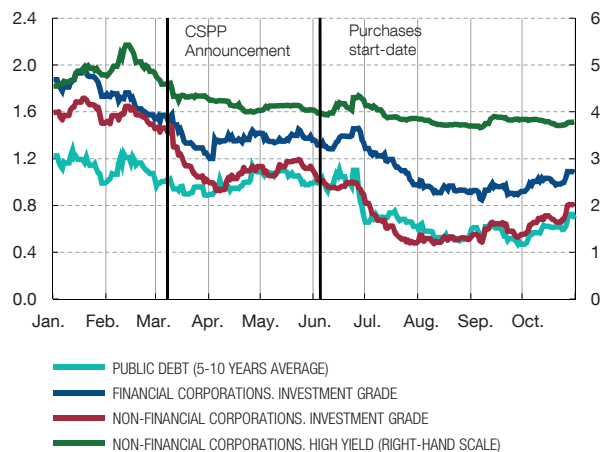
In this paper, we analyse how the CSPP changed the financing conditions and the external financing mix of Spanish non-financial corporations. In addition to the direct effects on firms issuing eligible bonds, we study the existence of potential side effects of the central bank's programme on the financing conditions of firms not issuing CSPP-eligible claims. The side effects or spillovers we look at operate through the reallocation of the supply of bank loans from firms issuing CSPP-eligible paper to companies that do not raise funding in the capital markets by issuing bonds, which are typically smaller than the issuers of CSPP-eligible bonds.

2 Direct effects of the CSPP

2.1 Cost of issuance

From the announcement of the CSPP in March 2016 until mid-April, the average yield of eligible bonds issued by Spanish non-financial corporations decreased by 44 basis points (bp); see Figure 1. This decline represents 30% of the average yield during that period. The impact on eligible bond yields around the initiation of the CSPP purchases, in June 2016, was more modest, which suggests that the effect of the programme may already have been factored into bond prices by that time. Interestingly, the effect of the programme was not limited to CSPP-eligible securities, but also extended to others, in particular, to bonds issued by non-financial corporations with credit ratings below investment grade (high-yield bonds).

AVERAGE YIELD OF SPANISH LONG-TERM DEBT SECURITY ISSUES (%) FIGURE 1



The results of an econometric analysis show that the average yield of eligible bonds dropped 46 bp more than the overnight indexed swap (OIS) rate from the announcement of the program to the date when the purchases began. From then until the end of the sample (July 2016) the excess yield of the eligible bonds continued decreased further, but by a smaller amount (7.6 bp).¹

¹ The end of the sample period is determined by data availability on specific bond purchases.

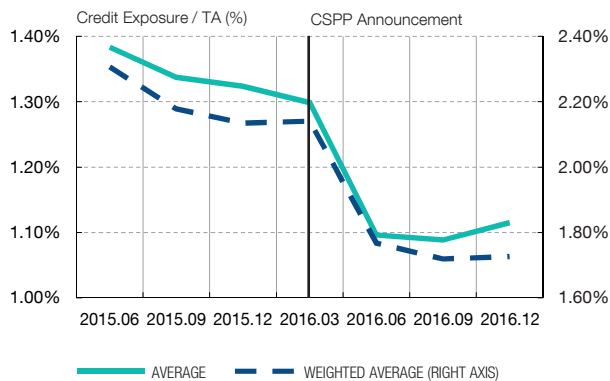
2.2 Bond issuance activity

Beyond the effects of CSPP on yields, we also show that groups issuing CSPP-eligible bonds raised their volume of new issuances following the launch of the programme.² Concretely, we find that the announcement of the CSPP pushed up by almost one third the probability that groups issuing eligible bonds increased their issuances. The effect of the programme was not limited to CSPP-eligible securities, but also extended, although to a lesser extent, to other bonds. Specifically, the probability that groups with non-eligible bonds increased their issuances rose by 6% in the quarter following the date of announcement.

We are also interested in knowing whether the funds obtained from the newly issued bonds under the CSPP served as a substitute for bank loans. To this end, we run a regression analysis in which the credit growth rate of a given group with a given bank between February 2016 and June 2016 is regressed on the group's net growth of bonds outstanding during the quarter following the announcement of the CSPP, and a set of control variables at group and group-bank level. The results show that for each 1% increase in the net amount of bonds outstanding in the quarter following the CSPP announcement, the credit balance of groups diminished, on average, by around 0.44%. Hence, parallel to the increase in issuance activity, there was a substantial decrease in the credit exposure of resident credit institutions to the bond-issuing companies, as measured relative to total assets (see Figure 2).

RELATIVE CREDIT EXPOSURE OF RESIDENT CREDIT INSTITUTIONS (OVER TOTAL ASSETS) TO DEBT ISSUER GROUPS AROUND AND AFTER ANNOUNCEMENT OF THE CSPP

FIGURE 2



² We consider groups instead of firms in this analysis because domestic and foreign subsidiaries are responsible for an important fraction of groups' bond issuances.

3 Indirect effects of the CSPP

3.1 The credit reallocation channel

Against the previous contraction in the demand for loans by large bond-issuing corporates, we next analyze the role of the CSPP in promoting a reallocation of credit to non-bond issuing firms. To this aim, we use a regression analysis in which the dependent variable is the increase in the credit balance of firm j at bank b one month before the announcement of the CSPP (February 2016) and one quarter afterwards (June 2016), divided by the average credit balance in both periods ($Credit_{j,b}$). The main explanatory variables are the ratio of total credit outflows from bond issuers relative to bank b total assets during the time window mentioned above ($Outflows/TA_b$), and the interaction of the previous variable with two dummy variables related to the size of firm j that denote whether it is a medium-sized ($D.Median_j$) or micro-small ($D.Small_j$) firm. In addition, we include some variables related to the characteristics of the bank and the firm:

$$\begin{aligned}
 Credit_{j,b} = & \\
 & \alpha + \beta_1 Outflows/TA_b \\
 & + \beta_2 D.Median_j \\
 & + \beta_3 D.Small_j \\
 & + \beta_4 D.Median_j \times Outflows/TA_b \\
 & + \beta_5 D.Small_j \times Outflows/TA_b + \delta F_j \\
 & + \gamma B_b + \theta FB_{j,b} + \varepsilon_{j,b} \quad (1)
 \end{aligned}$$

Here, the coefficient β_1 can be interpreted as the percentage change in credit granted to non-issuing large firms one quarter after the announcement of the CSPP, given an outflow of 1% in the credit balance of firms that are bond issuers. The sum of coefficients β_1 and β_4 (β_1 and β_3) can be interpreted as the change in credit to medium-sized (micro/small) firms after the announcement of the CSPP given the same 1% outflow in the credit balance of bond issuers. Firm variables, represented by F_j , include profitability and risk. B_b denotes a set of bank characteristics such as bank size, profitability, financial strength, risk profile, percentage of liquid assets over total assets, and business model. Our sample consists of 29 resident credit institutions including commercial banks, saving banks and credit cooperatives, and 303,915 Spanish non-financial corporations j that do not issue bonds. Finally, we include joint firm-bank characteristics, such as the length of the bank-firm relationship immediately before the CSPP announcement.

The information on loans is obtained from the Banco de España's Central Credit Register (CCR). We aggregate the outstanding amount of credit of each firm in each bank at a monthly basis to obtain total credit (both drawn and undrawn in the case of credit lines). The CCR is

merged with a second dataset, the Integrated Central Balance Sheet Data Office Survey (CBI), which includes information from firms' accounts filed with the mercantile registries. The CBI dataset enables us to classify the firms as micro/small or medium-sized firms according to the European Commission criteria.

The estimation of equation (1) reveals that banks that suffered a more severe reduction in credit demand from large bond-issuing companies increased their loans to large companies that did not issue bonds as detailed above, but also, although to a lesser extent, to medium-sized and micro/small firms. After controlling for bank and firm characteristics, we find that a drop of one euro in the credit balance of bond issuer groups led to an average increase of around 78 euro cents in the credit balance of firms that do not issue bonds one quarter after the announcement of the CSPP. In particular, the increase in the average credit balance was worth 48, 15, and 15 euro cents in the case of large, medium-sized and small firms. This represents 3.3%, 1.8%, and 0.8% of the firms' average credit balances before the CSPP announcement, respectively. Furthermore, the reallocation of credit towards non-issuing firms led to an increase in the investment of these firms.

Banks differentiate between large, medium-sized, and small firms probably because the latter are riskier and could lead to higher expected costs of absorbing potential losses. Thus, the cascade effect along the firm-size dimension derived from the substitution of bank loans by bonds by regular issuers could reflect the banks' attempt to preserve their risk profile to the extent possible. This conjecture is supported by the fact that banks suffering credit outflows from bond issuers mainly raised their flow of credit towards large and medium-sized firms, which are relatively safer borrowers than micro/small firms. Based on this conjecture, we extend the previous econometric analysis by splitting firms according to their risk instead of their size, and confirm that banks suffering credit outflows from bond issuers exhibit a strong preference for safer borrowers. Hence, minimizing the change in the risk profile of their loan portfolios appears to have been a central motive behind the profile of lending in this credit-cascade process.

3.2 The amplifying effect of the TLTRO on the credit reallocation channel

The ECB's CSPP programme overlapped with other unconventional monetary policy measures, including its Targeted Longer Term Refinancing Operations (TLTRO). The first phase of TLTRO was followed by a second series of four operations (TLTRO-II), announced on March 2016, coinciding with the CSPP announcement.

These operations were conducted once a quarter between June 2016 and March 2017. Under TLTRO-II, banks were able to borrow a total amount of up to 30% of the eligible part of their outstanding loans as of 31 January 2016, net of any amount previously borrowed under the previous TLTRO-I scheme and still outstanding at the time of the settlement of TLTRO II.

Banks were given the opportunity to repay funds borrowed under TLTRO-I early, and switch to TLTRO-II funds. In fact, as detailed in ECB (2017), the vast majority of these funds were transferred to the TLTRO-II scheme. This shift of funds between the two TLTRO programmes was attractive because the second programme lengthened the maturity of funding provided by the ECB and lowered its cost. In particular, counterparties will receive a maximum rate reduction equal to the difference between the main refinancing operations (MRO) rate prevailing at the time of allotment (which is 0% since March 2016) and the rate on the deposit facility (which stood at -0.4%) applicable at the time of take-up if they exceed their benchmark stock of eligible loans by 2.5% in total as of 31 January 2018.

The previous pricing scheme implies that the decrease in lending given to bond issuers after the announcement of the CSPP could have an impact on the effective borrowing rate for those banks that were financing themselves through the TLTRO and, hence, on their lending incentives. To explore this possibility, we investigate empirically whether banks relying more on TLTRO increased their lending to non-issuing firms to a higher extent than banks less dependent on TLTRO funding, for a given decrease in the flow of loans to issuing firms after the CSPP. Considering two hypothetical banks that have both experienced high credit outflows from bond issuers, one of which has used up 50% of its TLTRO limit, while the other has not taken up TLTRO funds, we find that the former bank would increase its credit to a given firm on average by 15% after the announcement of the CSPP, whereas in the latter case this increase would be just 7%. Hence, the reallocation of credit documented above was amplified by the ECB's TLTRO-II.

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FISCAL POLICIES IN THE EURO AREA: REVISITING THE SIZE OF SPILLOVERS

MARIO ALLOZA, PABLO BURRIEL, AND JAVIER PÉREZ

FORTHCOMING WORKING PAPER

Introduction

In a monetary union like the euro area (EA), with a common monetary policy but no area-wide fiscal authority, when monetary policy is constrained one of the few stabilization tools available is a coordinated fiscal stimulus. To properly assess the usefulness of this instrument, it is essential to understand how fiscal policy shocks in a given member country affect neighbouring countries.

We estimate these fiscal spillover effects using a novel country-level fiscal dataset with detailed information on both public revenues and expenditures. Given the scarcity of publicly available detailed historical fiscal data, we assemble a quarterly dataset for the four largest EA countries (Germany, France, Italy and Spain) and the euro area aggregate for the period 1980q1-2015q4. This updates existing data for Spain and the euro area that was developed using the same methodology discussed here, and merges it with newly created data for Germany and Italy.¹ We use an unobserved components methodology to extend quarterly National Accounts (ESA2010) fiscal data backwards, by combining annual national accounts and monthly budgetary accounts data.

Using these data, we estimate a vector autoregression (VAR) for each of the four major euro area countries. To identify government spending shocks, we impose restrictions on the contemporaneous response of the variables following Blanchard and Perotti (2002). We then use the identified shocks to explore the dynamic effects of fiscal changes in the major euro area countries via local projections (Jordá, 2005) both on the country that implements the policy (i.e. the conventional fiscal multiplier) and on neighbouring countries (fiscal spillovers).

To understand the cross-border effects, we calculate two statistics. First, the *fiscal spillover by destination* measures the increase in output in one country resulting from increases in government spending in the rest of countries. Second, the *fiscal spillover by origin* measures the degree of spillovers that each major economy is able to produce. The results suggest

that fiscal spillovers have positive effects on the economic activity in the euro area, especially in the case of public investment, which has important implications for the design of coordinated fiscal policies.

Data

Most of the empirical exercises on fiscal policies in the US rely on the existence of long quarterly datasets that document official aggregates since the end of World War II.² In contrast, in Europe, many of the corresponding fiscal variables are only available at quarterly frequency from the mid-to-late 1990s.

To address this issue we assemble a new dataset for Germany, France, Italy, Spain, and the euro area from 1980q1 to 2015q4 at quarterly frequency. This dataset is consistent with Eurostat's figures in their newest accounting framework (ESA2010). For Germany and Italy we combine official information from the quarterly non-financial accounts for general government statistics (ESA2010 and ESA95) and extend it backwards using intra-annual monthly fiscal information and annual official statistics. In particular, we set up an unobserved components model that combines both annual and quarterly national accounts and monthly indicators, enabling us to estimate fiscal variables at a quarterly frequency while maintaining coherence with the official annual aggregates. Our framework allows us to take into account important features of the data, such as different seasonal patterns.

For the cases of Spain and the EU, we obtain our data from updated versions of de Castro et al. (2017), and Paredes et al. (2014), respectively, which were constructed according to the methodology described above and are also consistent with national accounts. Lastly, data for France are obtained directly from Eurostat.

The resulting dataset contains disaggregated measures of fiscal revenues and spending for each of the four countries and the euro area aggregate. On the revenues side, the database includes an aggregate measure

¹ Paredes et al. (2014) elaborated a database for the EA aggregate. France is the only major EA country with official National Accounts data from 1980q1 (available in Eurostat).

² See Blanchard and Perotti (2002) and Ramey (2011), for example.

of total revenues, and distinguishes between direct and indirect taxation and social security contributions. Likewise, the variables on the spending side include a broad category of total expenditures, which breaks down into measures of government consumption (disaggregated into compensation of employees and other government consumption), government investment, social payments, subsidies and interest payments.

The availability of a detailed dataset is essential for the purpose of this analysis, since the standard definition of government spending used in the literature (Blanchard and Perotti, 2002) includes only total purchases of goods and services, that is, the sum of government consumption and government investment. Similarly, net tax revenues are defined as the sum of total revenues minus total transfers, which are defined as the sum of social payments and subsidies. Additional variables included in the analysis are real output, the output deflator and the 10-year interest rate. Nominal variables are converted to real terms using the GDP deflator. All series except the interest rate are seasonally adjusted.

Methodology

We next describe how we identify the fiscal shocks that we will later use to analyse the empirical effects of fiscal policies in the euro area. For each country, we separately estimate the following quarterly VAR:

$$X_t = B(L) X_{t-1} + e_t$$

where X_t is a vector containing the logs of real net tax revenues, government spending (defined as the sum of government consumption and government investment), output, the GDP deflator and the level of the 10-year interest rate. $B(L)$ is a lag polynomial of order $P=4$. We assume that the vector of residuals e_t contains a linear combination of structural shocks ε_t given by $A_0 e_t = \varepsilon_t$, where A_0 is a contemporaneous-response matrix that maps reduced-form residuals into structural shocks, which represent our object of interest. Following Blanchard and Perotti (2002), the reduced-form shocks of the tax revenues and government spending equations can be considered linear combinations of three components: i) the automatic response of fiscal variables to unexpected changes in the rest of the system (e.g. automatic stabilizers), ii) systematic discretionary responses of policy makers to unexpected changes in output, prices and interest rates (for instance, increases in government spending or reductions in tax liabilities

that authorities implement in the wake of a recession, and iii) random discretionary shocks, which represent the structural, economically-meaningful shocks that we are interested in. The role of the identification strategy is to impose sufficient conditions so the last of these objects can be recovered. The main identifying assumption is that it takes longer than a quarter to implement fiscal policies in response to an innovation in the economic environment. Hence, the use of quarterly data eliminates the possibility of contemporaneous discretionary responses.

In order to estimate the impact of government spending and tax shocks on economic activity, we compute impulse response functions following the local projections method of Jordá (2005). In particular, we estimate a series of single equations over the horizon h using:

$$\frac{y_{i,t+h} - y_{i,t-1}}{y_{i,t-1}} = \alpha_{i,h} + \beta_{i,j,h} \frac{shock_{j,t}}{y_{i,t-1}} + \delta_{i,h}(L) x_{i,t-1} + \zeta_{i,t+h}$$

$$\frac{g_{j,t+h} - g_{j,t-1}}{y_{i,t-1}} = \lambda_{i,h} + \gamma_{i,j,h} \frac{shock_{j,t}}{y_{i,t-1}} + \rho_{i,h}(L) x_{i,t-1} + u_{i,t+h}$$

where $y_{i,t}$ represents output in country i , $g_{j,t}$ government spending in country j , and $shock_{j,t}$ is the structural government spending shock identified above. Also, $x_{i,t-1}$ is a vector of controls containing lags of government spending, output and tax revenues. The cumulative sequence of $\beta_{i,j,h}$ for different time horizons h represents the response of output in country i to a fiscal shock in country j . We compute the government spending multipliers as the ratio of the sum of coefficients $\beta_{i,j,h}$ in the output equation by the corresponding coefficients in the government spending equation.³

When considering only one country ($i=j$), the equations above estimate the traditional domestic fiscal multiplier, that is, the variation in output in euros resulting from raising government spending by one euro. The results (Table 1) show that by the second year, all the spending multipliers exceed one (although not significantly in the case of France). These results, in line with previous findings in the literature, support the existence of important dynamic effects of expansionary government spending.⁴

³ The iterative nature of the local projections method introduces serial correlation in the residual $\zeta_{i,t+h}$; therefore we use the Newey-West (HAC) correction method to compute the standard errors.

⁴ For a comparison of national fiscal multipliers see, for example, European Commission (2012).

DOMESTIC GOVERNMENT SPENDING MULTIPLIERS

TABLE 1

	DE	FR	IT	ES	EA
impact	0.97**	0.37**	-0.1	0.47**	0.33*
1 year	0.89**	0.4	0.60**	1.06**	1.01**
2 years	1.39**	1.1	1.09**	1.36**	1.09*
3 years	1.79**	1.7	1.24**	1.23**	0.64

NOTE: One and two asterisks indicate that the point estimate lies within one or two standard errors respectively.

When considering cross-border effects ($i \neq j$), the equations above estimate the spillover multiplier, i.e. how much a fiscal policy in one country can affect output in a different country. In order to describe the aggregate degree of fiscal spillovers present in the euro area, we propose two alternative statistics to summarise the information in the above equations. First, we compute a measure of how much one country benefits from simultaneous fiscal shocks in the rest of the countries, which we call spillovers by destination or $spillover^D$.

In particular, this object measures the impact on the output of country i from shocks originated in the other countries $j \neq i$ under consideration. This statistic is our preferred specification to determine the existence of spillovers in the euro area. We construct it as the ratio of the sum of the total impact of the fiscal actions in countries $j \neq i$ on the output of country i , and the sum of the effect of the same policies in the government spending of all countries $j \neq i$:

$$spillover^D_{i,h} = \frac{\sum_{j \neq i} \sum_{r=0}^h \beta_{i,j,r}}{\sum_{j \neq i} \sum_{r=0}^h \gamma_{i,j,r}} = \sum_{j \neq i} M_{i,j,h} \frac{\Gamma_{i,j,h}}{\sum_{k \neq i} \Gamma_{i,k,h}}$$

where $M_{i,j,h}$ is our definition of the cumulative multiplier of government spending spillover of country j on country i in time horizon h and $\Gamma_{i,j,h} = \sum_{r=1}^h I \gamma_{i,j,r}$. Intuitively, the above equations weight the cross-country multipliers $M_{i,j,h}$ by the size of the increase in government spending in country j as a share of the total increase in government spending from countries $i \neq j$.⁵

Second, we estimate the size of the spillovers that each individual country is able to generate. We refer to this as *spillovers by origin*, or $spillover^O$. This statistic traces

⁵ The object measured by $spillover^D$ is the response to a simultaneous increase of one euro in the rest of the considered countries, which results from adding the effect of different fiscal shocks at the same moment of time (i.e. the sum of coefficients $\beta_{i,j,r} \forall i \neq j$). Hence, our results for this specifications are likely to represent an upper bound.

the impact of an exogenous government spending shock originated in country j on the output of the remaining countries $i \neq j$. We construct it by taking an output-weighted average of the cross-country spillovers that country j generates on the remaining countries ($i \neq j$) employing the coefficients estimated before:

$$spillover^O_{j,h} = \sum_{i \neq j} \frac{\sum_{r=0}^h \beta_{i,j,r}}{\sum_{r=0}^h \gamma_{i,j,r}} \omega_i = \sum_{i \neq j} M_{i,j,h} \omega_i$$

where $\omega_i = \frac{Y_i}{\sum_{k \neq j} Y_k}$ are the GDP weights. Basically, $spillover^O$ represents an average effect of a shock in country j on countries $i \neq j$, with the weights determined by relative size of the economy receiving the shock.

Results

The cumulative multipliers on each of the four countries considered, after a simultaneous increase in government spending in the other countries (i.e. $spillover^D$) are shown in Panel A of Table 2. Additionally, Figure 1 shows the dynamic response of output, that is, the sequence of coefficients $\beta_{i,j,r}$ in the $spillover^D$ equation.⁶ The results suggest that there exist positive spillovers in Germany, France and Spain, although with differences in dynamics and magnitude. France and Spain show a similar pattern, with the spillover becoming positive and significant by the end of the first year, with a cumulative effect peaking in the third year, with a multiplier of approximately 1. Germany also shows an increasing positive pattern of the fiscal spillover, but with significant values at 68% only in the third year.⁷ The magnitude of the effect in Germany seems to be bigger than in the rest of the countries considered, which suggests a special sensitivity of this country to foreign fiscal actions.⁸ If we take the output-weighted average of the results in Panel A we have an approximate measure of an average spillover effect of a simultaneous increase in government spending in the euro area, which would amount to 0.36, 0.97 and 1.46 in the first, second and third year, respectively.

Next, in Panel B of Table 2 we explore the spillover by origin ($spillover^O$), that is, the average effect of a fiscal

⁶ Figure 1 shows the point estimates of $\beta_{i,j,r}$ in a solid black line. The grey lines plot the Newey-West confidence bands at levels of 68% (solid grey lines) and 95% (dashed grey lines).

⁷ The spillover in the second year of 1.7 is significant at the 67% level, not shown in the table.

⁸ However, the uncertainty surrounding the estimation does not support the existence of significantly different spillovers across countries.

FISCAL SPILLOVERS FROM GOVERNMENT SPENDING

TABLE 2

RESPONSE OF OUTPUT IN A COUNTRY TO AN INCREASE IN GOVERNMENT SPENDING IN THE OTHER COUNTRIES

FIGURE 1

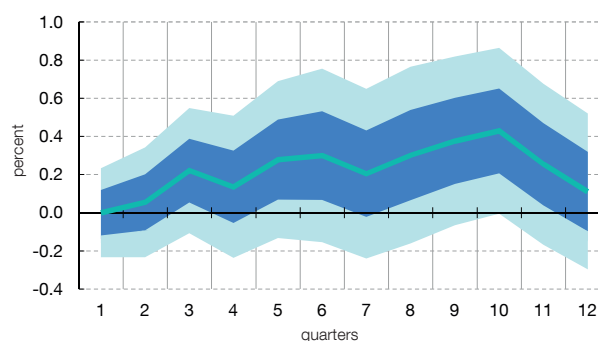
	DE	FR	IT	ES
Panel A: total gov. spending (by destination)				
impact	0.00	0.05	-0.07	0.07
1 year	0.63	0.31*	0.07	0.24*
2 years	1.72	0.72*	0.16	0.61*
3 years	2.80*	1.03*	-0.13	1.00*
Panel B: total gov. spending (by origin)				
impact	0.00	0.11	-0.06	0.05
1 year	0.21*	-0.22	0.40	0.83*
2 years	0.47*	0.97	0.89*	1.57*
3 years	0.58**	3.62	1.31*	2.11*
Panel C: public consumption (by origin)				
impact	0.01	-0.07	0.10	0.16
1 year	0.25*	-0.86	0.67*	0.65
2 years	0.58*	-1.39	0.98	1.23
3 years	0.77	-1.00	1.42	2.12
Panel D: public investment (by origin)				
impact	0.18	1.23*	-0.01	-0.25
1 year	0.90*	0.99	0.92*	1.36
2 years	1.94*	2.62*	2.19*	1.93
3 years	1.85*	3.37*	3.06*	7.67
Panel E: exports (by destination)				
impact	0.12	0.01	-0.02	-0.01
1 year	0.90*	0.28*	0.04	0.09
2 years	2.31*	0.62*	0.12	0.31*
3 years	3.68*	0.80*	0.13	0.44*
Panel F: total gov. spending (trade-weighted)				
impact	-0.19	0.02	-0.11	0.04*
1 year	0.00	0.25*	-0.03	0.17**
2 years	0.73	0.50**	0.00	0.32**
3 years	1.16*	0.59**	-0.28	0.40**

NOTE: One and two asterisks indicates that the point estimate is significantly different from zero at the one or two standard errors level, respectively.

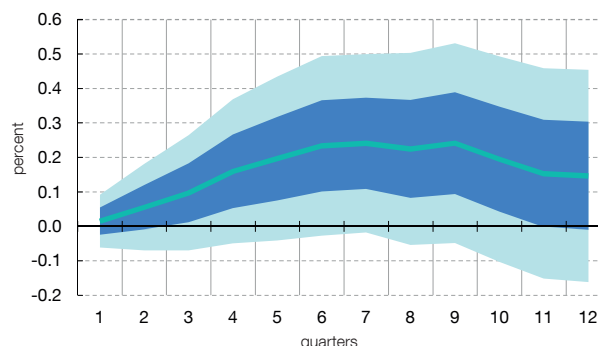
action in one country on the economic activity of the others. The results suggest that all countries generate large and positive spillovers after the second year, although the estimates for France are not significant. In all cases, the effect takes at least one quarter to build in. Germany shows a positive and significant multiplier on the other countries of 0.21 in the first year, rising to 0.6 in the third year. Italy and Spain also show significant and larger spillover effects: the multiplier in the second year is estimated to be around 0.9 and 1.6, rising to 1.3 and 2.1 in the third years, respectively. All in all, Panels A and B in Table 2 provide evidence of positive fiscal spillovers across the major euro area economies.

We also analyse the spillover effects derived from individual components of government spending (see panels C and D in Table 2). Our findings suggest that

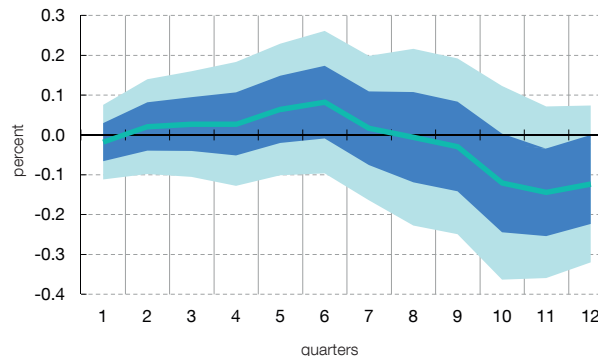
DE - GDP RESPONSE



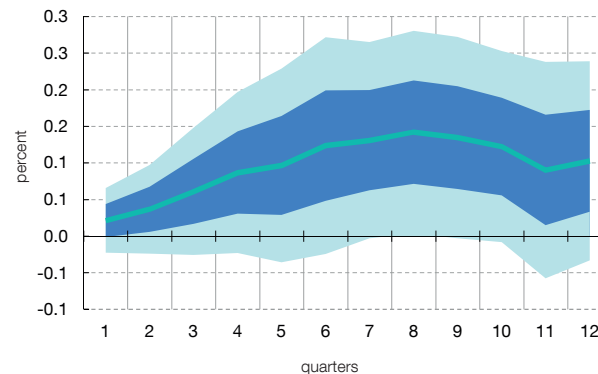
FR - GDP RESPONSE



IT - GDP RESPONSE

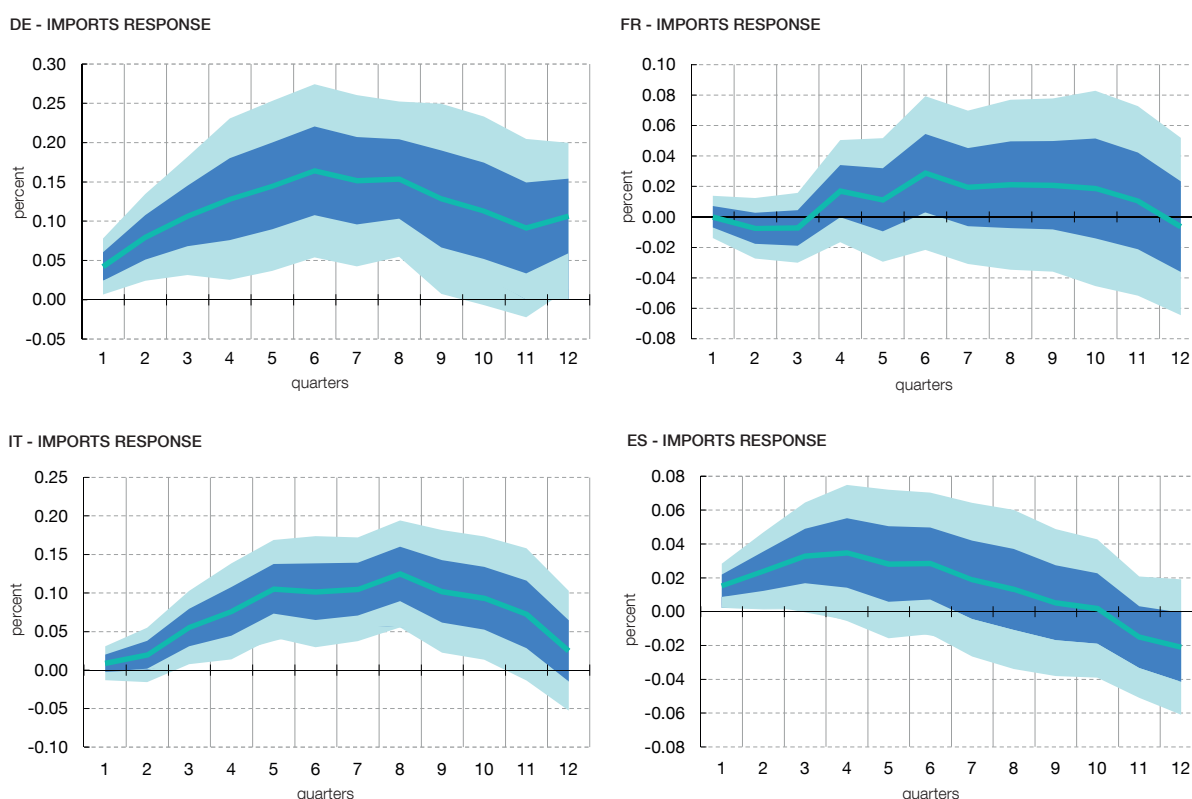


ES - GDP RESPONSE



NOTE: The point estimates are shown as solid green lines. The shaded areas plot the Newey-West confidence bands at levels of 68% (dark blue) and 95% (light blue).

RESPONSE OF DOMESTIC IMPORTS TO AN INCREASE IN GOVERNMENT SPENDING IN THE SAME COUNTRY FIGURE 2



NOTE: The point estimates are shown as solid green lines. The shaded areas plot the Newey-West confidence bands at levels of 68% (dark blue) and 95% (light blue).

public investment tends to generate higher spillovers than public consumption. In the case of spillovers by origin, the multipliers of public investment come close to two by the end of the second year.⁹ This evidence has important policy implications, since it suggests that fiscal actions based on increases in public investment are likely to help stimulate activity in other euro area countries.

Trade relationships represent a potential explanation for the observed domestic economic responses to foreign fiscal policies: an increase in government spending in one country may stimulate its domestic demand and hence trigger the exports of trading partners.¹⁰ Several lines of evidence support this interpretation.

⁹ When looking at the effect of spillovers by destination, all countries but Italy show large and significant effects from the first year onwards, greater than those of public consumption.

¹⁰ A more direct channel would be related to the import content of government spending in countries that originate fiscal shocks. In this case, increases in public consumption or investment reflect direct increases in imports from their neighbours. For example, this could be the case of a public infrastructure project that requires equipment imported from another euro area country. We find evidence that countries with higher import content tend to generate higher spillovers.

First, we find evidence that domestic imports increase after an exogenous government spending shock. Figure 2 shows that imports in Germany, Italy and Spain (less clearly in the case of France) react positively and significantly to increases in government spending. Then, we compute the destination spillover (*spillover^D*) as explained above, but substituting the dependent variable by exports (instead of output). This statistic allows us to analyse whether a country sees an increase in its exports after a simultaneous expansionary fiscal policy by its neighbors.

Panel E in Table 2 shows the export multipliers in each country when the others have embarked on simultaneous expansionary policies. The results support the trade channel described above: countries which experience positive spillovers also benefit from positive, large and significant increases in exports. For example, we observe a large and significant increase in exports in Germany from the first year onwards, which according to Panel A seems to be a country that also experiences large fiscal spillovers. France and Spain also show increases in exports as a result of foreign fiscal expansions, peaking in the third year. Italy, for which we could not find a significant evidence of from fiscal spillovers, does not seem to experience an increase in exports.

How do our results on fiscal spillovers relate to previous findings? To make this comparison possible, we adapt the methodology described above by aggregating the structural government spending shocks $\varepsilon_{j,t}^G$ into a single variable using trade weights ω_{ij} and previous-period spending $G_{j,t-1}$:

$$shock_{i,t} = \sum_{j \neq i} \omega_{ij} \varepsilon_{j,t}^G G_{j,t-1}$$

The variable $shock_{i,t}$ represents a measure of spillovers that allows us to estimate the impact on output of country i of an average shock in the other countries (as opposed to a simultaneous shock described by *spillover^D*). This framework, adapted from Auerbach and Gorodnichenko (2013), is efficient under the assumption that the trade weights perfectly capture the transmission channel of the fiscal shock across countries. However, it ignores potential heterogeneity in the origin of the shock since it only recovers an average impact parameter.

Spillovers estimated under this new framework are reported in Panel F of Table 2. As expected, the spillovers are somewhat smaller than those reported in Panel A of Table 2, falling to roughly half the size. Reassuringly, the dynamic patterns and relative size across countries remain similar between both specifications. Taking into account the relative size of each economy considered here, the average effect (in terms of the cumulative multiplier) of a trade-weighted shock in these countries would be of around 0.09, 0.46, and 0.60 in the first, second and third year respectively. These results are broadly in the same order of magnitude as some previous empirical work. For example, our average multiplier for the third year of 0.6 is methodologically comparable to Auerbach and Gorodnichenko (2013), who found this figure to be between 1.6-2.0, depending on the precise specification (with standard errors of 1 or higher). For a sample of OECD countries, Goujard (2016) also finds large effects: the average impact in the first year of a trade-weighted fiscal consolidation based on spending cuts of 1% of GDP, reduces output growth in the destination of an average OECD country by around 2.0-2.7 percentage points in the medium term (3 years).¹¹

¹¹ Other empirical work finds, however, smaller spillover effects: Beetsma et al. (2006) find that a 1-percent of German GDP shock to government spending results in an average response of GDP of the other EU countries of about 0.15 after two years. The same shock in France has an effect of around 0.8.

Conclusions

Our results suggest that fiscal spillovers are present in the euro area, implying that fiscal policies are likely to have cross-border effects on neighbouring countries. We find evidence of a trade channel explaining these effects, which also suggests that trade policies may impact the international transmission mechanisms of fiscal actions. Our results highlight the importance of public investment in generating spillovers. This has direct policy implications, suggesting that expansions of public investment amongst the euro members are likely to be the fiscal instrument that generates the highest cross-border effects.

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WORKING PAPER N° 1719

During economic downturns, weak domestic demand developments seem to be an additional driver of

exports, as firms increase their efforts to serve markets abroad to compensate the fall in domestic sales. This may constitute an additional mechanism of adjustment for the euro area countries where real exchange rate variations are limited by the common currency itself and the present low inflation environment. However, this substitution effect between domestic and foreign sales could be different across euro area members. This paper uses panel data techniques to assess the role of the export structure in explaining these differences. Building a novel indicator for product concentration, the results suggest that domestic demand developments are more relevant to explain exports in countries with a lower product concentration index (that is, more diversified exports). This contributes to explain why euro area countries under stress registered different economic performance during the most recent years.

A MENU ON OUTPUT GAP ESTIMATION METHODS

LUIS J. ÁLVAREZ AND ANA GÓMEZ-LOSCOS

WORKING PAPER N° 1720

This paper presents a survey of output gap modeling techniques, which are of special interest for policy making institutions. We distinguish between univariate – which estimate trend output on the basis of actual output, without taking into account the information contained in other variables – and multivariate methods – which incorporate useful information on some other variables, based on economic theory. We present the main advantages and drawbacks of the different methods.

THE OUTPUT EFFECTS OF TAX CHANGES: NARRATIVE EVIDENCE FROM SPAIN

PAULA GIL, FRANCISCO MARTÍ, JAVIER J. PÉREZ, ROBERTO RAMOS AND RICHARD MORRIS

WORKING PAPER N° 1721

This paper estimates the GDP impact of legislated tax changes in Spain using a newly constructed narrative record for the period 1986-2015. Our baseline estimates suggest that a 1% of GDP increase in exogenous taxes depresses output by around 1.3% after one year, this negative effect fading away at more distant horizons. We also find that the effect of changes in indirect taxes are larger and that, following a tax increase, investment reacts more than consumption. Overall, our set of estimates is consistent with negative output effects triggered by tax increases, yet the quantitative effects are subject to non-negligible uncertainty that is reflected in wide confidence bands, in line with the extant literature for other countries.

THE EUROZONE (EXPECTED) INFLATION: AN OPTION'S EYES VIEW

RICARDO GIMENO AND ALFREDO IBÁÑEZ

WORKING PAPER N° 1722

We estimate inflation risk-neutral densities (RNDs) in the Euro area since 2009. We use Euro inflation swaps and caps/floors options, and introduce a simple and parsimonious approach to jointly estimate the RNDs across horizons. This way, we obtain the implicit RND for forward measures, like the five-on-five years inflation rate, which, although it is not directly traded in the market, is a key rate for monetary policy. Then, we discuss several indicators derived from the information content of the historical RNDs that are useful for monetary policy and compare them in the light of the ECB's decisions and communication over the last few years. Specifically, the evolution of tails risks (associated with deflation and high inflation); the balance of inflation risks; measures of risk aversion from the ECB's Survey of Professional Forecasters (SPF); and how forward inflation rates react to the ECB's non-conventional monetary policies [Longer Term Refinancing Operations, (LTRO), Securities Market Programme, (SMP), Asset Purchase Programme, APP, and its variants and extensions].

DEALING WITH DEALERS: SOVEREIGN CDS COMOVEMENTS

MIGUEL ANTÓN, SERGIO MAYORDOMO

AND MARÍA RODRÍGUEZ-MORENO

WORKING PAPER N° 1723

We show that sovereign CDS that have common dealers tend to be more correlated, especially when the dealers display similar quoting activity in those contracts over time. This commonality in dealers' activity is a powerful driver of CDS comovements, over and above fundamental similarities between countries, including default, liquidity, and macro factors. We posit that the mechanism causing the excess correlation is the buying pressure faced by CDS dealers for credit enhancements and regulatory capital reliefs. An instrumental variable analysis confirms that our findings are indeed rooted in a causal relationship.

PRICING DECISIONS UNDER FINANCIAL FRICTIONS: EVIDENCE FROM THE WDN SURVEY

JOSÉ MANUEL MONTERO

WORKING PAPER N° 1724

I test the predictions from Duca, Montero, Riggi and Zizza (2017), who develop a customer-market model with consumer switching costs and capital-market

imperfections in which price-cost markups behave countercyclically, with a subsample of European firms participating in the Wage Dynamics Network 2014 survey. I use a novel empirical approach developed by Aakvik, Heckman and Vytlačil (2005) for estimating discrete choice models with binary endogenous regressors that allows for selection on unobservables. Results show that firms subject to financial constraints had a significantly higher probability of raising markups than in a counterfactual scenario without such constraints. Moreover, the estimated partial effects for the main variables are in overall accordance with the predictions from the theoretical model.

THE IMPACT OF TAXES ON INCOME MOBILITY

MARIO ALLOZA

WORKING PAPER N° 1725

This paper investigates how taxes affect relative mobility in the income distribution in the US. Household panel data drawn from the PSID between 1967 and 1996 are employed to analyse the relationship between marginal tax rates and the probability of staying in the same income decile. Exogenous variation in marginal tax rates is identified by using counterfactual rates based on legislated changes in the tax schedule. I find that higher marginal tax rates reduce income mobility. An increase in one percentage point in marginal tax rates causes a decline of around 0.8 percentage points in the probability of changing to a different income decile. Tax reforms that reduce marginal rates by 7 percentage points are estimated to account for around a tenth of the average movements in the income distribution in a year. Additional results suggest that the effect of taxes on income mobility differs according to the level of human capital and that it is particularly significant when considering mobility at the bottom of the distribution.

MEASURING BUSINESS CYCLES INTRA-SYNCHRONIZATION IN US: A REGIME-SWITCHING INTERDEPENDENCE FRAMEWORK

DANILO LEIVA-LEON

WORKING PAPER N° 1726

This paper proposes a Markov-switching framework to endogenously identify periods where economies are more likely to (i) synchronously enter recessionary and expansionary phases, and (ii) follow independent business cycles. The reliability of the framework is validated with simulated data in Monte Carlo experiments. The framework is applied to assess the time-varying intra-country synchronization in the US. The main results report substantial changes over time

in the cyclical affiliation patterns of US states, and show that the more similar the economic structures of states, the higher the correlation between their business cycles. A synchronization-based network analysis discloses a change in the propagation pattern of aggregate contractionary shocks across states, suggesting that the US has become more internally synchronized since the early 1990s.

MODEL AVERAGING IN MARKOV-SWITCHING MODELS: PREDICTING NATIONAL RECESSIONS WITH REGIONAL DATA

PIERRE GUÉRIN AND DANILO LEIVA-LEON

WORKING PAPER N° 1727

This paper introduces new weighting schemes for model averaging when one is interested in combining discrete forecasts from competing Markov-switching models. In the empirical application, we forecast U.S. business cycle turning points with state-level employment data. We find that forecasts obtained with our best combination scheme provide timely updates of U.S. recessions in that they outperform a notoriously difficult benchmark to beat (the anxious index from the Survey of Professional Forecasters) for short-term forecasts.

THE PROPAGATION OF INDUSTRIAL BUSINESS CYCLES

MAXIMO CAMACHO AND DANILO LEIVA-LEON

WORKING PAPER N° 1728

This paper examines the evolution of the distribution of industry-specific business cycle linkages, which are modelled through a multivariate Markov-switching model and estimated by Gibbs sampling. Using non-parametric density estimation approaches, we find that the number and location of modes in the distribution of industrial dissimilarities change over the business cycle. There is a relatively stable trimodal pattern during expansionary and recessionary phases characterized by highly, moderately and lowly synchronized industries. However, during phase changes, the density mass spreads from moderately synchronized industries to lowly synchronized industries. This agrees with a sequential transmission of the industrial business cycle dynamics.

COSTLY DECISIONS AND SEQUENTIAL BARGAINING

JAMES COSTAIN

WORKING PAPER N° 1729

This paper models a near-rational agent who chooses from a set of feasible alternatives, subject to a cost

function for precise decision-making. Unlike previous papers in the “control costs” tradition, here the cost of decisions is explicitly interpreted in terms of time. That is, by choosing more slowly, the decision-maker can achieve greater accuracy. Moreover, the timing of the choice is itself also treated as a costly decision.

A tradeoff between the precision and the speed of choice becomes especially interesting in a strategic situation, where each decision maker must react to the choices of others. Here, the model of costly choice is applied to a sequential bargaining game. The game closely resembles that of Perry and Reny (1993), in which making an offer, or reacting to an offer, requires a positive amount of time. But whereas Perry and Reny treat the decision time as an exogenous fixed cost, here we allow the decision-maker to vary precision by choosing more or less quickly, thus endogenizing the order and timing of offers and responses in the game.

Numerical simulations of bargaining equilibria closely resemble those of the Binmore, Rubinstein, and Wolinsky (1983) framework, except that the time to reach agreement is nonzero and offers are sometimes rejected. In contrast to the model of Perry and Reny, our numerical results indicate that equilibrium is unique when the space of possible offers is sufficiently finely spaced.

IS FISCAL POLICY MORE EFFECTIVE IN UNCERTAIN TIMES OR DURING RECESSIONS?

MARIO ALLOZA

WORKING PAPER N° 1730

This paper estimates the impact of government spending shocks on economic activity during periods of high and low uncertainty and during periods of boom and recession. We find that government spending shocks have larger impacts on output in booms than in recessions and larger impacts during tranquil times than during uncertain times. The results suggest that confidence plays an important role in explaining this differential impact.

MONETARY POLICY, STOCK MARKET AND SECTORAL COMOVEMENT

PIERRE GUÉRIN AND DANILO LEIVA-LEON

WORKING PAPER N° 1731

This paper evaluates the role that sectoral comovement plays in the propagation of monetary policy shocks on the stock market. In doing so, we introduce a factor-augmented vector autoregressive model with heterogeneous regime-switching factor loadings,

denoted as MS2-FAVAR, that allows us to jointly assess (i) potential changes in the degree of comovement between each sector-specific stock return and the aggregate stock market as well as (ii) the propagation of monetary policy shocks taking into account such changes in comovement. We find that the effects of monetary policy shocks on stock returns are substantially amplified when industries experience a stronger degree of comovement, suggesting that a more interconnected stock market is more prone to the propagation of monetary policy shocks. The MS2-FAVAR model is also well-suited to perform a network analysis to characterize linkages in large datasets.

LEVERAGE AND DEEPENING BUSINESS CYCLE SKEWNESS

HENRIK JENSEN, IVAN PETRELLA, SØREN HOVE RAVN

AND EMILIANO SANTORO

WORKING PAPER N° 1732

We document that the U.S. economy has been characterized by an increasingly negative business cycle asymmetry over the last three decades. This finding can be explained by the concurrent increase in the financial leverage of households and firms. To support this view, we devise and estimate a dynamic general equilibrium model with collateralized borrowing and occasionally binding credit constraints. Higher leverage increases the likelihood that constraints become slack in the face of expansionary shocks, while contractionary shocks are further amplified due to binding constraints. As a result, booms become progressively smoother and more prolonged than busts. We are therefore able to reconcile a more negatively skewed business cycle with the Great Moderation in cyclical volatility. Finally, in line with recent empirical evidence, financially-driven expansions lead to deeper contractions, as compared with equally-sized non-financial expansions.

EXTERNAL STRESS EARLY WARNING INDICATORS

CÉSAR MARTÍN MACHUCA

WORKING PAPER N° 1733

We examine the determinants of external stress episodes through probit analysis, focusing on the role of foreign liabilities in order to build an external crisis early warning indicator for a set of selected EMU countries. We use a panel country data spanning 1970-2011 from External Wealth Dataset (Phillip Lane). Our results show that the ratio of net and gross foreign liabilities to GDP and current account balances — which measure external debt accumulation speed — are significant stress predictors, although (net) FDI liabilities seem an

offset factor. Early warning indicators are based on a signalling approach and exploit panel dimension of the data to develop a country specific indicator. We find that EMU peripheral countries' external indebtedness remains higher than risk threshold, in spite of the external adjustment accumulated in the last years in some countries. This result highlights the necessity of going on structural reforms that reinforce competitiveness of these economies.

INTERNATIONAL MIGRATION PRESSURES IN THE LONG RUN

RODOLFO G. CAMPOS

WORKING PAPER N° 1734

Using an empirical gravity model, I estimate the contribution of changes in relative labor supply to bilateral migration in the 2000s and apply the resulting estimates to project future bilateral flows based on population forecasts by the United Nations. I extend the work of Hanson and McIntosh (2016) by including non-OECD destinations and project international migration flows for the whole world. In contrast to their findings, and despite of the slowdown of population growth in Latin America, the US will face sustained immigration pressures because of strong population growth in other regions of the world, leading to a projected immigrant stock that grows for decades to come. For the world as a whole, international migrants are projected to increase from 2.8% of total world population in 2010 to 3.5% in 2050, with a substantial increase of migrants originating from India and Sub-Saharan Africa.

FIRM HETEROGENEITY AND AGGREGATE BUSINESS SERVICES EXPORTS: MICRO EVIDENCE FROM BELGIUM, FRANCE, GERMANY AND SPAIN

ANDREA ARIU, ELENA BIEWEN, SVEN BLANK, GUILLAUME GAULIER, MARÍA JESÚS GONZÁLEZ, PHILIPP MEINEN, DANIEL MIRZA, CÉSAR MARTÍN MACHUCA AND PATRY TELLO

WORKING PAPER N° 1735

This paper uses detailed micro data on service exports at the firm-destination-service level to analyse the role of firm heterogeneity in shaping aggregate service exports in Belgium, France, Germany and Spain from 2003 to 2007. We decompose the level and the growth of aggregate service exports into different trade margins paying special attention to firm heterogeneity within countries. We find that the weak export growth of France is at least partly due to poor performance by small exporters. By contrast, small exporters are the most dynamic contributors to the aggregate exports of Belgium, Germany and Spain. Our results highlight the

importance of firm heterogeneity in understanding aggregate export growth.

CHANGING BUSINESS MODELS IN INTERNATIONAL BANK FUNDING

LEONARDO GAMBACORTA, STEFANO SCHIAFFI AND ADRIAN VAN RIXTEL

WORKING PAPER N° 1736

This paper investigates the foreign funding mix of globally active banks. Using BIS international banking statistics for a panel of 12 advanced economies, we detect a structural break in international bank funding at the onset of the great financial crisis. In their post-break business model, banks rely less on cross-border liabilities and, instead, tap funds from outside their jurisdictions by making more active use of their subsidiaries and branches, as well as inter-office accounts within the same banking group.

AN ANATOMY OF THE SPANISH CURRENT ACCOUNT ADJUSTMENT: THE ROLE OF PERMANENT AND TRANSITORY FACTORS

ENRIQUE MORAL-BENITO AND FRANCESCA VIANI

WORKING PAPER N° 1737

This paper aims to identify how much of the recent current account adjustment in Spain can be explained by cyclical factors. For this purpose, we consider the cross-country regressions in the IMF's External Balance Assessment (EBA) methodology but allowing for country-specific slopes and intercepts. The good fit of these regressions implies negligible residuals for most countries, and, as a result, the positive analysis of current account decompositions provides a more informative assessment of the external balance drivers. According to our findings, around 60% of the 12 pp. adjustment of the Spanish external imbalance over the 2008-2015 period can be explained by transitory factors such as the output gap, the oil balance, and the financial cycle. The remaining 40% is explained by factors such as the cyclically-adjusted fiscal consolidation, population aging, lower growth expectations, or competitiveness gains, which can all be considered as more permanent phenomena.

CROSS-BORDER BANKING ON THE TWO SIDES OF THE ATLANTIC: DOES IT HAVE AN IMPACT ON BANK CRISIS MANAGEMENT?

MARÍA J. NIETO AND LARRY D. WALL

WORKING PAPER N° 1738

In the US and the EU political incentives to oppose cross-border banking have been strong in spite of the

measurable benefits to the real economy from breaking down geographic barriers. Even a federal level supervisor and safety net is not by itself sufficient to incentivizing crossborder banking although differences in the institutional set up are reflected in the way the two areas responded to the crisis. The US response was a coordinated response and the cost of resolving banks was borne at the national level. Moreover, the FDIC could market failed banks to other banks irrespective of state boundaries reducing the cost of the crisis to the US economy and the sovereign finances. In the EU, the crisis resulted in financial market fragmentation and unbearable costs to some sovereigns.

CURRENCY UNIONS AND HETEROGENEOUS TRADE EFFECTS: THE CASE OF THE LATIN MONETARY UNION

JACOPO TIMINI

WORKING PAPER N° 1739

The Latin Monetary Union (LMU) agreement signed in December 1865 by France, Italy, Belgium and Switzerland standardised gold and silver coinage in member countries and allowed free circulation of national coins in the Union. In his seminal study, Flandreau (2000) found no evidence of an overall positive effect of the LMU on trade. In this paper, I estimate the effects of this currency agreement on trade. In my gravity model I explicitly take into account the changing conditions in the international environment that affected the LMU's underlying economic foundations (i.e. the limits on silver coinage agreed upon in 1874) and its rules (i.e. the "liquidation clause" of 1885). I also test the existence of heterogeneous effects on bilateral trade within the LMU. In line with Flandreau, I find no significant LMU trade effects. However, I find support for the hypothesis that the LMU had significant trade effects for the period 1865-1874. These effects were nonetheless concentrated in trade flows between France and the rest of the LMU members, following a hub-and-spokes structure. Moreover, I find evidence for the existence of an 1874 "LMU-wide" structural break, which affected the course of trade flows within the Union.

SUBSIDISING MATURE AGE EMPLOYMENT OR THROWING COINS INTO A WISHING WELL: A QUASI-EXPERIMENTAL ANALYSIS?

PAULINO FONT, MARIO IZQUIERDO AND SERGIO PUENTE

WORKING PAPER N° 1740

This paper evaluates the effect that subsidies to employment maintenance have on the probability of mature age workers staying in the firm. Implementing

a quasi-experimental design provided by changes in Spanish labour market regulations, we are able to estimate that subsidy removal had a small though significant impact on the workers' firm attachment rate. Our results show that a 1 pp increase in the worker's cost translates into a 0.11 pp increase in the cumulative probability of the worker separating from the firm in the next five months. This effect was mainly driven by workers with relatively less seniority in the firm, who present lower dismissal costs, and by workers in low-skill jobs, for which the wage-productivity gap seems to negatively evolve with age. In terms of cost-benefit analysis, we document that the previous higher rate of job maintenance was achieved at a disproportionate cost, and therefore the elimination of the subsidy resulted in Social Security efficiency gains.

FINANCIAL STABILITY JOURNAL

The Financial Stability Journal (Revista de Estabilidad Financiera) is a half-yearly journal published by the Banco de España that aims to act as a platform for communication and dialogue regarding issues related to financial stability, with a particular focus on prudential regulation and supervision. Its board of editors comprises internal and external professionals. All articles appearing in the journal, which may be authored by Banco de España staff or researchers from other institutions, are refereed by at least one member of the board of editors.

FINANCIAL INNOVATION IN THE DIGITAL AGE: CHALLENGES FOR REGULATION AND SUPERVISION

JOSÉ MANUEL GONZÁLEZ-PÁRAMO

ESTABILIDAD FINANCIERA 32, MAY 2017, 9-38

This paper analyses the benefits and risks of the digitisation of finance. These risks stem chiefly from digital infrastructures, new business and distribution models and new customer solutions. The author considers that it is necessary to renew the regulatory and supervisory framework to address the new risks in terms of cyber security, consumer protection, operational continuity and fraud, among others. This framework should rest, at least, on four pillars: well-defined policies on the control and management of new technological risks in the financial sector; the launch of innovation hubs; the creation of supervised safer environments for market experimentation (regulatory sandboxes); and the acquisition of new digital skills and a collaborative mindset.

EXECUTIVE COMPENSATION AND FIRM LEVERAGE: A POLICY ORIENTED SURVEY

PEDRO GETE AND JUAN PEDRO GÓMEZ

ESTABILIDAD FINANCIERA 32, MAY 2017, 39-52

The authors analyse the recent literature on the connection between firms' leverage and executive compensation. To draw conclusions from a regulatory policy-making standpoint, they review the dynamics of pay-for-performance compensation and the existing literature on the relationship between firms' leverage and the structure of executive compensation. In particular, despite recent papers showing positive outcomes in the control of firms' leverage from regulation of executive compensation, the authors raise a cautionary note: under certain conditions, regulating leverage directly seems more efficient than regulating executive compensation.

EUROPEAN BANKS US DOLLAR LIABILITIES: BEYOND THE COVERED INTEREST PARITY

LUNA AZAHARA ROMO GONZÁLEZ

ESTABILIDAD FINANCIERA 32, MAY 2017, 53-74

This paper studies the determinants of dollar-denominated long-term debt issuance by euro area banks, with a particular focus on deviations from covered interest parity (CIP). The author finds evidence that the higher issuance of dollar-denominated debt by euro area banks represents a response to recent regulatory reforms (which have incentivised subordinated and long-term debt issuance) and to an interest in benefiting from the traditional depth and breadth of the dollar investor base (i.e. strategic issuance). The article concludes by analysing possible financial stability consequences of banks' reliance on dollar markets and, in particular, how the supply of dollars by non-bank entities, chiefly located in emerging economies, may pose risks to the global financial system.

REQUERIMIENTOS DE CAPITAL POR RIESGO DE CONTRAPARTIDA: EL NUEVO MÉTODO ESTÁNDAR

FRANCISCO MANZANO CARPIO

ESTABILIDAD FINANCIERA 32, MAY 2017, 75-93

This paper describes the new standardised approach for capital requirements for counterparty risk proposed by the Basel Committee on Banking Supervision, whose main aim is to mitigate the weaknesses identified in the previous standardised method: specifically, the lack of an appropriate recognition of the mitigating effects of collateral and

netting agreements. The author also describes the proposed regulatory transposition of this new approach at EU level and finalises the article with some personal considerations. In particular, he believes that the new proposed alternative will offer minimum capital requirement figures better tailored to the risks actually assumed and which will provide for cross-entity comparability. In addition, he raises a note of caution in connection with improving counterparty risk management practices; in particular, the importance of having appropriate collateral management policies at hand as a tool for aligning the interests of those with credit exposure in derivatives with those responsible for managing the ultimate underlying risk.

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NEWS AND EVENTS

NEWS

8th LLUÍS FINA PRIZE AWARDED TO RODOLFO CAMPOS

Banco de España economist **Rodolfo Campos**, of the ADG International Affairs, has been awarded the Eighth Lluís Fina Prize. This prize is granted every two years by the **Asociación Española de Economía del Trabajo** (the Spanish Labor Economics Association) for an academic article dealing with the Spanish or European labor market (see the [submission rules for the prize](#)). Rodolfo Campos was awarded the prize for the article prize, “**Consumption in the shadow of unemployment**”, co-authored with Iliana Reggio, published in the *European Economic Review*.

RECENT CONFERENCES

[LINK TO CONFERENCES PAGE](#)

HOW MUCH OF A FISCAL UNION FOR THE EMU?

MADRID, 18-19 MAY, 2017

On May 18-19, the ADEMU project and the Banco de España, in conjunction with the European Stability Mechanism and the International Monetary Fund, hosted a conference to examine the role of a fiscal union in the European Monetary Union (EMU).

During the conference, held at the Banco de España Madrid headquarters, **57 international economists, lawyers, social scientists and researchers presented research and findings on the need for a fiscal union, and discussed the future of the euro area.**

Participants discussed their own research alongside the European Commission’s current proposals for the EMU, detailed in its **White Paper on the Future of Europe**. In the paper, the EC analyses five possible outcomes: 1) carrying on; 2) nothing but the single market; 3) those who want more do more; 4) doing less more efficiently, and 5) doing much more together.

“ADEMU - A Dynamic Economic and Monetary Union” is a project of the Horizon 2020 program of the European Union. More detailed information its activities is available at the ADEMU website: <http://ademu-project.eu/>.

[Conference programme >](#)

25th CEPR EUROPEAN SUMMER SYMPOSIUM IN INTERNATIONAL MACROECONOMICS (ESSIM)

RODA DE BARÀ, TARRAGONA, 23-26 MAY, 2017

The 25th CEPR European Summer Symposium in International Macroeconomics (ESSIM) took place on May 23-26, 2017, at the Banco de España facilities in Tarragona, Spain. ESSIM is an annual meeting that brings together about 75 economists from across Europe and key researchers from outside the region to focus on international economics and other areas of macroeconomics, providing an opportunity for

macroeconomists from different institutions and countries to discuss research, and for young researchers to meet and discuss their work with senior economists.

Sessions on May 23 and 24 focused on the CEPR programme area of Monetary Economics and Fluctuations, while May 25 and 26 featured parallel sessions covering the areas of International Money and Finance, and Macroeconomics and Growth. Plenary sessions relevant to all three programme areas were held late on Wednesday and early on Thursday. Philippe Bacchetta (University of Lausanne and CEPR), Francesco Caselli (LSE and CEPR), Wouter den Haan (LSE and CEPR), and James Costain (Banco de España) organized the conference.

[Conference programme >](#)

FIRST CONFERENCE ON FINANCIAL STABILITY

MADRID, 24-25 MAY 2017

The Banco de España, together with the Centro de Estudios Monetarios y Financieros (CEMFI), organised the first biennial conference on Financial Stability, held at the Banco de España's headquarters in Madrid on 24-25 May 2017. The aim of this conference was to promote research and discussion of topics related to financial stability analysis among academics and policy-makers. Luis M. Linde, Governor of the Banco de España, opened the conference and Mario Draghi, President of the European Central Bank, participated as keynote speaker. Representatives from academia, central banks and supervisory authorities from both sides of the Atlantic held lively exchanges on different issues ranging from the use of DSGE models for financial stability purposes, to empirical approaches for investigating the effectiveness of macroprudential policies. The conference concluded with a panel discussion on the book, "The Countercyclical Provisions of the Banco de España (2000-2016)", which focuses on the experience of the Banco de España with the use of credit provisions as a financial stability tool.

[Conference webpage >](#)

NEW FACES IN MACRO: MADRID WORKSHOP IN QUANTITATIVE MACROECONOMICS

MADRID, 29-30 MAY, 2017

In May, the Banco de España and the Universidad Carlos III de Madrid hosted a meeting entitled

"New Faces in Macro: Madrid Workshop in Quantitative Macroeconomics". The goal of this workshop was to provide a forum for junior economists based in Europe with a special interest in quantitative macroeconomics, and to establish an academic network among this group. The organizers were [Juan Francisco Jimeno](#), [Yuliya Kulikova](#), and [Omar Rachedi](#) of the Banco de España; [Nezih Guner](#) and [Josep Pijoan](#) of CEMFI; and [Andrés Erosa](#), [Felix Wellschmied](#), and [Emircan Yurdagul](#) (Carlos III).

The workshop lasted two days, with seven presenters and discussants each day. The first day was held at the Banco de España, and the second on the Getafe campus of Univ. Carlos III. The workshop covered a variety of topics, ranging from fiscal policy to human capital accumulation. A common theme of many papers was the macroeconomic implications of heterogeneity across households.

[Conference programme >](#)

5th WORLD BANK - BANCO DE ESPAÑA INTERNATIONAL POLICY CONFERENCE

MADRID, 12 JUNE 2017

On June 12, the Banco de España hosted its fifth joint policy conference with the World Bank, entitled "The Future of Globalization and Economic Integration in Europe and Latin America: Implications for Growth and Social Equality". The conference brought together academics and policy makers to discuss the challenges and opportunities of globalization, focusing particularly on implications for growth, employment, and inequality, including possible policy responses. The event was opened by the governor of Banco de España, Luis M. Linde, and the regional vice-president of the World Bank, Jorge Familiar. It featured a keynote address by [Daron Acemoglu](#) (MIT), and two round-table discussions.

[Conference webpage >](#)

FIRST BANCO DE ESPAÑA ANNUAL RESEARCH CONFERENCE

MADRID, 31 AUGUST – 1 SEPTEMBER 2017

On August 31 and September 1, 2017, the Banco de España hosted its First Annual Research Conference in its Madrid headquarters.

In much of the industrialized world, including the euro area, the macroeconomic landscape is characterized

by sluggish growth, inflation persistently below target, low interest rates (including short-term nominal rates close to their effective lower bounds), and increasing risks to financial stability. Against this background, economic policy-makers, including fiscal, monetary and macroprudential authorities, face the formidable challenge of promoting a faster economic recovery and the return of inflation to its target level, while ensuring financial stability. This conference brought together world leading scholars and policy-makers to discuss the causes of these macroeconomic developments and the policy measures to address them. [Tobias Adrian](#), [Ricardo Caballero](#), [Gauti Eggertsson](#), [Emmanuel Farhi](#), [Jesús Fernández-Villaverde](#), [Jordi Galí](#), [Nobuhiro Kiyotaki](#), [Morten Ravn](#), [Tano Santos](#) and [Frank Smets](#), among others, participated in the event.

More generally, our Annual Research Conference aims to become the Banco de España's flagship research conference, and to reaffirm the Banco de España's commitment to research as an indispensable tool for improving economic policy-making.

[Conference programme >](#)

IV WORKSHOP ON INTERNATIONAL FINANCIAL MARKETS

OTTAWA, 21-22 SEPTEMBER, 2017

The Banco de España and the Bank of Canada celebrated their fourth joint "Workshop on International Financial Markets" on 21-22 September in Ottawa.

The workshop invited researchers from academia and central banks to discuss a wide range of theoretical and empirical issues regarding international financial markets. The fourteen presentations covered topics such as international banking, financial market regulation, arbitrage in foreign exchange markets, global financial cycles, international aspects of central banking and international asset pricing. Participants represented a wide range of institutions, including the Banca d'Italia, Bank of Canada, Bank of England, Banco de España, Bank of International Settlements, Federal Reserve Board, International Monetary Fund and leading universities in Canada, Europe and the United States.

The Bank of Canada and the Banco de España anticipate that workshops of this type will continue to be repeated in the future, in order to further strengthen ties and promote joint research projects.

[Conference webpage >](#)

THIRD SEMINAR IN ECONOMIC HISTORY

MADRID, 5 OCTOBER 2017

On October 5, 2017, the Banco de España hosted its Third Seminar in Economic History. As on previous occasions, presentations included the results of research projects on Economic History financed by the Banco de España, together with other submitted papers on Spanish and international economic history. [Prof. Charles Goodhart](#) (LSE) presented the keynote lecture on this occasion.

[Conference programme >](#)

FIRST ANNUAL WORKSHOP: ESCB RESEARCH CLUSTER 1 ON MONETARY ECONOMICS

MADRID, 9-10 OCTOBER 2017

On 9-10 October, the Banco de España hosted the First Annual Workshop of the ESCB Research Cluster 1 on Monetary Economics. The latter is one of three research clusters created by the Heads of Research of the European System of Central Banks (ESCB), with the aim of fostering awareness of ongoing policy-relevant studies and stimulating collaborations among ESCB researchers. The workshop featured state-of-the-art studies, both theoretical and empirical, on the transmission channels and impact of (both conventional and unconventional) monetary policy on the economy and on how best to conduct it. The workshop also benefitted from the participation of two world-leading experts on monetary policy, [Prof. Jordi Galí](#) (CREI) and [Prof. Ricardo Reis](#) (LSE).

[Conference programme >](#)

CONFERENCE ON REAL-TIME DATA ANALYSIS, METHODS AND APPLICATIONS

MADRID, 19-20 OCTOBER 2017

The Banco de España sponsored the 13th Annual Conference on Real-time Data Analysis, Methods, and Applications in Macroeconomics and Finance, which took place on October 19-20, 2017, at its central headquarters in Madrid.

The conference brought together leading researchers in real-time analysis of economic data. It covered topics such as real-time macro- and financial econometrics, forecasting, and macroeconomic policy analysis, among others.

[Conference programme >](#)

FIRST ANNUAL WORKSHOP OF ESCB RESEARCH CLUSTER 2: “MEDIUM AND LONG-RUN CHALLENGES FOR EUROPE”

MADRID, 16-17 NOVEMBER 2017

The First Annual Workshop of Research Cluster 2 of the European System of Central Banks (ESCB) was hosted by the Banco de España at its headquarters in Madrid on 16-17 November, 2017.

Research Cluster 2 is a network intended to foster collaboration across central banks in the European Union on policy-relevant research initiatives in the areas of international macroeconomics, fiscal policy, labour economics, competitiveness, and EMU governance. Its First Annual Workshop was entitled “Medium-and long-run challenges for Europe”. Participants came from more than twenty ESCB institutions, and professors [Pol Antràs \(Harvard\)](#) and [Giancarlo Corsetti \(Cambridge\)](#) delivered keynote lectures.

[Conference programme >](#)

RECENT ECONOMIC RESEARCH SEMINARS

[LINK TO SEMINARS PAGE](#)

SUBJECTIVE INTERTEMPORAL SUBSTITUTION

[GIORGIO TOPA](#)

FEDERAL RESERVE BANK OF NEW YORK,

APRIL 4. 2017

THE MARRIAGE MARKET, LABOR SUPPLY AND EDUCATION CHOICE

[COSTAS MEGHIR](#)

YALE UNIVERSITY,

APRIL 5. 2017

MONETARY POLICY AND LONG-TERM INTEREST RATES

[ORESTE TRISTANI](#)

EUROPEAN CENTRAL BANK,

APRIL 19. 2017

SUSTAINABILITY AND STABILIZATION OF REAL DEBT

[JOSÉ MARIN](#)

AIREF,

APRIL 26. 2017

PUBLIC DEBT EXPANSIONS AND THE DYNAMICS OF THE HOUSEHOLD BORROWING CONSTRAINT

[ANTONIO ANTUNES](#)

BANCO DE PORTUGAL,

MAY 3. 2017

GOOD BOOMS, BAD BOOMS

[GUILLERMO ORDOÑEZ](#)

UNIVERSITY OF PENNSYLVANIA,

MAY 5. 2017

NON-LINEAR EFFECTS OF TAX CHANGES ON OUTPUT: A WORLDWIDE NARRATIVE APPROACH

[DANIEL RIERA-CRUGHTON](#)

BATES COLLEGE,

MAY 8. 2017

SHIFT-SHARE INSTRUMENTS AND THE IMPACT OF IMMIGRATION

[JAN STUHLER](#)

UNIVERSIDAD CARLOS III DE MADRID,

MAY 10. 2017

**FINANCIAL AND PRICE STABILITY IN EMERGING MARKETS:
THE ROLE OF THE INTEREST RATE**

TOBAL MARTIN

BANCO DE MEXICO,
MAY 29. 2017

**22 YEARS OF INFLATION FORECASTING EXPERIENCE
AT THE BULLETIN OF EU AND US INFLATION
AND MACROECONOMIC ANALYSIS**

ANTONI ESPASA

UNIVERSIDAD CARLOS III DE MADRID,
MAY 29. 2017

**SLOWING WOMEN'S LABOR PARTICIPATION:
THE ROLE OF INCOME INEQUALITY**

MARIA JOSE PRADOS

UNIVERSITY OF SOUTHERN CALIFORNIA,
JUNE 5. 2017

**CAPITAL ACCUMULATION AND DYNAMIC GAINS
FROM TRADE**

ANA MARIA SANTACREU

FEDERAL RESERVE BANK OF ST. LOUIS,
JUNE 7. 2017

**SENTIMENT IN CENTRAL BANKS' FINANCIAL STABILITY
REPORTS**

JUAN LONDONO

FEDERAL RESERVE BOARD OF GOVERNORS,
JUNE 12. 2017

**NON-STANDARD MONETARY POLICY MEASURES,
ASSET PRICES AND MACROPRUDENTIAL POLICY
IN A MONETARY UNION**

LORENZO BURLON

BANCA D'ITALIA,
JUNE 21. 2017

**INTERNAL MIGRATION IN DUAL LABOR
MARKETS**

JOAN LLULL

UNIVERSITAT AUTONOMA DE BARCELONA,
JUNE 23. 2017

SAFE ASSETS

JESUS FERNANDEZ-VILLAVARDE

UNIVERSITY OF PENNSYLVANIA,
JUNE 26. 2017

NARRATIVE SIGN RESTRICTIONS

JUAN RUBIO-RAMIREZ

EMORY UNIVERSITY,
JUNE 29. 2017

SAFETY, LIQUIDITY, AND THE NATURAL RATE OF INTEREST

MARCO DEL NEGRO

FEDERAL RESERVE BANK OF NEW YORK,
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**GENDER PEER EFFECTS, NON-COGNITIVE SKILLS
AND MARRIAGE MARKET OUTCOMES: EVIDENCE
FROM SINGLE-SEX SCHOOLS IN THE UK**

KATJA KAUFMANN

UNIVERSITY OF MANNHEIM,
SEPTEMBER 6. 2017

MONETARY POLICY ACCORDING TO HANK

BENJAMIN MOLL

PRINCETON UNIVERSITY,
SEPTEMBER 14. 2017

THE REAL EFFECTS OF RELATIONSHIP LENDING

LEONARDO GAMBACORTA

BANK FOR INTERNATIONAL SETTLEMENTS,
SEPTEMBER 15. 2017

**DYNAMIC SCORING OF TAX REFORMS IN THE EUROPEAN
UNION**

SALVADOR BARRIOS

JOINT RESEARCH CENTRE OF THE EUROPEAN COMMISSION,
SEPTEMBER 20. 2017

**COULD A HIGHER INFLATION TARGET ENHANCE
MACROECONOMIC STABILITY?**

JOSÉ DORICH

BANK FOR CANADA,
SEPTEMBER 25. 2017

PEOPLE

NEW FACES



**CLODOMIRO FERREIRA
MAYORGA**

Financial Analysis Division
ADG Economics and Research

CLODOMIRO FERREIRA joined the Financial Analysis Division in October 2017. Previously, he was a Visiting Researcher and Research Fellow at London Business School (2014-2017), a Ph.D. researcher at the Bank of England (2013) and a Ph.D. intern at the Bank of Hungary (2010). He also worked as a consultant in transport engineering projects before his graduate studies. He holds a Ph.D. in Economics from the European University Institute (May 2016), an M.Sc. in Economics from CEMFI (2008) and a B.Sc. from the Universidad de San Andrés (Argentina).

Clodomiro's research focuses on the aggregate consequences of household and firm heterogeneity, from an empirical, theoretical and computational point of view. In particular, he is interested in the role of the housing and mortgage markets as a source of transmission from individual to aggregate dynamics. His latest research paper investigates

the heterogeneous responses of households that differ in their housing tenure and debt positions to changes in income and interest rates. The paper exploits exogenous variations in monetary policy, together with the different institutional features of US and UK mortgage markets, and finds significant heterogeneity in consumption behaviour, as a consequence of the interaction between liquidity constraints and the general equilibrium effect of interest rates on household's disposable income.

His current projects focus on two broad areas: (i) understanding how firms with different financial structures react, in terms of investment and employment, to monetary policy surprises; and (ii) the role of housing and mortgage markets in shaping intergenerational mobility and inequality.

Research page:
<http://www.cfferreira.com/>



GERGELY GANICS

Modelling and Macroeconomic Analysis Division
ADG Economics and Research

GERGELY GANICS joined the Modelling and Macroeconomic Analysis Division of the Banco de España in September 2017. Gergely obtained his Ph.D. degree from Universitat Pompeu Fabra (Barcelona) under the supervision of Barbara Rossi. He also holds an M.Sc. in Economics from the Barcelona GSE. He was a teaching assistant of econometrics courses at the Ph.D., Master's and undergraduate levels.

Gergely's main research interests are macroeconomics and forecasting. In particular, in his recent paper entitled "Optimal density forecast combinations", he proposes a new method of combining density forecasts, which not only has

favorable theoretical properties, but also performs well empirically when applied to forecasting US industrial production. For this paper, Gergely was awarded the 3rd UniCredit & Universities Best Economics Job Market Paper Award and the 2nd Marcelo Reyes Prize.

In his future research, Gergely plans to focus on forecasting problems which require a sound theoretical approach and provide guidance to applied researchers.

Research page: <https://sites.google.com/view/gergelyganics>



GUILHERME BANDEIRA

Modelling and Macroeconomic Analysis Division
ADG Economics and Research

GUILHERME BANDEIRA joined the Modelling and Macroeconomic Analysis Division of the Banco de España in September 2017. Guilherme obtained his Ph.D. in economics from the European University Institute in March 2016, and also holds an M.Res in economics from the EUI, an M.Res. from the Paris School of Economics, and an undergraduate degree in economics from the Catholic University in Lisbon. During his Ph.D., Guilherme spent several months at the Banco de la República of Colombia and the Reserve Bank of Australia, as well as at the University of New South Wales as a visiting researcher.

Guilherme's research focuses on various aspects of open economy macro and macroeconomic policy, mainly through the lenses of dynamic general equilibrium macro models. One of his recent projects addressed alternative fiscal consolidation strategies in the periphery of the Euro area when the nominal interest rate is constrained at its lower

bound. It showed that cuts in public hiring increase unemployment persistently in this environment, while wage cuts can reduce it.

Other projects Guilherme is currently carrying out include assessing the macroeconomic and welfare implications of fiscal transfers between member countries of a monetary union, studying the impact of structural reforms when monetary and fiscal policy are constrained, and exploring how international labour mobility affects macroeconomic dynamics, particularly in times of fiscal tightening.

Guilherme is also involved in the development and estimation of a dynamic general equilibrium model of the Spanish economy that will be used, in conjunction with other existing tools, by the Banco de España during its regular forecasting processes.

Research Page: <https://sites.google.com/view/guilhermebandeira>



FEDERICO TAGLIATI

Structural Analysis Division
ADG Economics and Research

FEDERICO TAGLIATI joined the Structural Analysis Division of the Banco de España in September 2017, after obtaining his Ph.D. in Economics from University College London. Federico completed his undergraduate studies at the University of Turin, and he holds an M.Sc. degree in Economics from Collegio Carlo Alberto and a Master's degree in Economics from the University of Turin. Before joining the Banco de España, Federico worked as a teaching assistant at University College London, where he taught courses in statistics, econometrics and financial economics.

Federico's research lies in the field of applied microeconomics. In one of his papers, he develops a new methodology to compare the effects of transfers in-cash versus transfers in-kind on the

welfare of recipients. Using unique household data from Mexico, he finds that cash and in-kind transfers are on average equally cost-efficient, but that transfers in-kind generate welfare gains that are larger for relatively richer households.

In another project, Federico estimates a structural model of human capital formation to investigate how parental investments and teaching quality affect the educational achievements of children in primary school. He is also currently working on the evaluation of a subsidized employment program that aims to increase labour market participation in Macedonia by providing a wage subsidy to participating employers.

Research Page: <https://sites.google.com/site/federicotagliati>



MORITZ ROTH

International Economics Division
ADG International Affairs

MORITZ ROTH joined the International Economics Division within the ADG International Affairs of the Banco de España in September 2017. Previously, he obtained his Ph.D. in Economics from the European University Institute (EUI), and he also holds an M.Sc. in Economics from the University of Warwick and a B.Sc. in Economics from the University of Mannheim. During his Ph.D. studies, Moritz was a trainee at the Research Centre of the Deutsche Bundesbank and in the DG Economics of the European Central Bank (ECB).

His research focuses on international macroeconomics and spillovers, as well as monetary policy and inequality. In a recent research paper entitled "International Co-Movements in Recessions", he finds that business cycle correlations are state-dependent, and are higher in recessions than in expansions. His paper builds an international real

business cycle model with occasionally-binding constraints on capacity utilization which can account for this state-dependency in cross-country GDP growth correlations. Empirically, he successfully tests for the presence of capacity constraints using data from the G7 advanced economies in a Bayesian threshold autoregressive (T-VAR) model.

Moreover, in a joint work with coauthors at the ECB and the Bundesbank, Moritz investigates the distributional effects of prolonged low interest rates on household portfolios and wealth inequality across the member countries of the Eurozone, using aggregate data from the Euro Area Accounts (EAA) and individual household data from the Household Finance and Consumption Survey (HFCS).

Research Page: <https://sites.google.com/site/moritzaroth/home>



SANDRA GARCÍA-URIBE

Structural Analysis Division
ADG Economics and Research

SANDRA GARCÍA-URIBE joined the Microeconomic Analysis Division at the Banco de España in September 2017. She holds a Ph.D. in Economics from CEMFI (June 2017). During her Ph.D. studies, Sandra visited the Department of Economics at the Univ. of Pennsylvania. Sandra also holds an M.Phil. in Economics and Finance from CEMFI and a B.A. (Licenciatura) in Economics from the Univ. of Alicante. Throughout her studies at CEMFI, Sandra was a teaching assistant in courses in statistics, microeconometrics and big data for social sciences.

Sandra does empirical research in the field of media economics, and her projects deal with the analysis and management of large databases of text, which is a central aspect of so-called “big data” research. In her work, “Multidimensional Media Slant: Complementarities in News Reporting by US Newspapers”, she studies the determinants of the daily choice of front page news items made by editors of major US newspapers. Her results provide evidence of complementarities between certain groups of news for each newspaper and shows that

these biases account for a considerable portion of the probability that a particular news item appears in the front page. She also provides a structural model for the newspaper’s choice of front page news, in which the measures of bias can be interpreted as preferences of the population of readers that the newspaper targets in the short run.

Throughout her research Sandra applies automatic text analysis and machine learning to measure media choices. Using these measures she has also studied the effects of entry of a new competitor in the content decisions of the two main Spanish printed newspapers of the eighties.

Another line of Sandra’s research is taxation, where she is using news data to construct a measure of the anticipation of tax bill approvals in the US Congress, and estimating the effects of anticipated information about future tax changes on monthly latent economic activity.

Research Page: <http://sites.google.com/view/garciauribe>

VISITING FELLOWS



MARTÍN GONZALEZ EIRAS

Associate Professor
University of Copenhagen

Martín Gonzalez-Eiras is Associate Professor of economics at the University of Copenhagen. He holds a Ph.D. in economics from MIT, and has been on the faculty of Universidad de San Andres (Argentina) and Universidad Adolfo Ibáñez (Chile). He held visiting positions at IIES (Stockholm), Study Center Gerzensee, and Columbia University. He has research interests in macroeconomics, political economy, public finance and banking. He has papers published in the *Journal of Monetary Economics*, *European Economic Review* and the *Review of Economic Dynamics*. He has been a consultant at

the Inter-American Development Bank and has received a variety of grants and awards, including the GDN First Prize Medal in Financial Markets and a Fulbright research grant. During his stay at the Banco de España as a visiting fellow he will work on a project, joint with Søren Hove Ravn from the University of Copenhagen, on the effect of conspicuous consumption motives for business cycle dynamics and monetary policy.

Research Page:
<http://alum.mit.edu/www/mge>



FEDERICA ROMEI

Assistant Professor
Stockholm School of Economics

Federica Romei has been an Assistant Professor at the Stockholm School of Economics since 2015 and a Research Affiliate at the CEPR since 2016. Federica obtained her Ph.D. in Economics from LUISS in June 2014. Between 2014 and 2015 she was a Max Weber and Jean Monnet fellow at the European University Institute. She is will be visiting the Banco de España for six months over the course of 2017 and 2018.

Federica does research in monetary economics, fiscal policy and international macroeconomics. Her research has mostly focused on optimal fiscal and monetary policy in the presence of private or public debt deleveraging. She published her paper “Debt Deleveraging and the Exchange Rate”, joint with Pierpaolo Benigno (LUISS), in the *Journal of International Economics*.

In a recent project entitled “The Paradox of Global Thrift”, joint with Luca Fornaro (CREI), she studies the global effect of noncooperative macroprudential policies. Starting from the observation that the global economy is currently characterized by low interest

rates, and by widespread liquidity traps associated with episodes of debt deleveraging, the authors argue that the world is now vulnerable to a paradox of global thrift. Their conclusion is based on a multi-country model of an imperfectly financially integrated world, in which equilibrium interest rates are low and monetary policy is occasionally constrained by the zero lower bound. Idiosyncratic shocks generate capital flows and asymmetric liquidity traps across countries; it is then optimal for governments to implement countercyclical macroprudential policies, taxing borrowing in good times as a precaution against the risk of future liquidity traps. When implemented globally, however, these interventions trigger a paradox of global thrift. Rather than fostering precautionary savings, these macroprudential policies further depress global rates and exacerbate the recession in countries currently stuck in a liquidity trap. These results point toward the need for international cooperation during periods of low interest rates.

Research Page: <https://sites.google.com/site/romeifederica/>

ANNOUNCEMENTS

UPCOMING CONFERENCES

[LINK TO CONFERENCES PAGE](#)

SPAIN: FROM RECOVERY TO RESILIENCE

MADRID, 3 APRIL 2018

On Tuesday, April 3, the Banco de España will host the conference “Spain: From Recovery to Resilience”, jointly organized with the International Monetary Fund (IMF). The conference aims to draw lessons from Spain’s crisis responses and to discuss policy options to ensure a sustained and inclusive economic path forward. Both academics and policy makers from inside and outside Spain will participate.

[Link to conference website >](#)

FOURTH NABE INTERNATIONAL SYMPOSIUM

MADRID, 16-17 APRIL 2018

On Monday and Tuesday, 16-17 April, the Banco de España will host the International Symposium of the National Association of Business Economics (NABE). The Symposium, to be entitled “Global Recovery: the Good, the Bad, and the Ugly”, will address challenges faced by US and European businesses in today’s economy.

Information about [NABE 2018](#) is available at the following website:

<https://nabe.com/is2018>

FIFTH WORLD BANK – BANCO DE ESPAÑA RESEARCH CONFERENCE

MADRID, 5-6 JUNE 2018

On June 5-6, the fifth joint Research Conference of the World Bank and the Banco de España will take place in Madrid. The conference, entitled “Macroeconomic Policies, Output Fluctuations, and Long-Term Growth”,

will examine the effects of monetary and fiscal policies on the business cycle and on long-run labor productivity and growth. The geographical scope of the conference is global, but special consideration will be given to papers with applications to Europe, to emerging markets in general, or to Latin America in particular.

[Call for papers \(Deadline: 2 March 2018\) >](#)

SECOND BANCO DE ESPAÑA ANNUAL RESEARCH CONFERENCE: TAXES AND TRANSFERS

MADRID, 3-4 SEPTEMBER 2018

On September 3-4, the Banco de España will host its second Annual Research Conference, which will be jointly organized with the Institute for Fiscal Studies (UK). At the conference, entitled “Taxes and Transfers”, leading academics will address a wide range of fiscal policy questions. The organizers are [Olympia Bover](#) (Banco de España), [Richard Blundell](#) (UCL), and [Nezih Guner](#) (CEMFI).

[Programme of First Banco de España Annual Research Conference \(2017\) >](#)

FINANCIAL INTERMEDIATION AND THE FUTURE OF THE BANKING SECTOR

MADRID, 30 OCTOBER 2018

On October 30, the Banco de España will host a conference on “Financial Intermediation and the Future of the Banking Sector”. The conference will be jointly organized with SUERF, the European Money and Finance Forum. More information about SUERF activities is available here:

<https://www.suerf.org/>

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