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Editorial

Jean-Pierre Villetelle, Head of the Companies Observatory

Banque de France company data: opening up to academia

There is a long tradition of using individual data in the study of economic issues. One of the earliest examples, and among the most emblematic for economists, was perhaps Ernst Engel's article on household consumption, published in 1857. In his study, Engel set out the laws that would adopt his name which he formulated based on a sample of data relating to 153 Belgian families that had previously been compiled by Édouard Ducpétiaux (Stigler, 1954). The importance of individual company data in research is no exception, particularly as they may be relevant to a wide range of different fields of economics, such as – naturally – research on businesses (demographics, organisation, governance, performance, financing, internationalisation, business-to-business relationships, etc.) and also on the labour market, taxation, economic policy (and particularly monetary policy and transmission mechanisms) and price formation. Nevertheless, during the mid-1980s, work performed by Stafford (1986) based on a review of 759 research publications on the labour market found that virtually none of them used individual company data. This could be the result of the difficulties encountered in collecting data, or at least good quality data, in this field.

> "Before using data collected for administrative reasons for academic purposes, it is vital to consider what information was collected, by whom and why."

The direct exploitation of certain individual data is sometimes limited by the fact that they are mostly collected for administrative purposes. Therefore, the requirements they fulfil are not necessarily those of researchers. However, in certain cases, this type of data can be used productively and sometimes in unexpected ways. For example, the great survey of England, decreed by William the Conqueror and completed in 1086 that became known as the Domesday Book, was used more than 900 years later to position the output of manor houses – a type

.../...

of company at that time – in the XIth century England in relation to their production frontier, as well as to explore the estate manager's potential contribution to this situation (McDonald, 2008). History is therefore another field of research that can draw on individual company data.

Before using data collected for administrative reasons for academic purposes, it is vital to consider what information was collected, by whom and why. The answers to these questions determine the content of the databases that result from this type of collection, as well as the constraints that will condition their use for other purposes.

The Banque de France's FIBEN company database

Collecting information on non-financial companies and their management is fundamental to the Banque de France's implementation of monetary policy. For example, to refinance operations with the central bank, as long as banks can guarantee credit claims as collateral they hold on companies as a result of their corporate lending activities, the central bank must be able to assess the quality of those claims. The collection of this data is essential to one of the business areas of the Banque de France and was put in place upon its creation in the XIXth century. The Eurosystem Credit Assessment Framework (ECAF), implemented on 1 January 2007, specifies the procedures, rules and techniques that ensure that the Eurosystem requirements are met in terms of the credit standards for all assets eligible as collateral in the monetary policy and overnight lending operations (Schirmer, 2014).

The information that the Banque de France collects for this purpose comes from a range of sources: from the companies themselves (accounting and qualitative data), banks (outstanding bank borrowings reported in the central credit register, payment incidents), surety and credit insurers (outstanding amounts guaranteed, reported claims on their policyholders' customers) and commercial courts (judicial developments in relation to companies, and their managers and partners). All this data is collated in the FIBEN company database. Due to their primary use, the data principally targets financial information, and as a priority, the financial information of companies that potentially have credit claims that can be used as collateral, i.e. of a sufficiently high amount. Therefore, certain data is only collected for companies whose annual turnover is in excess of EUR 750,000.

Using the FIBEN database for research purposes

Despite its specific orientation, the FIBEN database contains a wide range of data that can be exploited in the dissemination of information, studies and research on companies. The reason for this is that compared with the majority of the other central banks, the Banque de France gives considerable weight to credit claims in the range of securities eligible for refinancing operations. They currently represent almost 40% of eligible securities in France against a little more than 20% for the euro area as a whole. The Banque de France alone rates seven times more companies than all the central banks with In-House Credit Assessment Systems (ICAS) combined: around 250,000 companies, compared with less than 25,000 companies rated by the second most active bank in this respect, the Bundesbank.

Examples of research work conducted at the Bank that exploit FIBEN data

Of course, working within the Banque de France provides privileged access to and use of FIBEN data for research purposes, particularly following the creation of the MUSES IT platform for the pooling of statistical series that now helps the Bank's researchers to access these data. A wide variety of themes are considered but financing issues are particularly prevalent as the many papers published on this subject in the *Quarterly Selection of Articles*, for instance, attest. A number of recent examples can be cited. Cahn *et al.* (2017a) analyse the effect of suppressing a manager indicator value in 2013 that had previously flagged entrepreneurs involved in non-fraudulent corporate liquidation in the FIBEN database. The authors assess its impact on the probability of failed entrepreneurs creating a new firm, their ease of access to credit and the likelihood of a further default. Cahn *et al.* (2017b) study the effect on credit supply of the 2012 extension of the range of loans eligible as collateral for refinancing operations, through the relationships between firms and banks and particularly firms with multiple bank relationships. Mésonnier *et al.* (2017) exploit the same collateral extension measure to assess the reduction in interest rates paid on new loans granted to the targeted companies, via the decrease in the liquidity risk premium on the one hand and the identification of the type of banks the most affected by the measure on the other. Avouyi-Dovi *et al.* (2016) investigate whether very low interest rates help keep insolvent firms afloat.

With regard to other research themes, Bergeaud and Ray (2017) use the tax on realised capital gains on real estate assets, which causes varying adjustment costs from one firm to the next, to study the effect of these frictions on company behaviour within the framework of a general equilibrium model with heterogeneous firms. The model's predictions are then confronted with French company data for the 1994-2013 period. Fougère *et al.* (2017) study the possible contradictory effects of real estate prices on corporate productive investment, given that while this type of asset is a production input, it can also be used as collateral. Consequently, an increase in real estate prices pushes up the market value of the pledgeable asset but simultaneously cuts profit due to the rise in an input cost. The authors confirm the existence of varying effects on a population of heterogeneous firms using company data.

Lastly, less recent work such as that of Kremp and Sevestre (2013) should not be forgotten. Kremp and Sevestre base their work on a fixed-price model to assess the degree of rationing on the credit market for SMEs during the crisis. The dissemination of the results of this research outside of academic circles and economic institutions made a significant contribution to reaching a consensus on this analysis on the marketplace. And still at the crossroads of academic work and the marketplace, Sevestre and Servant (2015) seek to assess the effects of the reduction in business-to-business payment periods, whose maximum term was capped under the Economic Modernisation Act (*Loi sur la Modernisation de l'Economie* – LME) of 2008.

Opening up FIBEN data to research outside the Banque de France

Since January 2017, the Banque de France has given external researchers the opportunity to freely access individual data, subject to a reasoned request to the Bank committee responsible for considering the applications (*Comité d'examen des demandes d'accès*). The anonymised data is made available to

the researchers in its Open Data Room (ODR). Since the opening of the ODR, access to individual company data has been the most popular request. The fifteen or so projects currently underway that use these data represent approximately 40% of all approved applications.

Jean-Pierre Villetelle has headed the Companies Observatory at the Banque de France's Companies Directorate since 2012. Previously, he worked in different roles with the Business Conditions and Macroeconomic Forecasting Directorate and was seconded to the European Central Bank's Directorate General Research for a two-year period. He has a bachelor's degree in mathematics from Paris' Université Pierre et Marie Curie and a post-graduate degree in mathematical economics and econometrics from the Université de Paris I Panthéon-Sorbonne.

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> **"Demographic phenomena such as migration or the aging of the population have major impacts on the housing construction cycle, including in the short and medium term."**

How has the specialist of "a more historical approach to economics" succeeded in a directorate whose work is rather focused on the economic environment and forecasts?

While conducting research in economic history and working within the DCPM may seem paradoxical at first glance, the interactions between history and economic analysis are in fact stronger than what is believed. Historians are accustomed to building their own data and taking a very critical look (some would even say "too" critical) at statistics, by studying precisely how they are produced by the general government. This attitude towards data is very useful when analysing the economic situation and producing forecasts: it is essential to know all the twists and turns of national accounts and some financial data, and it is often that fluctuations in the statistical series are in fact highly dependent on the chosen methodology. Second, it is obvious that we will not interpret the same phenomenon if it is cyclical and occurs almost identically every 5 years, or if it happens for the first time in 50 years. However, apart from a few macroeconomic aggregates, few series are published over a long period. It is therefore useful to have a good knowledge of existing sources and historical series in order to gather the necessary information.

When I joined the DCPM, it was headed by Pierre Sicsic, who had also previously published economic history articles. It is probably not a coincidence ... More generally, many researchers in economic history work as economists in central banks, especially in the United States. And in the wake of the financial crisis, both at university and in central banks (what comes to mind in particular are the lauded statements by Andy Haldane, the chief economist of the Bank of England) many have called for more historical studies, in addition to standard macroeconomic models. Although much of my DCPM activity does not involve economic history, adopting a historical approach is often very useful as a backdrop.

How useful is your research to the Banque de France or, more generally, to the conduct of monetary policy?

Like most researchers at the Banque de France, I am working on several research topics. Some are directly linked to the activities of the DCPM and my role as an economist in this directorate, working on issues related to investment and real estate. Others are more general and cover multiple aspects of monetary policy. Given the sometimes very long timeframe of research projects, it is inevitable that some studies are more cross-sectoral and involve researchers beyond the immediate concerns of the directorate where they are working at a given time. At the DCPM, I have mainly focused on the housing economy. When I joined in 2013, it was necessary to review the analysis and forecasting models of the construction sector. Together with Insee, we have developed a new housing investment forecasting model (Faubert *et al.* 2015) and with my DCPM colleagues, we have built a new forecasting model of French GDP integrating the construction sector (Thubin *et al.* 2016). A research topic that I examined was the link between housing investment and demography (Monnet & Wolf 2017). Changes in the working population largely explain why housing investment evolves differently from other components of GDP. Demographic phenomena such as migration or the aging of the population therefore have major impacts on the housing construction cycle, including in the short and medium term. These results, however intuitive they may be, cast a different light in current debates on housing policies in France, often focused on credit, taxation and supply issues.

However, my research in this field, merely builds on the conclusions drawn by economic historians in the past, notably Simon Kuznets for the United States. Beyond their contribution to the forecasts published by the Banque de

France and the ECB, I was able to use this work in working groups, for the Risk Assessment of the French Financial System or as a member of the expert group of the Eurosystem on real estate issues. The real estate sector is also a crucial issue for financial stability. Yet, the bulk of my research has focused on monetary policy and the history of central banks. Many instruments of what is now called "unconventional monetary policy" were in fact commonly used in the past. Of course, political contexts are always different, but in terms of monetary policy instruments, there is nothing really new. For a long time, interest rates were not the preferred instrument of central banks (Monnet 2014, 2016, Levy-Garboua & Monnet 2016). These were purchasing assets (Bazot, Bordo & Monnet 2016), including public debt (Duchaussoy & Monnet 2015), carrying out long-term targeted refinancing operations (Monnet 2014) or, as with current macro-prudential policies, using direct controls of bank credit and liquidity ratios (Kelber & Monnet 2014, Monnet & Vari 2017). History is an inexhaustible pool of examples which provide a basis for examining the merits of the monetary policy instruments that are used today, their potential effects, their limits and their future developments. I have had the opportunity to present this research at the Banque de France, but also in various conferences and many central banks abroad, to other researchers or monetary policy-makers. These presentations give rise to new questions and suggestions, each of which will feed new research.

On what will you focus your research in the coming years?

In addition to my work on investment and real estate issues at the DCPM, I am currently pursuing two other research projects that will probably span several years. First, I will continue my studies on the functioning of the Bretton Woods system (Monnet & Puy 2016, Monnet 2016, 2017). After the crisis, there were calls, particularly from China and some emerging countries, to create a "new Bretton Woods", referring to the system established in 1944. It is true that, since this system (1944-1971) had been characterised by sustained growth and no financial crisis, the idea is tempting. The swap network put in place by the major central banks from 2007 onwards is also reminiscent of what existed in the 1960s, as well as the IMF's more open attitude towards capital controls. However, little is actually known about the functioning of monetary policies and the cooperation between central banks during this period.

My second project concerns the banking crisis of the 1930s in France. Since the banking regulation was only introduced in France in 1941, little is known about the balance sheets of French banks before that date. We have no statistical information on banks' difficulties in France during the Great Depression of the 1930s, let alone reliable information on the causes of bankruptcy and interbank contagion. All references to the banking crises of the Great Depression, which are frequent today in the debates on banking regulation, concern the United States. However, now as in the past, the French banking system is very different from the American system. I am part of a team, which includes several researchers from the Paris School of Economics, and our aim is to gather many historical sources to significantly improve our knowledge of the French banking system during the interwar period and, more generally, to understand the reasons underlying the banking crises and the historical specificity of the French banking system.

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> **"The Banque de France offers the possibility of promoting research findings via channels like *Working papers*, *Bulletin*, *Rue de la Banque*, Blog, etc.."**

Can you tell us about your studies and career?

After two years of preparatory classes for business school selective entrance exams, I was admitted to Edhec where I studied a specialised programme in corporate finance. As part of these studies, I completed several long internships including in the M&A department of BNP Paribas in Paris and in the French strategic investment fund. These professional experiences led me to consider the implications of these financing and investment activities in a broader context than that adopted when studying an individual case. I discovered that economic science offered theoretical frameworks as well as statistical tools that could provide answers to such questions. So I decided to take, at the same time as my finance programme, a Master's in Economics at the Aix-Marseille School of Economics (AMSE). My enthusiasm for economic research, which developed when I was writing my Master's thesis that attempted to incorporate microfinance technology into a macroeconomic model, led me to do a PhD.

The Banque de France then offered me a research training contract (CIFRE) which allowed me to conduct my doctoral thesis under the supervision of Patrick Pintus at the AMSE, and Rémy Lecat at the Banque de France, while discovering the workings of a central bank research department. During this thesis, I benefited from a highly stimulating environment while working with several experienced, available researchers and while attending many Banque de France seminars. I was also able to contribute to more institutional studies associated with my research. After defending my thesis in 2016, I was recruited in the Structural Policy Analysis Division, thus enabling me to continue the projects I had started during my thesis. It also allowed me to commence new research projects while increasing my participation in the directorate's more operational tasks.

In what ways is your research beneficial to the Banque de France or, more specifically, to the conduct of monetary policy?

My research agenda focuses mainly on the role of the land and property component in business production processes. I then focused on the corporate finance literature explaining credit rationing, in order to understand the role of real estate collateral (Kaas, Pintus and Ray, 2016 and Fougère, Lecat and Ray, 2017), as well as other aspects of corporate microeconomics that explain the impact of the adjustment costs of real estate assets on the allocation of factors of production across firms (Bergeaud and Ray, 2017). I also started research to understand the role of the tax treatment of the depreciation of business assets on investment behaviour. Most of these research projects are based on very extensive company databases compiled and made available by the Banque de France. These studies aim to contribute to the understanding of corporate investment and productivity dynamics, which are two major factors for establishing the macroeconomic assessment underlying the conduct of monetary policy. In the framework of these analyses, the identification of potentially distortive and suboptimal mechanisms, such as tax-based adjustment costs that hinder the adjustment of the size of business premises, may also result in economic policy recommendations.

How have you managed to keep up such intense and diverse research work over the past years while participating in a number of "collective" interest studies (Blog, etc.)?

My directorate allows economic researchers to allocate on average, half their time to academic research. This organisation enables them to conduct research projects that are of interest to the Bank. These projects are intended for publication in peer-reviewed journals. Alongside this research, I contribute to the work of my directorate by writing memos on different issues related to structural policies in France and the euro area, in particular on property and housing policy. I am also participating in a Banque de France research project in this area (Avouyi-Dovi, Labonne, Lecat and Ray, 2017). Since I was recruited, I have also taken part in two cross-cutting projects: coordination of the Banque de France's economic report and participation in the editorial team of the Banque de France blog launched in December 2016. These activities require other skills and different research horizons and cover a wide range of topics, which is instructive and allows me to better understand the organisation of the Bank.

Have you kept ties with you former research or training lab? If so, are you developing any joint projects with you former lab colleagues and how do they fit in with your activities at the Bank?

I remain affiliated to the AMSE and plan new research work with my PhD supervisor, Patrick

Pintus. Doing my thesis at the Banque de France in the framework of a CIFRE contract has meant that I have not been able to spend time at the Aix-Marseille laboratory. However, I have benefited from the advice of several researchers there. These exchanges were very valuable throughout my thesis. The annual Banque de France-AMSE Labour Market Conference, in which I participate, is also an opportunity to discuss ongoing research on related subjects studied in both institutions.

What is your impression of your first years as a researcher at the Bank?

I have a very positive impression. I consider the Banque de France to be a very favourable environment for conducting academic research, and in particular working on a thesis on a topic requiring a variety of different tools. The Banque de France offers the possibility of promoting research findings via a number of channels (*Working papers*, *Bulletin*, *Rue de la Banque*, Blog, etc.). Moreover, it provides easy access to the microeconomic data required to conduct research on business behaviour. The Banque de France's interest in the themes on which its economists work also guarantees the topicality of these subjects in institutional debates.

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The effect of globalization on wage inequalities

Carluccio (J.), Ekeland (I.) and Guesnerie (R.) "Fragmentation and Wage Inequality: Insights from a Simple Model," *Annals of Economics and Statistics, Special issue in the Honor of E. Malinvaud*, No. 125/126, June 2017

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> **"Higher productivity in the South raises the participation of Southern workers in the Global Value Chains, lowering the price of the international good."**

Most of the manufactured goods are "made in the world", under a production process that integrates supplies located in many distant countries. Local labor markets become interconnected, with developments in one location potentially affecting the labor market outcomes of individuals working in faraway locations. Juan Carluccio, Ivar Ekeland and Roger Guesnerie develop a simple theoretical model that sheds light on how the integration of emerging economies into global value chains affects wage inequalities in developed countries, as well as the wage differential between developed and developing ones.

"Made in the World" and the international division of labor

During the past decades the world has witnessed an unprecedented increase in the extent of production sharing across borders. Advances in communication technology and reductions in transportation costs allow firms to coordinate operations across borders and locate part of the production process in those locations offering the lowest costs. One widely cited example of such "Global Value Chains" (GVCs) is the production of IPad by Apple, which is designed in California and assembled in China from pieces manufactured in Asia, Europe and Brazil. Nowadays, goods are "made in the world".

A new international division of labor has emerged, whereby developed countries add value mostly through the supply of educated workers and physical capital, and developing ones hosting the most unskilled-intensive parts of the production process. This geographical specialization has been deepening since the 1990s, as documented by Timmer *et al.* (2014).

Local labor markets become interconnected through the operations of global firms: developments in one location (for example, demographic or productivity shocks) affect the labor market outcomes of individuals in distant countries.[1] How does this new structure affect wage inequalities? And through which channels?

A model of global value chains and wage inequalities

Carluccio, Ekeland and Guesnerie (2017) develop a simple model with production sharing across borders. The model features two countries, called North and South. The workforce in the North is composed of both skilled and unskilled workers, and that of the South unskilled ones. There is an "international" good, produced from all local factors and consumed everywhere, capturing the idea that goods are "made in the world" through GVCs. In each country a non-tradable good is produced. Importantly, the international good is assumed to require the use of skilled-labor more intensively.

The simple structure of the model allows a better understanding of the general equilibrium effects of GCVs, in particular how supply and demand interact in the world economy. In comparative statics, we study how parameters measuring different aspects of global integration shape wage inequalities, both within and across nations. The model departs from the realistic situation where, due to differences in the relative sizes of countries, wages are lower in the South.

Increasing Southern integration into global production and consumption generates wage inequalities in the North, and reduces North-South differentials

The results show that parameters measuring the extent of the South's integration are key in increasing wage inequalities in the North and reducing North-South wage differentials. Higher productivity in the South raises the participation of Southern workers in the GVC, lowering the price of the international good. Both the higher productivity and the correspondent shift in labor demand towards the traded good and away from the local goods increase the relative demand for skilled workers, widening the wage-gap in the North, and reducing the wage differential between unskilled workers in the North and the South. Similar effects arise when the substitution between northern and southern workers in the GVC increase. In our synthetic model, it can be interpreted as either technological developments or increases in the south's workforce ability.

1 One early observers of this phenomenon, Richard B. Freeman, asked in a highly influential paper in 1995 "Are your wages set in Beijing?"

Similarly, wage inequalities in the North increase when southern workers shift their consumption towards the international good and away from the local good. This kind of change in the structure of consumption in emerging countries as a result of their higher income have been widely documented.

The theoretical analysis is complemented with a simple numerical simulation. We fit the model to replicate the distribution of value added in GCVs as documented by Timmer et al (2014). Using input-output tables covering 40 countries, they document an increase in the share of the South together with a decrease in the weight of Northern unskilled workers. The simulations point to the changes in the weight of the South in GVCs as the main driver of the evolution of relative wages. Changes in factor endowments, namely the increase in the relative size of the South and the increase in the relative endowment of skilled workers in the North, are relatively minor in size and have little explanatory power for the factor shares and the distribution of global value added.

An alternative approach

The study of the mechanisms linking globalization to labor market outcomes have gained strong attention in the light of the discontentment expressed by workers in developed economies and the importance of the public debate it generated.

Carluccio, Ekeland and Guesnerie (2017) propose a theoretical approach that, contrary to the bulk of current literature, assumes frictionless markets, thus allowing the analysis to focus on the role of economic fundamentals such as productivity and tastes. In this sense, the model takes a step back from the current literature, in order to, hopefully, take our knowledge further.

Foreign Direct Investment Drivers and Growth in Central and Eastern Europe in the Aftermath of the 2007 Global Financial Crisis

Jimborean (R.) and Kelber (A.) "Foreign Direct Investment Drivers and Growth in Central and Eastern Europe in the Aftermath of the 2007 Global Financial Crisis", Comparative Economic Studies, Vol. 59, issue 1, p. 23-54, 2017.

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> **"...the positive impact of FDI inflows on economic growth has amplified during the 2007 crisis, while it has become non-significant during the 2011 crisis."**

Ramona Jimborean and Anna Kelber provide new insights on the developments and the drivers of FDI (foreign direct investment) in Central and Eastern European countries over the period 1993-2014, while taking into account the occurrence of the 2007 and 2011 crises.

The role played by FDI in the economic growth process is debatable. On one hand, FDI inflows (referring to long-term capital investment such as the purchase or construction of machinery, buildings, or whole manufacturing plants) have been considered a somewhat natural factor of the catching-up process of Central and Eastern European Countries (CEECs) with the old European Union (EU) Member States. On the other hand, there is the belief that prior to the 2007 global financial crisis the growth pattern in the region was excessively dependent on capital inflows that have led to the build up of unsustainable macroeconomic and financial imbalances and large vulnerabilities.

FDI inflows are found to be driven by both external and domestic factors

Ramona Jimborean and Anna Kelber use a general-to-specific approach to analyze the determinants of FDI inflows. This approach allows selecting a parsimonious final model from a large set of real world variables whilst avoiding unnecessary ambiguity or ad-hoc decisions. It involves the definition of some general model which contains all potentially important variables, and then, via a series of step-wise statistical tests, the removal of empirically unimportant variables to arrive at the proposed specific or final model. The domestic drivers found to explain the attractiveness of FDI inflows in the region take the form of past FDI inflows, the supply and quality of human capital, the market growth prospects, the quality of infrastructure, competitiveness, the corporate tax system, the risk premium, the openness of trade and geographical proximity to Western Europe, the integration in the EU accession process, and the progress in the implementation of structural reforms (related mainly to large scale privatisations, competition policy, reforms in the banking and financial sectors). On the side of external drivers, macroeconomic and financial developments in the euro area, the global risk environment and global macroeconomic prospects are found to be crucial.

The growth potential of recipient countries is crucial for attracting FDI which in turn contributes further to enhancing economic growth in these economies

Ramona Jimborean and Anna Kelber estimate the impact of FDI inflows on economic growth through a dynamic panel data model. The endogeneity of variables is controlled by using the instrumental variables method and the panel data twostep efficient General Method of Moments (GMM) estimator. According to their findings, a 1% increase in net FDI inflows (in terms of GDP) induces average real GDP growth rate to increase by about 0.18 to 0.23%.

The occurrence of the 2007 and 2011 crises is taken into account. It is shown that, during the 2007 crisis, FDI inflows not only continue to have a positive impact on economic growth but this impact becomes even larger. However, this does no longer hold for the 2011 crisis period during which the impact of FDI inflows on economic growth becomes non-significant.

Given the positive impact of net FDI inflows on economic growth, host countries from Central and Eastern Europe could continue to encourage, to a certain extent, the entry of FDI flows. As privatisation has ceased to be the main driver of FDI in the region, economic features attracting non-privatisation-related FDI are becoming increasingly more important. In addition, a stable macroeconomic environment, labour costs that develop in line with productivity, and a sufficiently developed infrastructure, all identified by the results, are preconditions for future FDI inflows.

Interest rate uncertainty

Istrefi (K.) and Mouabbi (S.) "Subjective interest rate uncertainty and the macroeconomy: A cross-country analysis", *Journal of International Money and Finance* (forthcoming).

Sarah Mouabbi is a research economist in the Monetary and Financial Analysis division at the Banque de France. She joined the Bank in 2014, after completing her Ph.D. in Economics at Queen Mary University of London. Her research interests revolve around financial economics, monetary economics, asset pricing and term structure models. She has taught at Queen Mary University of London and Paris Sciences Po.

> **"Interest rate uncertainty – of the size observed during the recent crisis – decreases industrial production by up to 3.8% and CPI inflation by up to 1 percentage point."**

Interest rates play a key role in the transmission of monetary policy decisions to the economy. How does uncertainty about the future path of interest rates affect the economy? Klodiana Istrefi and Sarah Mouabbi present a measure of subjective interest rate uncertainty and explore its effects on the economy for G7 countries, Spain and Sweden, during the 1993-2015 period. They find that subjective interest rate uncertainty is harmful to the economy, with both recessionary and deflationary effects. Central banks can play an important role in mitigating interest rate uncertainty by designing strategies to enhance transparency and communication.

In the past decade, nominal and real interest rates have been remarkably low. Major central banks decreased their policy rates to unprecedented low levels in response to the 2008 financial crisis and then kept them low for a long time. As economies are recovering, markets are speculating on the timing and size of future interest rate increases. It is therefore important to measure interest rate uncertainty and quantify its effects on the economy.

Measuring interest rate uncertainty

Klodiana Istrefi and Sarah Mouabbi explore this issue in a cross-country analysis. They construct a new measure of interest rate uncertainty for G7 countries, Spain and Sweden for the 1993-2015 period. This measure summarises the uncertainty about future interest rates of professional forecasters in public and private economic institutions and comprises of two components: (i) disagreement between forecasters and (ii) the time-varying variability of the average forecast errors.

Professional forecasters have different views on the level of future economic variables, including interest rates. For example, even if their assessment of future interest rates is based on the same publicly available data, forecasters can interpret the data in different ways, leading to different predictions, and thus disagreement, which is captured in the first component. The second component captures how difficult it is, for all forecasters, to predict future interest rates.

Interest rate uncertainty fluctuates substantially over time

The United States displayed particularly high levels of interest rate uncertainty around the post dot-com bubble and after the 9/11 in 2001 attacks. Spikes in uncertainty are also observed for all countries during the Great Recession of 2008. Interest rate uncertainty is at its lowest from end-2008 for the United States, and from mid-2013 for the euro area. This muted uncertainty reflects low levels of disagreement between forecasters about the future path of short-term interest rates as well as a low variability of forecast errors. Indeed, during these periods, nominal policy interest rates reached levels close to zero (and even modestly below in some cases), and central banks communicated forward guidance that policy rates would remain low for a long time.

Interest rate uncertainty is harmful to the economy

The authors find that uncertainty about the future path of interest rates is harmful to the economy. Interest rate uncertainty – of the size observed during the recent crisis – decreases industrial production by up to 3.8% and CPI inflation by up to 1 percentage point (pp) while increasing unemployment by up to 1.2 pp. Furthermore, the recovery of the economy is slow, taking about 3 to 5 years. Due to these large, negative and persistent effects, central banks are careful and continuously monitor the evolution of market expectations. They design operational frameworks that help structure their communication and avoid unnecessary interest rate uncertainty. They also revise language in reaction to the evolution of expectations. For example, during the Great Recession, many central banks across the world communicated forward guidance policies that helped reduce uncertainty about the future path of short-term interest rates.

Trade networks: how do they work?

Berthou (A.) and Ehrhart (H.) "Trade networks and colonial trade spillovers", *Review of International Economics*, Vol. 25, Issue 4, p. 891-923, September 2017.

Antoine Berthou joined the Banque de France in 2011 and currently works as a researcher in the International Macroeconomics Division. He graduated in 2008 from the Paris School of Economics, University Paris I Panthéon-Sorbonne, and holds a Ph.D in Economics. He worked at CEPII between 2008 and 2011. His research focusing on the behaviour of exporting firms has been published in journals such as the *Journal of International Economics*, the *World Bank Economic Review*, the *Scandinavian Journal of Economics*, or *The World Economy*.

> **"European Union countries trade about 50% more with former French and British colonies than would be predicted by a "gravity" framework."**

Business networks are probably one of the most prominent forces shaping international trade flows. They help to explain aggregate trade patterns as well as the transmission of shocks across borders. Understanding how these trade networks are formed and how they function is therefore of great interest for researchers and policy makers.

Colonial trade linkage as a trade network

Antoine Berthou and Hélène Ehrhart investigate this topic through the lens of the economic relations between two former colonial empires, France and the United Kingdom, and their former colonies. A well-established fact is that former colonies trade more with their former coloniser (compared with other countries) than would generally be expected from the geographical distance between the countries and their relative economic size. Researchers refer to this fact as "colonial trade linkage".

The authors find that the British and French former colonies still trade at least three times more with their former colonisers than predicted from the geographical distance between the countries, their language, trade policies or economic size, although the strength of this link has been declining over time. In addition to preferential trade policy or monetary agreements, this empirical pattern has also been attributed to the existence of informal institutions taking the form of rules and practices facilitating business, some of which have survived since the decolonisation process.

Economic theory in international trade predicts that trade networks can expand over time, as firms establish new relationships, starting with their network of clients and suppliers, and learn about new trade opportunities. However, as in the case of social networks, establishing causality in the development of trade networks remains challenging. To solve this problem, the long-lasting trade relationships between colonisers and their former colonies can be used as an "instrument", as the decision to colonise in the past is unlikely to have been driven by the trade opportunities with third countries today.

Colonial trade spillovers and the expansion of a trade network

The study shows that colonial trade linkages fostered the creation of new trade relations with third countries, and in particular with the neighbours of two large former colonisers: France and the United Kingdom. In the paper, this effect is called "colonial trade spillover". While the method employed does conclude that colonisation has an impact on the geographical distribution of former colonies' exports and imports, the paper does not explore the question of the consequences of colonisation on aggregate export performance.

A key finding is that European Union countries trade about 50% more with former French and British colonies than predicted by a "gravity" framework. The geographical distance of third countries from the coloniser is found to be a strong determinant of former colonies' exports and imports with those countries, affecting the probability that a trade relationship will exist and the intensity of this relationship, especially in terms of the number of products exported and imported.

While these findings provide a broad picture that is consistent with the existence of a colonial trade spillover, it is also possible to test more specifically for the *formation* of a trade network *over time*. Using highly detailed trade data, Antoine Berthou and Hélène Ehrhart find that trading - a certain product with the former coloniser increases the probability that this product will also be traded with the former coloniser's neighbours in subsequent years, or with countries that have a high degree of economic integration with the former coloniser (e.g. they share the same currency or have signed a free trade agreement with that country). These results are robust to variations in the set of products exported or imported by former colonies.

This work on the formation of trade networks improves our understanding of how shocks are transmitted across borders. For final goods, a decline in export opportunities due to a reduction in demand from an important trade partner, or the implementation of a more restrictive trade policy by this trade partner, may lead to a decline in export opportunities to third countries. Similarly, the transmission of productivity shocks experienced by suppliers along the so-called "global value chain" may have important implications for the competitiveness of a country outsourcing a substantial part of its gross production abroad.

How network and service anticompetitive regulations impact productivity growth in all industries

Gilbert Cette, Jimmy Lopez and Jacques Mairesse, 2017, "Upstream Product Market Regulations, ICT, R&D and Productivity", *Review of Income and Wealth, Special Issue: Productivity Measurement, Drivers and Trends*, 63(s1), S1-S199.

Jimmy Lopez is a consulting advisor at the Banque de France and assistant professor of Economics at the Université de Bourgogne. He completed his Ph.D. in Economics at the École des Hautes Etudes en Sciences Sociales in 2011. He has conducted empirical investigations on panel data, focusing on market regulations, information and communication technology, innovation and productivity. He has published in a number of reviews, such as the *American Economic Review*, the *Economics of Innovation and New Technology journal* and the *Review of Economics and Statistics*.

> **"Anticompetitive regulations in service and network industries have a strong negative impact on R&D capital stocks and a smaller negative impact on ICT capital stocks."**

Gilbert Cette, Jimmy Lopez and Jacques Mairesse look at how regulations in service and network industries influence productivity growth, focusing on the role of Research and Development (R&D) and Information and Communication Technology (ICT). They find that pro-competitive reforms may strongly increase R&D capital stocks, and to a lesser extent ICT capital stocks, in industries that use regulated intermediate inputs intensively, leading to important productivity improvements.

Competitive pressures: a driver of productivity

Competition –and policies affecting it– is an important determinant of productivity growth in recent empirical research. Empirical evidence supports the idea that competitive pressures are a driver of productivity, enhancing innovation and adoption, especially for incumbent firms that are close to the technological frontier. Indeed, competition reduces firms' profits, so these firms must innovate to restore their mark-up.

Based on these results, since the 2008 financial crisis, international institutions such as the IMF, the OECD, etc. strongly recommend reforming the regulations in service and network industries, for example, reducing barriers to entry, quotas and exclusive rights in regulated professions (legal, accounting, engineering, and architecture professions). Gilbert Cette, Jimmy Lopez and Jacques Mairesse look at how the regulations in service and network industries influence the productivity growth of all industries. They examine the link between industries and estimate the role of R&D as well as ICT.

The authors highlight two main channels from service and network industries to other industries: (i) these regulations can reduce competition in the other industries if access to markets requires using intermediate inputs produced by the service and network industries; (ii) regulations that increase suppliers' market power can reduce incentives to improve efficiency, given that part of the (possibly temporary) income that firms expect to derive from such improvements will have to be shared with the suppliers of the intermediate inputs.

An identification strategy based on the link from production to consumption

The identification strategy of the authors is based on this link from production to consumption of intermediate inputs, most of the service and network industries' production being used as intermediate inputs. They test whether the effects of anticompetitive regulations are growing with the intensity of the use of the regulated intermediate inputs. The empirical investigation carried out on country-industry panel data covers 14 OECD countries, 13 manufacturing and service industries over the 1989-2006 period. The authors first look at the impact of regulations on R&D and ICT capital stocks, then estimate to what extent these two channels account for the impact of regulations on productivity through a knowledge production function framework. More precisely, they use this framework to estimate the effect of R&D and ICT on productivity as well as the effect of regulations not already taken into account by these capital stocks.

An analysis based on the OECD indicators of anticompetitive regulations

This investigation mobilises the OECD indicators of anticompetitive regulations. These indicators attempt to measure to what extent, competition and firm choices are restricted where there are no *a priori* reasons for government interference, or where regulatory goals could plausibly be achieved by less coercive means. They are based on detailed information on laws, rules and market and industry settings, which are classified into two main areas: state control, covering specific information on public ownership and public control of business activities, and

barriers to entrepreneurship, covering specific information on legal barriers to entry, market structure and industry structure. Six industries are concerned: energy (gas and electricity), transport (rail, road and air), communication (post, fixed and cellular communication), retail distribution, banking services and professional services. Undoubtedly, they constitute the most regulated and sheltered segments of OECD economies, whereas few explicit barriers to competition remain in markets for the products of manufacturing industries.

Strong impact of anticompetitive regulations on R&D capital stocks

Gilbert Cette, Jimmy Lopez and Jacques Mairesse find that anticompetitive regulations in service and network industries have a strong negative impact on R&D capital stocks and a much smaller negative impact on ICT capital stocks. There is also a large impact of anticompetitive regulations in addition to that through ICT and R&D capital accumulation. The potential effects of a huge set of reforms in 2007 are computed according to these estimation results. This set of reforms corresponds to a switch to the smallest value of the anticompetitive regulations OECD indicator among the estimation sample for each of the 6 service and network industries. In the long run, average R&D capital stocks would increase by 54.6% and average ICT capital stocks by 2.3%. Labour productivity would increase by 6.0%, and 74% of the impact on labour productivity would be through the R&D and ICT channels.

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