MACROECONOMIC RISK CHAIR
NEWSLETTER N°10

The fifth annual lecture of the Macroeconomic Risk Chair was held online on May 19, 2022, with **Laura Veldkamp** (Columbia Business School) as special guest speaker. Following this lecture, we had the opportunity to interview her about her research. On September 15, 2022, a round table was also organized during the Annual Conference of the Chair, **featuring Klaus Adam (University of Mannheim), Giancarlo Corsetti (EUI) and Martín Uribe (Columbia University).**

This newsletter also presents **two research papers**, on exchange rate policy and on the effects of monetary policy across the income distribution.

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Macroeconomic Risk

Data and the changing economics of knowledge production

AN INTERVIEW WITH LAURA VELDKAMP

On May 19, 2022, **Laura Veldkamp** (Columbia Business School) gave an online lecture on the changing economics of knowledge production. Following this lecture, we had the opportunity to interview her about her research.

NOTE

The video replay of Laura Veldkamp's lecture is available online.

AS A STARTING POINT, COULD YOU FIRST GIVE US AN ECONOMIC DEFINITION OF DATA?

Data is any information that has been digitized. Of course, that is a very broad definition. It includes poetry that is typed, an NFT of artwork, a patent filed online. The big data revolution is not really about these ideas that happen to be digitized; it is about a narrower class of data. Most of the economic data that powers new data technologies is evidence of economic activity. It is transaction records, images of cars in stores' parking lots, search histories and the like. When people talk about data as the new oil, they probably mean this narrower class of data.

WHAT ARE THE HISTORICAL TRENDS DRIVING THE CONTEMPORARY SURGE IN THE ABUNDANCE OF DATA? WOULD YOU SAY THAT WE ARE LIVING A NEW INDUSTRIAL REVOLUTION?

Yes, data is fundamentally reshaping our economy, in a way that is similar to the industrial revolution. This shift was driven by three concurrent forces: more efficient data storage technologies, faster processors and breakthroughs in data science. Each of these innovations fed on the others. New techniques in data science were made possible by more powerful processors. These new techniques required vast amounts of data, which created the need for larger data storage facilities. Each advance creates the incentive and the possibility to advance in the other dimensions.

All this data is transforming economic activity that creates knowledge. The industrial revolution increased the amount of capital each worker worked with: Instead of using a few tools, a worker would have an assembly line and large industrial machines. These new tools made the worker more efficient. Similarly, the data revolution increases the amount of data each knowledge worker works with: instead of using a few pieces of information, perhaps in an Excel spreadsheet, with a high degree of worker judgement about which series to use and how to combine them, a modern data worker will draw on thousands of data series, and let the algorithm combine that information in the optimal way. With new technologies, a given knowledge worker can generate more forecasts, more investment recommendations, more accurate marketing insights, with less labor and more data.

> "With new technologies, a given knowledge worker can generate more forecasts [...] with less labor and more data."

IN YOUR PRESENTATION, YOU EXPLAINED HOW YOU ESTIMATED THE IMPACT OF ARTIFICIAL INTELLIGENCE (AI) ON THE PRODUCTION OF KNOWLEDGE BY THE FINANCE INDUSTRY, USING DATA ON ONLINE JOB VACANCIES. CAN YOU TELL US A BIT MORE ABOUT YOUR METHODOLOGY?

We can tell which firms are adopting AI because these firms post job vacancies, asking for workers with AI-related skills. We impute how much data these AI adopting firms have and how much data non-AI firms have by counting the number of workers they hire to maintain and manage their data sets and measuring how much they are paid. Firms with more valuable data should hire more data managers and pay them more, to get the full value out of their data. Then, we look to see if the AI firms are using more data per knowledge worker, than the non-AI firms are. We find a large difference, telling us that the data-labor ratio is substantially higher for firms that adopt AI technologies.

WHY IS IT KEY TO INCORPORATE DATA IN MACROECONOMIC MODELS? WHAT CAN WE LEARN FROM DOING SO?

The most valuable firms in the world have data as their most valuable asset. Data is a source of revenue, a source of market power and a source of risk. If we cannot understand what makes the most valuable firms valuable, it is hard to say that we really have an understanding of the macroeconomy. Without data, macroeconomics is really about an industrial economy, in an era that has passed.

GDP ONLY MEASURES PRODUCTION LEADING TO ECONOMIC TRANSACTIONS. HOWEVER, DATA IS GENERALLY PRODUCED BY USERS FOR FREE. WHAT ARE THE IMPLICATIONS FOR GDP MEASUREMENT? FOR THE TAXATION OF OUTPUT PRODUCED BY DATA? SHOULD USERS BE COMPENSATED FOR THEIR PRODUCTION OF DATA?

Many digital services, like searches, navigation, games, data apps, are valuable services for those who use them. Customers are willing to pay for these services. Yet, we do not count any of these services in GDP because they are typically given away at zero price. That is an enormous gap in our measurement of economic activity. These services are not really free. Customers pay for them with data. When I use a map, I benefit from the digital service. In return, I allow the map provider to track my location. That's a transaction. It is not obvious that I need to be paid for my data, above and beyond the service provided to me. However, this transaction is not taxed. If we had reliable ways of valuing data, it would be consistent to tax this transaction at the value of the data payment, just like a country taxes all other transactions.

IS DATA AN ASSET? HOW SHOULD INDIVIDUAL BUSINESS VALUE THEIR STOCK OF DATA?

Yes, data is absolutely an asset. It has value. In many cases, it can be bought and sold. It depreciates, as do most assets, although perhaps faster than something like a building or piece of equipment. Valuing this asset is not an easy task. If it is purchased, the transactions price is a good indicator. But many firms profit from their own data. The cost of the data may not be a good indicator of its value, because most data is a by-product of some other economic transaction. I am working on a variety of approaches for valuing different types of data. But I do not think there will be a one-tool-fits-all approach to valuing all data for all firms. We will need a whole suite of tools for this task.

> "Data is an asset. It has value. It depreciates, as do most assets, although perhaps faster than something like a building or piece of equipment."

HOW DOES DATA CHANGE THE NATURE OF COMPETITION BETWEEN FIRMS? SHOULD WE WORRY THAT THE DATA ECONOMY IS INCREASING THE MARKET POWER OF INCUMBENT, DATA-RICH FIRMS? SHOULD THE STATE INTERVENE TO ALLOW FOR A MORE EQUAL ACCESS TO DATA?

Yes, data helps big firms to grow bigger. These large firms naturally generate more data because they do more transactions. They can also benefit more from data because they have more margins on which to adjust. At the same time, these large firms use data to operate efficiently. Efficient operations benefit firms, as well as consumers. In many cases, even the large data monopolists are still charging low, competitive prices for their goods. The fact that they are getting very rich does not, by itself, pose a problem. The question is whether they are harming customers. I do not see that on the consumer side. However, if you think of the customer of a data platform as being a small business that needs to sell their good on that platform, there is more evidence of some harm being done to these small businesses. But the evidence is mixed. I would be very careful not to institute regulations that bring down tech firms' profits, at the expense of consumer choice, convenience and lost savings. I worry that imprudent regulation could be a lose-lose proposition.

FINALLY, HOW DO YOU THINK THE INCREASED USE OF DATA WILL AFFECT THE BUSINESS CYCLE? SINCE DATA REDUCE UNCERTAINTY, AND THEREFORE HELP STABILIZE THE MACRO-ECONOMY, WOULD YOU SAY THAT CRISES ARE A THING OF THE PAST?

Data will definitely not eliminate crises. Data science uses past trends and correlations to extrapolate into the future. Most economic crises arise when something unforeseeable happens. Crises are events that are unlike the preceding events. Such events are difficult, if not impossible to predict, without a true understanding of the changes taking place in the economic system. As of now, this type of forecasting is still well beyond what data science can do.

Laura Veldkamp is a Professor of Finance at Columbia University's Graduate School of Business and is a former editor of the Journal of Economic Theory. Professor Veldkamp earned a B.A in applied mathematics and economics from Northwestern University, and a Ph.D. in economic analysis and policy from Stanford Graduate School of Business. Prior to joining Columbia, she taught at NYU for 15 years. She is a faculty research fellow for the National Bureau of Economic Research and the Centre for Economic and Policy Research, and a frequent consultant for the New York and Minneapolis Federal Reserve Banks. She is also the author of the textbook, Information Choice in Macroeconomics and Finance (Princeton University Press). Professor Veldkamp's research focuses on how individuals, investors, and firms get their information, how that information affects the decisions they make, and how those decisions affect the macroeconomy and asset prices. Her recent work examines the data economy and the value of data as an asset.

Exchange rate policy and firm heterogeneity

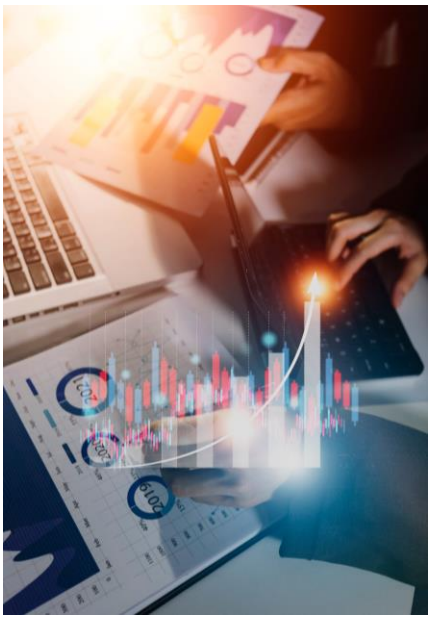
Hamano, Masashige (Waseda University), Pappadà, Francesco (Paris School of Economics and Banque de France),
Exchange rate policy and firm heterogeneity, Macroeconomic Risk Chair Working Paper n°2022-07, September 2022.

In a recent contribution, Obstfeld (2020) looks back at "The Case for Flexible Exchange Rates" made by Harry G. Johnson in 1969, and explores whether his argument survives the most recent academic critiques of exchange rate flexibility. He concludes that none of the arguments against exchange rate flexibility convincingly undermines the case for a flexible exchange rate. Nonetheless, policy-makers have recently adopted exchange rate policies aimed at limiting the fluctuations of the exchange rate, as documented in Ilzetzki et al. (2019). In this paper, Masashige Hamano and Francesco Pappadà provide a rationale for managed exchange rate policies that protect industries and workers in the export market from exchange rate fluctuations.

> When firms are large and more heterogeneous, the optimal monetary policy responds less to external demand shocks, letting the exchange rate free to float.

The main contribution of this paper is to highlight the unexplored role of firm heterogeneity and nominal rigidities on the exchange rate policy trade-offs. In this economy, external demand shocks produce fluctuations in the nominal exchange rate that modify the selection of exporter firms. When firms are small on average and homogeneous in terms of productivity, the fluctuations on external demand may induce a large fraction of firms to enter or exit the export market. In presence of wage rigidity, large fluctuations in external demand translate in high wage mark-ups. In this context, the optimal exchange rate policy reduces the fluctuations of the nominal exchange rate and hence the uncertainty in the export market. These results therefore suggest that a *managed* exchange rate is welfare improving when firm heterogeneity is low, that is when many firms are subject to fluctuations in external demand. Instead, when firms are large on average and more heterogeneous, the benefits of dampened fluctuations in the exchange rate do not compensate for the costs associated with the high wage mark-ups of domestic firms. The optimal monetary policy therefore responds less to external demand shocks, letting the exchange rate free to float.

The two-country setup of this paper fits the description of two large economies (e.g. US and China) which both attempt to manage exchange rate fluctuations in favor of their own exporting sector. Further, this model relates to the case of one economy that has to choose the exchange rate policy vis-a-vis the currency of its main trade partner. For instance, consider the



case of a country outside the Euro Area, which exports all of its goods in the Euro Area with producer currency pricing. This country has to choose whether to let its exchange rate to freely float with respect to the euro, rather than manage it or peg. This model shows to what extent demand fluctuations and the size of the exporter extensive margin may affect the choice of the exchange rate policy in the presence of nominal rigidities and imperfect financial markets. In particular, it shows that there might be an incentive for policymakers to use actively the exchange rate policy to insulate the demand in the trade sector from exchange rate fluctuations.

The Curious Incidence of Monetary Policy Across the Income Distribution

Broer, Tobias (PSE, IIES, Stockholm University and CEPR), Kramer, John (IIES, Stockholm University), Mitman, Kurt (IIES, Stockholm University, CEPR and IZA),
The Curious Incidence of Monetary Policy Across the Income Distribution, Macroeconomic Risk Chair Working Paper n°2022-08, September 2022.

How does monetary policy intervention affect the earnings and employment prospects of individuals across the income distribution ? Does the unequal incidence of monetary policy across the distribution amplify or dampen the response of aggregate consumption to changes in interest rates or future consumption ? The burgeoning heterogeneous-agent New Keynesian (HANK) literature has identified labor income as an important channel through which household heterogeneity impacts the transmission of monetary policy. Answering the foregoing questions is key to understand the transmission of monetary policy to the aggregate economy. However, the literature is still lacking direct empirical evidence on these transmission channels.

In this paper, Tobias Broer, John Kramer and Kurt Mitman first study empirically the heterogeneous effects of monetary policy surprises on labor earnings across the income distribution. Using high-frequency data on labor earnings and labor market status from Germany, they show that monetary policy has significantly larger effects on the earnings of low-income workers. This is mainly because their job-loss risk responds more strongly to changes in interest rates than that of high-income workers. This unequal incidence significantly reduces income inequality in response to monetary expansions and has long-lasting effects on employment rates of poor workers, which remain elevated even years after the initial shock. In particular, the authors find that an unexpected interest rate cut leads the Gini coefficient of labor earnings to fall significantly. In addition, monetary policy has significant effects on medium-run employment prospects: individuals who become un-employed in the month of a monetary policy expansion find jobs significantly faster, have significantly higher earnings, and remain employed significantly longer.

> Monetary policy has significantly larger effects on the earnings of low-income workers because their job-loss risk responds more strongly to changes in interest rates.

The authors then use a structural model to show how this heterogeneous incidence of monetary policy strongly amplifies its effect on aggregate demand. Relative to a model where unemployment risk is homogeneous across the distribution, heterogeneous incidence further amplifies the unemployment-risk channel because monetary policy affects more strongly the riskier workers who account for the bulk of precautionary savings. This positive association of level and cyclicality of risk in the cross-section makes aggregate precautionary savings more responsive to monetary policy. Their analysis suggests quantitatively important results: consumption increases by about a third after a monetary policy intervention.

Why is the Euro Falling Relative to the Dollar?

Roundtable of the Annual Conference of the Macroeconomic Risk Chair at Paris School of Economics
Klaus Adam (University of Mannheim), **Giancarlo Corsetti** (EUI), **Martín Uribe** (Columbia University). Moderated by **Gilles Saint-Paul** (PSE, ENS-PSL)

A BRIEF INTRODUCTION BY G. SAINT-PAUL

The euro has been depreciating vis-à-vis the dollar since July 2021 and this is a challenge for our theories in macroeconomics. Let us begin with the Mundell-Flemming model. Divergence in monetary policies implemented on both sides of the Atlantic leads to changes in the exchange rate depending on who is conducting the tightest policy. The Federal Reserve (Fed hereafter) has been the first central bank implementing contractionary policies. It started tapering in December 2021 and increasing rates in March 2022, whereas the European Central Bank (ECB hereafter) implemented its first rate hike in July 2022: in the standard Mundell-Flemming theory, this would lead to an appreciation of the dollar. However, this theory is not enough to fully understand the on-going depreciation, as the euro actually started depreciating vis-à-vis the dollar even before the Fed moved first in tightening its monetary policy. The purchasing power parity (PPP) theory of exchange rate, which explains fluctuations in exchange rate by differences in inflation, is another candidate. One could indeed explain the depreciation of the euro vis-à-vis the dollar by higher inflation rate in Europe than compared to the United States. However, this theory does not match the data on current inflation rates on both sides of the Atlantic. **If it's not the monetary stance neither the PPP theory, how can we explain the on-going depreciation of the euro against the dollar?**

CENTRAL BANKS IN ACTION

The panellists agreed on the Mundell-Flemming theory to actually be relevant to explain the on-going depreciation of the euro against the dollar. M. Uribe underlined the need to look at the fluctuations of the euro-dollar exchange rate with a more historical perspective. Indeed, the euro- dollar exchange rate has been fluctuating between 1.1 and 1.2 dollar for one euro over the last years (2018-2022), so the depreciation between July 2021 and March 2022 was not that surprising. As for the unusual part of the current depreciation, when the value of one euro fell below 1.1 dollar, it started when the Fed tightened its monetary policy. On top of that, as the exchange rate is a forward variable, it seems reasonable that the euro-dollar exchange rate internalized early the divergence in monetary policy stances.

Agreeing with M. Uribe, G. Corsetti added that the path of the interest rate in the US is much more contractionary in the US than in Europe. Finally, K. Adam underlined the fact that the ECB started later tightening with less forward guidance and that the ECB would probably be more reluctant to increase again rates as it was the case during the last meeting. According to K. Adam, this is mainly due to fear of the debt market and a fragile European institutional set-up, much more exposed to the current war in Ukraine.

Next, G. Saint-Paul mentioned the change that occurred over the last twenty years with the ECB potentially becoming less conservative than the Fed, that is, less averse to inflation. K. Adam pointed at the fact that there are more former finance ministers at the ECB board than it used to, most probably bringing back more fiscal perspectives. Then, M. Uribe highlighted the differences between the two central banks' approaches to fight inflation: while the Fed is making very clear to the fiscal authority that the increase in interest rates is temporary so that it can be deflationary, the ECB has only changed its approach very recently because of fear of weakening some countries within the Euro-zone. This by itself could signal that there is more fiscal dominance in the Euro-Area than in the United States.

EUROPEAN CHALLENGES

G. Corsetti also discussed the issue of political legitimacy in a context where, in order to be independent, the central bank is inherently political. He underlined the fact that after the Great Financial Crisis, the dispersion of the main macroeconomic variables across the American States and across the members of the Euro-Area evolves very differently. Indeed, while the states in the US converged, recovering from the crisis, the dispersion actually increased across countries in the Euro-zone. This increase in heterogeneity across members of the Euro-Area makes it harder for the central bank to implement a monetary policy satisfying everyone, especially in a context where the aggregate fiscal stance has been very insufficient because of the reluctance of some countries

NOTE

The video replay of the entire round table is available online.

in changing their national fiscal stance. G. Corsetti and K. Adam agreed on coming rate hikes by the ECB, with K. Adam explaining that it currently faces a difficult choice: either the ECB decides to be passive in order to make sure governments' finances across the Euro-Area remain stable at the cost of more inflation, or it decides to be active in solving inflation issues while letting the fiscal authorities take care of fiscal matters. According to K. Adam, the last speech by Christine Lagarde signaled a more hawkish tone. In addition, the potential loosening of fiscal rules (coming revision of fiscal rules under the Stability and Growth Pact) at the European Union level might increase the burden of the ECB, making it even harder for the central bank to satisfy its mandate while safe-guarding fiscal stability. All in all, K. Adam and G. Corsetti highlighted the importance of policies that foster growth to make debt sustainable, which is not only a matter of fiscal policies.

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SHORT BIOGRAPHIES

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Giancarlo Corsetti (Ph.D. Yale, 1992) returned to the EUI in January 2022, as Pierre Werner Chair and Professor of Economics, a position he previously held between 2003 and 2010. He was formerly Professor of Macroeconomics at Cambridge University, fellow of Clare College and director of the Cambridge INET Institute. He also taught at the Universities of Rome III, Yale and Bologna. He is a leading scholar in international economics and open macro with pioneering contributions on currency, financial and sovereign crises, monetary and fiscal policy in open economy, and the international transmission and global imbalances.

Martín Uribe is a Professor of Economics at Columbia University and a Research Associate of the National Bureau of Economic Research (NBER). He is editor in chief of the Journal of International Economics. Before joining Columbia, Uribe taught at Duke University and the University of Pennsylvania, and was a Staff Economist in the Division of International Finance of the Board of Governors of the Federal Reserve System. Uribe obtained a Ph.D. in economics from the University of Chicago, a Master degree from CEMA (Buenos Aires, Argentina) and a BA degree from Universidad Nacional de Córdoba (Córdoba, Argentina).

Gilles Saint-Paul, the academic director of the Macroeconomic Risk Chair, is Chaired Professor at Paris School of Economics, Professor at École normale supérieure - PSL, and a Global University Professor at NYU Abu Dhabi. He is also a research fellow of many think-tanks such as the Centre for Economic Policy Research (CEPR). He is a former member of the Council of Economic Advisors to the Prime Minister of France. He served as consultant for various central banks, ministries, and international institutions. His research spans a variety of macroeconomics topics from labor markets to political economy to bubbles to fiscal policy.

COMING NEXT

December 15, 2022
Workshop of the Macroeconomic Risk Chair: "Housing and the Economy"

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is financed by the SCOR Foundation for Science
and is held by the Paris School of Economics

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