

SPEECH

Economics as a profession: from science to practice



Remarks by Benoît Cœuré, Member of the Executive Board of the ECB, at the PSE job forum, Paris School of Economics

Paris, 28 November 2019

It is a true pleasure to be back here at the Paris School of Economics (PSE).

You are now on the home stretch. I well remember how I felt during my own final year: excited, anxious and curious all at once.

Over the next few months, you will need to take serious, life-changing decisions. The data suggest there is about a two-in-three chance that you will pursue further studies.

For many, a master's degree is a natural step towards a PhD. And a PhD is essentially a promise of employment. In the United States, for example, the unemployment rate for PhD economists is about 0.8%, the lowest among all sciences.^[1]
Not a bad place to start from.

But a PhD is not about financial optimisation. Estimates for the United Kingdom suggest that British men with a master's degree earn 23% more than those who could have gone to university but chose not to.^[2] The earnings premium for a PhD, which often takes three to five times as long, is just 26%. For some subjects, the premium for a PhD even vanishes entirely.

So first piece of advice: your PhD should be fuelled by your passion and your love for research rather than by hopes of earning more money.

Money was clearly not the reason for me to join the labour market in 1992 when I graduated from PSE with a Master in Analysis and Policy in Economics.

My first appointment took me to the National Institute of Statistics and Economic Studies, or INSEE, before I moved on to the French Treasury and then, in 2012, to the European Central Bank (ECB).

The path that I chose to explore is just one of many that are open to you. The good news is that the solid training you receive here at PSE makes it your choice.

The world of economics is incredibly broad. I will leave it to the participants of the two roundtables this evening to make a convincing case for their respective institutions, although I would not be surprised if many of you take the lead from the English author G.K. Chesterton who said, "I owe my success to having listened respectfully to the very best advice, and then going away and doing the exact opposite".

But I wouldn't be here tonight if I hadn't planned to use this opportunity to make at least some publicity for the public sector.

Working in the public sector

Working in the public sector – and by this I mean: ministries of economy and finance, statistical institutes, international organisations such as the IMF, World Bank and other development banks, OECD, and central banks such as the US Federal Reserve or the European Central Bank – is probably as close as it gets to applied economics.

It is literally about taking the models, tools and methods that you learn at class to help design public policies. A considerable fraction of that work then ends up being published as new research. So there is a virtuous feedback loop between academia and public sector institutions.

Say's law of markets doesn't necessarily apply to the market for ideas. Supply creates its own demand, but demand also creates its own supply.

Economists at the ECB, for example, have collectively published more than 2,300 working papers over the past 20 years – an average of ten papers per month. Strictly speaking, the vast majority of these economists are not research economists. They are not paid to write papers. They analyse the labour market or price developments, or they design monetary policy instruments. So, to all intents and purposes, their daily work is research.

The ECB is not the odd one out in this respect. Other public organisations work along exactly the same lines. Their collective research has a considerable impact on economics as a science.

For many economists, it is this intellectual curiosity, this ability and opportunity to push out the frontier of innovation that makes institutions like the ECB such an attractive place to work.

The US anthropologist, David Graeber, has claimed that some 40% of workers secretly believe that their jobs need not, or should not, exist.^[3]

I have a strong sense that this number is considerably smaller for public sector economists. But I cannot prove it.

What I can prove to you, however, is the relevance of what you learn here at PSE for the work in an organisation like the ECB.

Central banks as workplace

Monetary policy is a branch of the economics profession that has particularly close ties to your master's curriculum.

Richard Clarida, Jordi Galí and Mark Gertler famously dissected "the science of monetary policy"^[4], even though many central bankers would also call monetary policy an art.

Macroeconomic models underpin almost all of our work at the ECB. This model dependence owes much to how modern central banks define their mandate, and to how monetary policy transmits to the economy.

The ECB, for example, aims at preserving price stability over the *medium term*. That is, we define our mission in a forward-looking manner. And this forward-looking perspective reflects the fact that it takes time – we often say around two to three years, in some cases maybe more – for our decisions to affect prices.

So whenever we decide on monetary policy, we must think of where we see the economy going in two to three years' time.

The forward-looking nature of monetary policy makes the use of models indispensable.

Some of the models we use are very simple, the Phillips curve being a case in point.

Phillips curves are simple: a single equation to forecast inflation conditional on our best guess as to where the economy is heading. As such, they are important in our assessment of whether policy needs change.

But there are many ways to draw a Phillips curve: it can be linear or convex; it can explain price or wage inflation; it can be based on the unemployment rate or on the output gap, or on broader measures of economic slack. And so on.

Equally important, however, are models that help us quantify the impact of our own decisions on prices, growth and financial conditions. These models can be very complex. Without them, we would be unable to calibrate our policies.

For a long time, calibrating policy was a relatively straightforward exercise because there was only one key policy instrument – the interest rate at which commercial banks could borrow from the central bank.

But in recent years, monetary policy operations have become much more complex.

The ECB currently provides monetary accommodation through a broad and complementary set of measures: we have lowered our key interest rates into negative territory, we purchase private and public securities and we explicitly communicate our expectations as to where we see our policy rate in the near future – forward guidance in central bank speak.

It would take a full speech to explain how these measures work in practice.^[5]

Let me give you an example.

When we started purchasing securities, we had no guidance – other than the experience of other central banks – as to how many bonds we would need to buy to bring inflation back to our aim of below, but close to, 2%.

Over time, ECB staff have successfully filled this void. We now have state-of-the-art term structure models that help translate changes in the amount of bonds into changes in long-term interest rates. We know from event studies how policy announcements translate into asset price movements. We have built models of bank intermediation that tell us how tighter funding conditions will impact on bank lending.

That's for the science behind it and that's when art, or rather *artisanat* – craftsmanship – comes in. We need to interconnect these models, and fit them into a general equilibrium view of how the euro area economy evolves dynamically – preferably in a tractable way. We need to know when expert judgment, rather than empirical estimation, has been used.

And when this is all done, we should be able to keep track of the key assumptions we have used, and take some distance.

To quote from Abhijit Banerjee and Esther Duflo: “We, the economists, are often wrapped up in our models and our methods and sometimes forget where science ends and ideology begins. We answer policy questions based on assumptions that have become second nature to us because they are the building blocks of our models but it doesn't mean that they are always correct”.^[6]

We owe this transparency to ourselves as policymakers, and to society as a whole when we communicate our decisions. We don't want to prove right Joan Robinson's remark that “The purpose of studying economics is to learn (...) how to avoid being deceived by economists”.^[7]

Economics as a profession

These examples say a lot about our profession.

They inspire at least four additional pieces of advice that I would like to pass on.^[8]

First, uncertainty is a pervasive feature of our profession.

A first instance of uncertainty is the parameters of our models. To illustrate, let's go back to the Phillips curve.

The “missing” inflation episode of recent years has stirred intense debates on whether the Phillips curve still provides valuable policy advice today. According to conventional Phillips curve estimates, inflation today should be measurably higher.

This raises all sorts of questions that my colleagues are now exploring. Did globalisation change the relationship between domestic output and inflation? Is there an “Amazon” effect – that is, is inflation lower because people can buy cheaper online? Does workers' bargaining power depend on traditional, narrow measures of unemployment or on broader ones including underemployment? Does it depend on the quality of jobs being created? And so on.^[9]

None of these questions have been settled. Our best answer to these challenges today is to look at a range of some 600 Phillips curves to quantify the uncertainty around our baseline outlook.^[10]

Another instance of uncertainty is the nature of the shocks hitting our economies. Should we decide our policies on the assumption that future outcomes will be normally distributed around some expected average? How risk adverse should we be when considering this distribution, or, in other words, should we conduct policy on the basis of expected outcomes or with a view to minimising losses in extreme scenarios, as we request banks to do when we run our stress tests?

So, monetary policy has a lot to do with risk management – as does the economics profession more generally. Economists need to be humble when articulating policy. Every baseline is surrounded by large uncertainty bands and tails can be very fat!

Second, perhaps the defining challenge for our profession is that our understanding of the economy is never settled.

We cannot blindly trust in models, even if they have been running for a long time. Every model is a vastly simplified representation of economic reality, which incurs the risk of misspecification and may result in inadequate policy guidance.

Misspecification, or model uncertainty, is different from parameter uncertainty.

Take the recent financial crisis as example.

I often hear the criticism that economists failed to predict the outbreak of the financial crisis. This criticism is nonsense.

Or do we expect physicians to predict illnesses?

We don't, of course. But we expect them to help us cure illnesses.

Economists should do the same. They should be judged by the quality of the advice they give.

In this sense, the crisis exposed at least three shortcomings in central bank models.

The most apparent limitation was the absence of a meaningful financial sector, which left models at a loss to explain the origins of the crisis and its consequences for the economy.

The second limitation was that the prevailing models were built on a standard linear Gaussian set-up and hence proved inadequate to examine shocks on the scale of the global financial crisis.

And the third limitation was that the models did not take into account the lower bound constraint on nominal interest rates, a constraint which started to bind just a few months after the beginning of the crisis and that helps to explain, for example, why fiscal multipliers have been underestimated in the aftermath of the crisis, with tragic social consequences.^[11]

The implication is that our models require regular review and scrutiny in order to remain useful for decision-making. Few models are valid for eternity.

The ECB employs around 400 economists that constantly help develop and improve macroeconomic models for decision-makers. We also have our own "think tank", which cooperates closely with academia, and that provides cutting-edge research on various monetary policy topics.

Thanks to them and others, our general equilibrium models now feature a fully-fledged banking sector that accounts for the presence of financial frictions and that also allows us to analyse the effects of macroprudential policies. Other models address non-linearities and deal with heterogeneity across countries and economic agents.^[12]

And don't forget that central banking is not only about macro-level phenomena.

Bank and financial markets supervisors have to make sense of the complex mesh of principal-agent relationships between lenders, borrowers and financial intermediaries, and to make these contracts incentive-compatible – this requires quite an amount of international organisation and contract theory!

Think of, say, the seminal work by Jean-Charles Rochet and Jean Tirole on credit card schemes as two-sided markets, which we still use today to understand the fast-changing world of retail payments.^[13]

Policymakers are often caught between a rock and a hard place, between the risk of providing too little insurance and let the economy be scarred by shocks, and providing too much of it and create moral hazard – in contract theory parlance, we have to manage trade-offs between ex-ante and ex-post incentives. This applies to issues as diverse as liquidity regulation or the optimal design of some of our monetary policy instruments, such as the Outright Monetary Transactions.^[14]

All of this is work in progress.

Ultimately, the success of policy will always depend on the quality of our models, and the efforts we invest in keeping them up-to-date. And we'll always benefit from drawing from a portfolio of models and comparing their different answers to our questions.

Models are not there to tell the truth, but to help structure the conversation on policies and identify key assumptions. To quote again from Banerjee and Duflo: "The most valuable thing economists have to share is often not their conclusion, but the path they took to reach it".^[15]

As General Eisenhower once said, "Plans are worthless, but planning is everything".^[16]

Third, there are no settled answers to applied questions.

Economics is an empirical science.

Better and increased data, and a parallel rise in computing power, means we now have answers to questions that we could not answer 30 years ago.

Large dynamic stochastic general equilibrium models – the ones that failed to incorporate financial frictions – require the use of involved numerical methods to produce an estimate of the posterior distribution when confronted with the data.

Advances in computing power have allowed the estimation of such models, greatly expanding the tools central banks have at hand to analyse the economy.

Yet, current conventional estimation methods still imply many hours, or even days, of estimation of more complex models that include household and firm heterogeneity.

Your generation will push out the modelling frontier even farther. No doubt, parallel and cloud computing, machine learning and artificial intelligence are already transforming the economics profession.

You will all need to keep up with the pace of technological progress. Economics is life-long learning. Many of the methods and software packages you learn today will be outdated by the time you are mid-way through your career.

At the same time, big data and richer and timelier datasets will help improve the input to our models. ^[17]

The "Billion Prices Project", which was launched by the Massachusetts Institute of Technology (MIT) in 2008, publishes daily online price indices for more than 20 countries where price information is collected automatically through machines from hundreds of retailers.

I would hazard a guess that you will look back with pity on the current generation of economists who have only just started using online and scanner data to improve our short-term forecasts. The sky is the limit.

And, fourth, structural changes perhaps contribute most to making the economics profession exciting, but also challenging.

If you had been working in the ECB's Monetary Policy department in 2014, you would have more than likely contributed to the work on the term structure models I have alluded to previously, or on financial frictions and euro area heterogeneity.

But if you come to work in the ECB's Monetary Policy department in 2021, you will probably be working on the consequences of fintech for financial intermediation, or on the impact of trade wars and dislocating global value chains on price and output spillovers in the global economy.

Your studies today will equip you with the tools to approach such challenges in the future. But you will have to use these tools very flexibly and with an open mind.

Climate change is perhaps the most far-reaching of the challenges facing your generation. It is no coincidence that William Nordhaus was awarded the Nobel Prize in Economic Sciences last year for integrating climate change into macroeconomic analysis.

Central banks are lagging behind the curve and have only just started incorporating the effects of climate change into their models.

Your generation will need to be the driving force behind these efforts.

Central banks cannot be at the forefront in fighting climate change. This is and should remain a political task. But they can help within their mandates.

Low, and even negative interest rates, have implicitly contributed to shorten the “tragedy of the horizon”.^[18] That is, lower discount rates have increased the net present value of those future cash flows that are more likely to be affected by climate change.

At any rate, climate change will affect the conduct of monetary policy in one way or another.^[19]

Without further mitigation, for example, it will become increasingly difficult for central banks to disentangle the variation in the data underlying the assessment of the medium-term inflation outlook.

Consider the German car manufacturing sector, which has experienced a notable decline in activity over the past 18 months or so.

This decline started after the implementation of new carbon dioxide emission standards. But it coincided with a broad-based decline in global aggregate demand due to growing uncertainties about global trade and Brexit.

These effects have very different implications for central banks.

Monetary policy is the appropriate tool to counter weakness in demand so as to keep inflation at levels that are in line with our aim. But monetary policy is not the right tool for addressing a decline in production that reflects a change in consumer preferences, away from fossil fuel-driven cars and towards electrical vehicles.

Central banks will face such identification issues more often in the future. And they will need to think about how they incorporate green and sustainable considerations in their investment behaviour.

The research field is wide and open in this area. But it is also full of challenges. For this reason, and because climate change is an emergency, work on modelling climate change will require strong international collaboration across national and international organisations. If we want to be successful, then we need to start now.

Conclusion

No matter what you take home from tonight, and with this I would like to conclude, as you go out into the world and start your careers, take with you the great experiences and the network of people that this university has on offer.

Life and economics is about people. Keep those friendships going, not only for your careers but for your own wellbeing and to help you become exemplary members of our societies.

And stay humble and critical. Equations and models often induce a false sense of omnipotence. Listen to your hearts and conscience. Always keep in mind that economics is a social science. Models will not take away the burden and responsibility of making judgements. Economics involves much trial and error – you have to take decisions in the fog when you can barely see your hand in front of your face. This makes our profession exciting!

With this in mind, I wish you the best of luck.

Thank you.

- [1] Source: National Science Foundation.
- [2] See Casey, B. (2009), "The economic contribution of PhDs", *Journal of Higher Education Policy and Management*, Vol. 31(3).
- [3] Graber, D. (2018), *Bullshit Jobs: A Theory*, Simon & Schuster.
- [4] See Clarida, R., Gali, J. and Gertler, M. (1999), "The Science of Monetary Policy: A New Keynesian Perspective", *Journal of Economic Literature*, [Vol. 37, No. 4](#), pp. 1661-1707.
- [5] See, for example, Hartmann, P. and Smets, F. (2019), "The first twenty years of the European Central Bank: monetary policy", *Working Paper Series*, No. 2219, ECB.
- [6] See Banerjee, A. and Duflo, E. (2019), *Good Economics for Hard Times*, PublicAffairs, Chapter 2.
- [7] Robinson, J. (1955), "Marx, Marshall and Keynes", Delhi School of Economics Occasional Paper, No. 9.
- [8] For a discussion of the limits of knowledge and representation in policymaking, see Benassy-Quéré, A., Cœuré, B., Jacquet, P. and Pisani-Ferry, J. (2018), *Economic Policy: Theory and Practice*, Second edition, Oxford University Press, Chapter 2.
- [9] See Cœuré, B. (2017), "Scars or scratches? Hysteresis in the euro area", speech at the International Center for Monetary and Banking Studies, Geneva, 19 May.
- [10] See, for example, Lane, Ph. (2019), "The Philips curve at the ECB", 50th Anniversary Conference of the Money, Macro and Finance Research Group, London School of Economics, 4 September.
- [11] See Blanchard, O., and D. Leigh (2013), "Growth forecast errors and fiscal multipliers", *American Economic Review*, Vol. 103, No. 1, pp. 117-120.
- [12] See Beyer, A., Cœuré, B., and Mendicino, C. (2017), "The crisis, ten year after: Lessons learnt from monetary and financial research", *Economics and Statistics*, No. 494-495-496, pp. 45-64.
- [13] See Rochet, J.-C. and Tirole, J. (2002), "Cooperation among Competitors: Some economics of payment card associations", *Rand Journal of Economics*, Vol. 33, pp. 549-70.
- [14] See Cœuré, B. (2012), "Central banking, insurance and incentives", speech at the ECB conference on Debt, Growth and Macroeconomic Policy, Frankfurt, 6 December.
- [15] See above.
- [16] Eisenhower, D. (1957), Remarks at the National Defense Executive Reserve Conference, 14 November.
- [17] See, for example, Cœuré, B. (2017), "Policy analysis with big data", speech at the conference on Economic and Financial Regulation in the Era of Big Data organised by the Banque de France, Paris, 24 November.
- [18] See Carney, M. (2015), "Breaking the tragedy of the horizon—climate change and financial stability", speech given at Lloyd's of London.
- [19] See Cœuré, B. (2018), "Monetary policy and climate change", speech at a conference on "Scaling up Green Finance: The Role of Central Banks", organised by the Network for Greening the Financial System, the Deutsche Bundesbank and the Council on Economic Policies, Berlin, 8 November.

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