

Yves Mersch: Economic policy and the need for humility

Speech by Mr Yves Mersch, Member of the Executive Board of the European Central Bank, at the Conference "Banking and Financial Regulation", Bocconi University, Milan, 9 October 2017.

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*"[...] five years from now the dynamic stochastic general equilibrium model that central bankers worship like Baal will still be there. There will be a few changes to the parameters, and maybe a constraint or two added like temple lamps, but apparently they never learn."*¹

John Dizard

The policy maker's environment is a multi-faceted one. She or he faces a continually changing economic landscape. Let me give you some specific examples. Economic data — upon which we base our policy decisions — appear at different times and with different qualities: for instance, some economic series (such as trade and investment data) are subject to considerable revision over time. Moreover, the transmission lags of monetary policy changes are often long, uncertain, and perhaps even contingent on the state of economy (for example whether it is an expansionary or contractionary phase). Last, but certainly not least, policy making itself does not operate in a vacuum or in a laboratory. There is the practical backdrop of legal, constitutional, cultural, and political economy constraints etc.

Experience, judgement and the acknowledgement of uncertainty are key parts of that environment, and key parts of the policy maker's outlook. To help assess economic developments and to facilitate policy discussion, though, central banks use a variety of macroeconomic models and econometric tools.

Despite the sophisticated tools and analysis at our disposal, the uncertainty underlining the policy environment is pervasive. Accordingly, I believe policy makers must show humility in their understanding of how the economy works, and how policy works.

Before the financial crisis many distinguished policy makers and academics treated economics and finance as if it had attained something of a natural science – replete with regularities upon which most economists could, and seemingly did, agree. Indeed, some even declared the business cycle dead. The doubters meanwhile (among them Robert Gordon, Raghuram Rajan, Robert Shiller) were either neglected or – what is worse – labelled luddites.

The global financial crisis challenged such complacency. In effect, it shone a light on our over confidence and, exposed our very lack of humility. More philosophically, the crisis also suggested that we, as a profession, had perhaps lost touch with an older tradition of economics that had precisely sought to emphasise uncertainty, the limits of information, and the wider social context underlining economic interactions — as for instance, highlighted by von Mises and Hayek "economic calculation problem" and Hayek's "fatal conceit" which submits that knowledge is dispersed across society and can never truly be known by any one agent or entity² - a fact that the former chief economist of the ECB, Otmar Issing, never failed to remind us of.

Notwithstanding, the inescapable fact is that policy makers must make decisions under uncertainty. Such uncertainty is not, in addition, a temporary phenomenon that we can wait out. As former Fed Chairman Alan Greenspan (2003) wrote:

*"... uncertainty is not just a pervasive feature of the monetary policy landscape; it is the defining characteristic of that landscape"*³

Given this complexity and the need to stabilize market expectations, policy makers have traditionally relied on a variety of macro-econometric and statistical models. These tools come

with many caveats. Indeed, many were the first to point an accusatory finger at such modelling frameworks in the aftermath of the financial crisis.

The main criticisms were that models were missing key features of the economy (e.g. financial interactions) and/or were based on unrealistic assumptions.⁴ Examples of the latter include the assumption of “complete” and “efficient” markets as well as of “rational” expectations. These features make it difficult for models to speak to real-world phenomena such as herd behaviour in markets, asset price misalignments, sudden stops etc. The overreliance on mathematics and models leads to a failure of acknowledging the crucial role of social behaviour.

Of course, all models make simplifying assumptions, otherwise they wouldn't be models. Or, as the statistician George Box famously noted, “All models are wrong; some models are useful.” Indeed, there is an active research agenda to incrementally but carefully improve our existing models: examples include integrating “financial frictions” and so-called heterogeneous agents which inject more realistic dynamics. Moreover, many have also sought out insights from machine learning and big data techniques, and from behavioural and evolutionary economics. The latter try to explain departures from optimality in agents' decisions, and integrate the social fabric and consumer heuristics underlying economic behaviour. As the economy advances and grows yet more complex, innovation in our modelling and statistical frameworks will undoubtedly continue, but fail in its pretention to encapsulate human complexity in an equation.

The fact that all models are wrong does not preclude their combination from being useful. We know that combining models – even often using simple pairing rules – regularly outperform the best individual model in forecasting exercises. Likewise, the robust policy literature has combined macroeconomic models to ask which types of policies are likely to work well across many different models and scenarios.⁵ This seems a reasonable research agenda, although it is unclear if the models are close to being useful for analysis of macro-prudential and financial stability issues.⁶ Macro-prudential policy is a good example of this pretence lacking even a capacity to define its own objective otherwise than by its negative.

In the remainder of my remarks I will elaborate on the challenges faced by central banks related to uncertainty. I highlight merits and limitations of models, and I comment on different areas that researchers are currently working on.

Monetary policy and financial regulation under uncertainty

Uncertainty is the defining characteristic of monetary policy landscape. The literature distinguishes several types, so it is worth starting by describing it to continue later on how economists have thought about it and how they have tried to tackle it.

First, there is Knightian uncertainty. This is the type of uncertainty that is immeasurable and thus not possible to calculate. Typically it relates to the inability of agents or decision makers to reasonably contemplate all the possible states of nature or characterize their probability distributions. If, on the other hand, the realization of the states of nature is not known in advance but agents can reasonably contemplate all such states and their likelihood, this situation is commonly known as risk (the second type of uncertainty).

Others tend to distinguish between aleatory (or objective) uncertainty and epistemic (or subjective).⁷ Ultimately, all uncertainty relevant for decision making is subjective, but for practical purposes it is worth making the distinction because there are cumulative effects of the two uncertainties that can explain events such as the financial crisis. As Oliver Blanchard commented:

“... what is at work is not only objective, but also subjective uncertainty ... Subjective uncertainty is about “unknown unknowns”. When, as today, the unknown unknowns dominate, and the

*economic environment is so complex as to appear nearly incomprehensible, the result is extreme prudence, if not outright paralysis, on the part of investors, consumers and firms. And this behaviour, in turn, feeds the crisis”.*⁸

Uncertainty can be related to many dimensions relevant to policy making, including (i) uncertainty about the current state of the economy, (ii) uncertainty about its structure; and (iii) uncertainty over the way economic agents form expectations about future developments and future policy actions.

Let me give you some concrete examples of such dimensions relying on unobservables.

First, consider the famous Taylor rule. This relates changes in monetary policy rates to changes in inflation and the output gap, anchored around some notion of the equilibrium real interest rate. By and large, the rule assumes fixed coefficients for these feedbacks. Even though policy makers never mechanically follow such a rule, over a long horizon, it can ex post provide a good description of monetary-policy setting. Policy-making, however, as opposed to academia is forward looking – unless one believes with Karl Marx that history repeats itself as a farce.

Consider now the effect of monetary policy when interest rates are around their effective lower bound. Given the limited experience policy makers have of such episodes, there is deep uncertainty as to whether the normal rules of the game (i.e., the coefficients of the Taylor rule) will continue to provide a broad guide for monetary decisions. Moreover, estimates of potential output and thus the output gap have inevitably been blurred by the scarring of the financial crisis, as well as by rapid technological changes throughout the last decades.⁹ In line with this, at the Bank for International Settlements, Borio has argued that we must supplement traditional measures of output gaps with measures of financial imbalances and credit cycles.¹⁰ There is however no unambiguous way to do this given the many different methods of filtering data and extracting trend and cycle. Moreover, macroeconomic data samples are limited relative to the infrequent nature of crises to make these discriminations. Likewise, forecasts of inflation are increasingly difficult to make in a globalized world: there are many common trends in inflation determinants, and common shocks such as in commodity prices. Accordingly, domestic factors – such as wage setting – may matter far less than before.

Finally, estimates of the so-called natural real rate of interest, always understood to be difficult to pin down, are in an interdependent world beset by many “headwinds” (e.g., population aging, potentially technical deceleration), as argued by Gordon.¹¹ It is very difficult to be able to say how such headwinds will evolve. In the same context other scholars even identify tailwinds: Brynjolfsson and McAfee find that technological advance has caused a drastic shift in the means of production, simultaneously boosting the productivity of firms which are however difficult to measure with traditional gauges.¹²

All of these examples relate to stabilization policy over the cycles – but it goes well beyond that. Consider regulatory policy, given the expansion in recent decades of the financial sector and its changing nature (e.g., the rise of shadow banking, FinTech), the optimal design of regulatory policy in such a changing landscape is profoundly complex.

Uncertainty though does not (and cannot) prevent the central bank from taking informed decisions. How do we ensure that we avoid paralysis? Given the complexity and the need to stabilize market expectations, academics and researchers have traditionally relied on a variety of econometric models. Policy makers supplement these models, with expert judgement to shed light on economic developments.

The use of models inevitably introduces other dimensions of uncertainty which all go under the name of model uncertainty. It is possible to classify *risk* within a model, where the uncertainty is about the outcomes that emerge in accordance with a model that specifies fully the outcome set

of probabilities; and *ambiguity* among models, where the uncertainty is about which alternative model should be used. If the true model is not assumed to be among the original set of models under consideration, a third source of uncertainty emerges, i.e. model misspecification.

Uncertainty has been one very important aspect of the policy environment and of the models used that the economic professions has been forced to think more deeply about with the financial crisis. But many other features of the models have been at the centre of the discussion.

Reflections on the models

Let me now elaborate more fully on policy models. Many prominent economists (from different perspectives) concluded that today's mainstream macroeconomic models somehow had led the profession down the wrong path (Buiter, Krugman, Mankiw, Akerlof and Shiller).¹³ In other words that these models suffer from misspecification. There are also examples in finance: mainstream financial economists possessed an incomplete understanding of the correlation of different assets, perhaps excessive faith in the risk-reducing potential of the securitization and a blinkered Gaussian mind-set.¹⁴ In short they used models – often of great sophistication – but poorly combined them with judgement and experience.

As we noted, many have reached a relatively positive assessment of policy models, and of the re-constructive abilities of the profession. Indeed, some others argued that the mistake was actually in not following models' prescriptions closely enough. For instance John Taylor maintained that during the early 2000s, monetary policy in the US was set looser than that implied by the Taylor Rule. This, he claimed, caused the build-up of debt and risk-taking, which ultimately led to the onset of the Great Recession. Likewise, Michael Wicken concluded that

*“... the financial crisis was brought about more by a failure to employ modern macroeconomics than by its failings. If used sensibly, it will lead us out of the crisis.”*¹⁵

On the other side, those who criticize the types of macroeconomic models popular at central banks have argued that they mistook beauty for truth and were too complex and opaque to be used quickly. More recently Stiglitz posed another question highlighting one important flaw of models: why does the economy not quickly return to full employment, as one would have expected in an equilibrium model? Why do we persist in using models with such strongly counterfactual dynamics? More specifically the list of model troubles could include: linearity, rational expectations, complete markets, limited agent heterogeneity and financial imperfections.¹⁶

On a more general perspective, some set the discussion in terms of the fact that some models give the impression of the possibility to fine tune or socially “engineer” the economy whereas less standard approaches – also inspired by other disciplines – see the economy rather as an ever-evolving social system for which one can merely set the broad framework conditions and institutions. This goes back to an old debate started indeed with Ludwig von Mises, who first discussed the concept of catalaxy, and made popular later on by Friedrich Hayek who elaborated on that concept and defined it as follows: “... the order brought about by the mutual adjustment of many individual economies in a market”. Hayek particularly stressed his view in that respect in his lecture to the memory of Alfred Nobel, *The Pretence of Knowledge* in which he forcefully challenged all those who believed that government had the wisdom or ability to successfully plan the economic affairs of society. His primary targets were the Keynesian economists at that time who were confident that they could manage the economy to assure full employment, economic growth, and market stability. Hayek's more general antagonists were social engineers who wished to redesign and regulate society. The terms of the current debate are similarly along those lines.

Way forward/implications for research and policy

One possible reaction by fine-tuners to this uncertainty is to rely on Machine learning and Big Data techniques to deliver forecasts and enhance policy analysis. As the name implies, such techniques rely on large complex datasets to extract and manipulate correlations and regularities in the data that would otherwise be opaque. They have proved popular and valuable in many fields such as advertising, prediction, developing trading strategies, and so on. Indeed, as the economic historian Joel Mokyr provocatively wrote “... *who needs causation as long as we have correlation?*”¹⁷

Big Data, however intriguing, is no panacea. Such methods rely on often multi-dimensional correlations fitted (perhaps over-fitted!) on past data that may bear little relation to future events. Moreover, the relations uncovered by algorithms trawling vast datasets may identify false positives (in other words, relationships that essentially do not exist in the data and have no real-world justification). But more fundamentally, many problems in social sciences entail a combination of prediction but also causal inference. We need to know for example, if the central bank lowers interest rates below zero or engages in asset purchases, will that stimulate aggregate demand? Central banks have for the most part not engaged in these types of policy before so there is no (or very limited) historical correlation upon which we can fall back.

To address such questions, we inevitably rely on our macro-econometric models to give us structure. During the crisis some believe to have seen many examples of policy insights from models (for example how the policy transmission changes in periods of low activity, high uncertainty and rates near their effective lower bound). Moreover, many interesting extensions were fashioned onto existing models in the wake of the crisis.

However successful such extensions prove to be, there are still clearly (fairly tight) limits on how big policy models can be. The bigger models are, the more difficult it is to estimate and solve them; the more difficult it is to build a coherent narrative around them. Such narratives are an important ingredient in building consensus around where the economy is and how policy should advance. To lose the big picture in the details is not ideal.

The bottom line is that whilst we should acknowledge the contribution our statistical and macroeconomic models make, we must also acknowledge their limitations and make improvements. We must recognize the presence of pervasive uncertainty. We must show humility.

There is hope, and an active research agenda. Useful insights on how to improve models come from behavioural and evolutionary economics (expectations, multiple equilibria, the effects of news, and asset market bubbles) — as well as from the enhancement of models to include commercial banks, credit frictions, and uncertainty. Also, central banks have always been concerned with uncertainty and they always tried to take robust decisions.¹⁸ They have also been confronted with the challenge to distinguish between short-term versus long-term, cyclical versus structural developments or deviations of various degrees versus dead ends. The main problem is the difficulty the policy maker faces in distinguishing between objective and subjective uncertainty, and how to cope with the latter.

Possible solutions to uncertainty are on the one hand to relax the assumption that a single probability number quantifies beliefs and assume that they can account on a set of them. The policy makers then act according to the belief that minimizes the expected loss. On the other hand the risk aversion of policy makers towards the two types of uncertainties is not the same. Allowing for the distinction in the attitude towards uncertainty allows us to evaluate their role and quantify their importance. As already stressed, the crises increased the concern for uncertainty. The research agenda is also high on this topic.¹⁹

Conclusions

If it did nothing else, the financial crisis served to remind us all of a few home truths. The economy is a profoundly complex setting. It is bound and shaped by history as well as by cultural and legal norms. If it can at all be conceived of as a model, such a model would have many moving parts and shifting parameters and volatilities. But even then, deep uncertainty inevitably remains – uncertainty about the underlying mechanisms and parameters and the lines of causality between those mechanisms. Many economists had in recent years perhaps forgotten that, but as I have argued the study of economics and many practitioners had not.

Let me be clear, an acknowledgement of uncertainty is not a recipe for nihilism. On the contrary, the ECB has shown great flexibility and ingenuity in dealing with the financial crisis. For instance, all the available evidence suggests that the range of asset purchases programme has led to material improvements in financial conditions and credit supply conditions in the euro area. The ECB has marshalled its many models and staff expertise to great effect in these last few admittedly difficult years.

Moreover, economists have made a sober assessment of the gaps in their modelling frameworks and made a serious, diligent, and ongoing attempt to fill them whilst retaining model tractability. In this cause we have and will be guided by the proliferation of large and detailed datasets in our macroeconomic and macro-prudential settings. And yet the benefit of experience, judgement, and – perhaps above all — humility remains always to the fore.

¹ Dizard, John (2017). Supply-side shocks confound Fed's economic models, Financial Times, 2 October 2017, p.12.

² Von Mises, Ludwig (1990). Economic calculation in the Socialist Commonwealth. Originally published in German in 1920. Hayek, F. A. (1935). "The Nature and History of the Problem" and "The Present State of the Debate" in F. A. Hayek, ed. *Collectivist Economic Planning*, pp. 1–40, 201–43. Hayek, F. A. von (1974) [The Pretence of Knowledge](#), Lecture to the memory of Alfred Nobel, December 11, 1974.

³ Greenspan, A. (2003). Opening Remarks at "Monetary Policy under Uncertainty," symposium sponsored by the Federal Reserve Bank of Kansas City, Jackson Hole, Wyoming.

⁴ Tovar, C. E. (2008). DSGE models and central banks, BIS Working Papers 258, Bank for International Settlements.

⁵ Levine, P., McAdam, P. and J. Pearlman (2008). Quantifying and sustaining welfare gains from monetary commitment, *Journal of Monetary Economics*, 55(7), 1253–1276.

⁶ Basel Committee on Banking Supervision (2012). Models and tools for macro prudential analysis. BIS Working Papers 21, Bank for International Settlements.

⁷ Marinacci, M. (2015). Model Uncertainty. *Journal of the European Economic Association*, Vol. 13, pp. 998–1076.

⁸ Blanchard, O. (2009). (Nearly) nothing to fear but fear itself. *The Economist*.

⁹ I examined the debate on output gap measurement under technical change between Gordon and McAfee in a previous [speech](#).

¹⁰ Borio, C. (2012). The financial cycle and macroeconomics: What have we learnt?, BIS Working Papers 395, Bank for International Settlements.

¹¹ Gordon, R. J. (2012) Is U.S. Economic Growth Over? Faltering Innovation Confronts the Six Headwinds, NBER Working Paper No. 18315.

¹² Brynjolfsson, E. and McAfee, A. (2011). *Race against the machine: How the Digital Revolution is accelerating innovation, driving productivity, and irreversibly transforming employment and the economy*. Lexington, Massachusetts: Digital Frontier Press.

- ¹³ Buiter, W. (2009). The unfortunate uselessness of most 'state of the art' academic monetary economics. *Financial Times*, 3 March 2009. Krugman, P. (2010). The International Finance Multiplier. *New York Times*, 22 March. Mankiw, N. Gregory (2006). The Macroeconomist as Scientist and Engineer. *The Journal of Economic Perspectives* 20(4), pp. 29–46. Akerlof, G. and Shiller, R. (2009). *Animal Spirits: How Human Psychology Drives the Economy, and Why It Matters for Global Capitalism*. Princeton University Press.
- ¹⁴ There were, of course, also salient exceptions from the rule (e.g. Hartmann, Straetmans and de Vries (2004), Asset market linkages in crisis periods, *Review of Economics and Statistics*, 86(1), 313–326, although the relapse to a normally distributed world seems to be irresistible to the mainstream (e.g. Adrian and Brunnermeier, CoVaR, *American Economic Review*, 106(7), 1705–1741).
- ¹⁵ Wickens, M. (2010). What's wrong with Modern Macroeconomics? Why its critics have missed the point. *CESifo Economic Studies*, Vol. 56, 4, pp. 536–553.
- ¹⁶ Stiglitz, J. E. (2017). Where modern macroeconomics went wrong. NBER working paper 23795. See also the discussion by Kenny and Morgan (2011) in the ECB Occasional Paper series.
- ¹⁷ Mbaye, J. (2017), Is technical progress obsolete?, forthcoming in *Investment and Growth in Advanced Economies*, ECB: Frankfurt am Main.
- ¹⁸ Hansen, L., P. and Sargent, T. J. (2007). *Introduction to Robustness. Introductory Chapters in: Robustness*, Princeton University Press. Marinacci, M. (2015). Model Uncertainty. *Journal of the European Economic Association*, Vol. 13, pp. 998–1076.
- ¹⁹ Hansen, L., P. and Marinacci, M. (2016). Ambiguity Aversion and Model Misspecification: An Economic Perspective. *Statistical Science*, Vol. 31, No. 4, pp. 511–515. Watson, J. and Holmes, C. (2016). Approximate models and robust decisions. *Statistical Science* 31, pp. 465–589.