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Virtual keynote address

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Let me start by thanking Professor Monica Billio and the Italian Econometric Association for their kind invitation to speak at this tenth Italian Congress of Econometrics and Empirical Economics. I accepted their offer with pleasure, not only because of my own academic and applied background in econometrics, but also because I think that this is a critical moment for this discipline and for our profession in general.

Over the past few years, the world economy has been shaken by an unusually long series of sizeable and heterogeneous shocks. The Covid-19 pandemic hit the global economy at a time when some countries, including Italy, were still recovering from the damages inflicted by the global financial crisis and the euro area sovereign debt crisis. Last year, the Russian invasion of Ukraine triggered, especially in Europe, an energy crisis that, coupled with the ensuing disruptions in global supply chains, fuelled an unexpected and prolonged surge in inflation. In advanced countries, inflation rose to an average of 7 per cent, a level unseen over the last 40 years.

Virtually all policy institutions and private analysts have been taken by surprise by the magnitude of the rise of inflation. The unusually large and persistent increase in energy prices, especially the price of the natural gas delivered in Europe, led to repeated forecast errors. These errors, in turn, rekindled a longstanding debate on the reliability and usefulness of the analytical tools and practices used by economists and policy institutions to interpret and predict the trajectory of the economy.

This is not a new debate. In the aftermath of the global financial crisis, several voices claimed that econometric models and techniques were no longer reliable for policy analysis and should be abandoned. This is a position that I have forcefully rejected on several occasions.

Policy decisions must be grounded in careful analysis of all available information on the current state of the economy as well as in the resulting indications for its future evolution. In very complex systems like modern economies, where multiple forces and feedback

mechanisms are simultaneously at play, this analysis would be nearly impossible without the help of adequate measurement, appropriate statistical techniques, and formalised models. It goes without saying, as practitioners know very well, that these are tools that should not merely be used mechanically, that our predictions are not unconditional and, consequently, that good judgment is of the essence.

It is therefore essential that economic and econometric research keep fuelling the analytical machinery available to economic analysts and policy makers. Three decades ago, Lawrence Summers observed that too much effort in econometrics was devoted to somewhat vain methodological innovations, with little use for the understanding of the actual functioning of economic systems. Extreme and provocative as this position may seem, it does underline, however, the fundamental requirement that our research should fulfil, that is to facilitate the understanding of the functioning of the economy and to identify the policy actions needed to improve our countries' welfare.

This requirement is especially pressing in periods of turbulent changes like the most recent ones, when past regularities provide little guidance on the course of future events and traditional indicators prove inadequate to explain current developments. Our experience provides many examples of a fruitful exploitation of the tools provided by econometric research in periods of crisis. A recent and significant example draws from our experience during the outbreak of the Covid pandemic. During the emergency, the information content of many traditional indicators was impaired by the difficulties encountered in data collection and there was a pressing need for extracting signals from heterogeneous and often very "noisy" sources, such as data on electronic payments or google searches. At the Bank of Italy, the effort put into exploiting these new data was intense and, in a matter of literally a few weeks, it led to the construction of new synthetic indicators of economic activity that not only were extremely useful during the most acute phase of the pandemic, but are still regularly applied today in the assessment of the current state of the economy.

Similarly intense efforts are now required to correctly assess the evolution of inflation. In the past year, forecasts have generally miscalculated the rise in inflation even at very short horizons. An important factor, albeit not the only one, in this failure has been the generalised misreading of the consequences of geopolitical tensions on commodity prices, in experts' evaluations as well as in the markets where futures are traded. This was especially relevant for us, as the prices of futures contracts of energy products have proved to be a crucial reference item among the set of assumptions underlying our inflation projections.

As it turned out, futures prices completely misjudged the extent and persistence of the increase in energy prices. It must be acknowledged, however, that in Europe the misjudgement largely reflected the exceptional increase in the level and volatility of gas prices triggered by the war in Ukraine, an event whose scope and duration could hardly have been anticipated without the benefit of hindsight. These considerations, and further analyses, suggest that, although all models should always be subject to continuous checks and improvements, to a large extent forecasting errors were not so much due to flaws in the models used to represent the functioning of the economy, but to the quality of the data used as inputs.

While volatile commodity prices play a predominant part, at least in Europe, in the explanation of the surge in inflation, deciding upon an appropriate policy response requires much more information. In particular, policy-makers, including central banks, need to be able to identify as closely as possible the relative contribution of the different drivers of inflation, as well as to anticipate both the likely evolution of these drivers and the quantitative effects of the policy actions they are implementing. In this respect, approaches aimed at assessing the relative weight of demand and supply factors in explaining inflation are especially important.

This assessment, however, should be combined with a convincing narrative of the mechanisms, behaviours and institutional frameworks that shape the transmission to the macro-economy of the shocks and of policy responses. In this respect, we should consider to what extent we are able to make use of the insights provided by analyses based on stationary statistical frameworks, for instance structural VARs, regardless of how carefully they have been identified. This does not mean that a reasoned recourse to such tools would not be useful per se, as they could provide significant reference scenarios. It does, however, mean that we must devote considerable attention in the evaluation of economic phenomena to stationarity, or ergodicity, issues.

The Bank of Italy, as other central banks, relies heavily on semi-structural macro-econometric models to interpret past developments, anticipate the course of events that are likely to follow a given combination of shocks, and assess the consequences of policy decisions. Such models provide a good fit for the data while preserving properties that are consistent to well-known and generally accepted economic mechanisms. They therefore offer indications that are both well-grounded in available information and persuasive from a theoretical standpoint, notwithstanding the important critique by the late Robert Lucas.

Also in this case a major challenge for empirical analysis conducted on the basis of models, which is at the root of potential forecast and policy failures, is clearly represented by the possible discontinuities related to shocks of unprecedented size and nature. In the face of such discontinuities, all empirical models whose parameters are based on past regularities, irrespectively of whether they are estimated or calibrated, will inevitably provide distorted predictions. But models with a sufficiently rich and detailed structure can offer at least two advantages. First, they can be used to inspect the sources of forecast failures and selectively modify the mechanisms that are no longer valid under a different economic structure. Second, they can relatively easily accommodate the use of external information and evidence provided by alternative or satellite models, including that coming from micro-econometric studies.

This said, our models are less well-endowed to provide a convincing assessment of the uncertainty surrounding economic forecasts. Generally, in such models uncertainty is measured by relying on re-sampling of past forecast errors. However, a characterisation of forecast uncertainty in the presence of structural changes or due to shocks of unprecedented magnitude is extremely difficult. A typical example is represented by the decoupling of oil and gas prices observed in 2021-22, an event that has never previously occurred.

Although we have faced significant challenges thus far, further and perhaps more difficult hurdles still await us. Climate change and the transition to a low-carbon economy, the risks posed to the multilateral framework of economic and financial integration that emerged after the Cold War, now jeopardised by the current geopolitical tensions, as well as the rapid advances in digital technologies and recent impressive developments in artificial intelligence, all have the potential to bring about fundamental changes in the functioning of our economy.

I therefore extend my heartfelt gratitude to all the participants and organisers of this conference for their ongoing and future efforts in understanding these phenomena and their economic repercussions. The impressive conference programme bears testament to the dedication of the economic community in comprehending these complex matters and providing enhanced analysis to foster better policies for the overall well-being of our society.

