



BANCA D'ITALIA  
EUROSISTEMA

**29<sup>th</sup> (EC)<sup>2</sup> Conference on  
“Big Data Econometrics with Applications”**

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It is my great pleasure to open this conference and to welcome all the speakers and participants. I thank the organizers for designing such a broad and topical programme.

With the increasing digitalization of the economy, data has become central in all the social sciences, and economics is no exception. In fact, some have talked about data being the new oil of today's world. Econometrics and statistics are therefore becoming increasingly dependent on the availability of huge and heterogeneous datasets.

Only few years ago, the econometric profession was rather cautious about Big Data. Classical econometrics is based on theory and so relies on approaches that differ significantly from those of Big Data analytics. Econometricians have been taught for decades to start with a theory and then use data to prove or disprove it.

Big Data and machine learning work in the opposite way: they allow one to look for patterns simply by processing huge amounts of data, regardless of possible underlying models. It's important to note that most econometricians have expressed concern about the reliability and representativeness of such vast datasets.

However, it's becoming evident that Big Data could disrupt traditional econometrics. Data collection from social media has produced unprecedentedly large and complex, though unstructured, datasets on economic agents' behaviour and interactions, and these are proving to be a goldmine of economic information.

We have been working with data analysis for many years, but it is now time to adapt our computational approaches to the new context.

The Bank of Italy, because of its multiple functions, follows the evolution of Big Data very attentively. We will discuss this topic in a workshop organized with the Bank of International Settlements next 15 January here in Rome.

In the last few years we have progressed along our learning curve. We have combined skills in economics, econometrics, statistics and computer science to deal with the increasing volume, variety and velocity of data, which we have then used to estimate unemployment and inflation, to improve our economic forecasts, and to measure consumer and business sentiment.

We, like all central banks, must also be ready to cope with the increasing public demand for access to granular data. As a data producer, the Bank of Italy has always strived to make its statistics available to the widest possible audience. We already share some data with researchers and other institutions, while protecting confidentiality. We have also started to design a Research Data Centre that will provide a safe haven for processing different kinds of microdata.

The number of possible applications of Big Data for central banks is huge, but some are critical.

The financial services sector handles sensitive information about individuals and firms. More data available in digital format makes life easier for analysts but increases exposure to security breaches.

As more services go online, data ubiquity, and hence data security, are proving to be a major challenge for both private companies and central banks. Financial operators are able to gather massive amounts of data about customers and visitors, which are then analysed to generate insights into buying behaviour. Some of this data is personal, and deserves to be protected against inappropriate use. That is a goal that the whole of society must pursue.

Another important aspect of these innovative technologies is financial stability. New entries have arrived in the landscape of financial services; Fintech is a portmanteau word meaning any application of digital technologies to finance. Under this label we can include both giants of the digital world wanting to enter the financial market and tiny start-ups whose ambition is to erode the market power of the incumbents.

All this is beneficial to competition and productivity in the financial industry, provided that the new entrants are properly supervised. Technology can help to innovate financial products and services currently provided by the traditional industry to the benefit of consumers. However, given all the well-known interconnections

between operators in the market, the repercussions of technological innovation on the system's stability are not clear. Public institutions like central banks and other financial supervisory authorities should examine the matter carefully.

The Bank of Italy has created an internal multidisciplinary team on Big Data, Machine Learning and Artificial Intelligence. The team includes economists, statisticians and computer scientists from different departments, working in close cooperation with the Information Technology Department. IVASS, the insurance supervisory authority working under the umbrella of the Bank of Italy, has opened a regulatory sandbox for some aspects of Fintech/Insurtech.

To conclude, I am confident this conference will be an important occasion to review the most recent findings on Big Data econometrics and its application to national institutions, in particular central banks, and international organizations. Bringing together researchers from central banks and academia, as we do on this occasion, can provide a broad variety of contributions and perspectives. I am sure we will have two productive and interesting days.

