Artificial Intelligence

Artificial Intelligence (AI) is becoming increasingly prevalent in the economy. Over the last twenty years, there has been marked technological progress in computer hardware and software as well as the storage and use of vast amounts of data. This has led to the development of what Alan Turing described in the 1950s as "thinking machines" which can reason as well as human beings. Years following Turing's conceptualization, John McCarthy coined the term "artificial intelligence" which he defined as "getting a computer to do things which, when done by people, are said to involve intelligence." Today, while various definitions of AI exist, they all have one common element, i.e. that AI reflects a machine's ability to respond in a fashion consistent with human reactions. As AI technology advances so also do the number of AI applications. The transportation industry is investing heavily in autonomous vehicles. The financial industry is developing AI applications to conduct trading, insurance adjustments and fraud detection. The IT and service industries are using AI to provide customer support services. The health care industry is using AI to diagnose illness.

Any time new technology emerges, national accountants need to pause. They need to consider if the current macroeconomic accounting standards and classifications are fit for purpose. That is, do the accounting standards properly record and present the activity. Specifically, national accountants need to consider whether the activity and its output fit within the current production and asset boundaries. Second, national accountants need to discern the nature of the product and how it is valued and recorded. Finally, national accountants need to examine whether the current classifications and set of accounts properly present the activity to users.

AI is produced. It comes into existence through "*an activity, carried out under the responsibility, control and management of an institutional unit, that uses inputs of labour, capital, and goods and services to produce outputs of goods and services.*" (SNA 6.2). Most applications of AI point to AI acting as a "store of value for its owners" that is used repeatedly in the process of producing goods and services. Its use reflects that of an asset. It therefore follows that AI is a produced, non-financial asset and that the current SNA production and asset boundaries fully capture (in

concept) this activity[1]. The final question, whether the SNA and other accounting standards properly present this activity and output, is less straightforward to answer.

While there is general agreement that AI falls within the production and asset boundaries of the System of national accounts there are questions as to how it should be classified and presented. Is it software? Is it a machine? Is it data? Or a combination of all three? While artificial intelligence and software are related, there are some important differences. AI algorithms - using sensors, digital data, or remote inputs - combine information from a variety of different sources, analyze the material instantly, and act on the insights derived from those data. AI algorithms often need access to data in real-time and are designed to make decisions in real-time. These are important differences between AI and the SNA's current definition and classification of software. Is AI a machine? It seems that AI goes beyond the ability of traditional machines, which are only capable of making mechanical or predetermined responses and often require a human operator. AI differentiates an autonomous tractor from one operated by a human. Classifying an autonomous tractor alongside a traditional tractor seems limiting and would conceal important elements about the role and nature of AI from users. Is it data? While AI requires data in order to function, data is more an input and therefore it would not be appropriate to classify AI as data. Therefore, classifying AI as either software, a machine or data does not seem to fully capture its nature.

It could be argued that AI is factor of production unique from either capital or labor. On the one hand, it is produced and therefore reflective of capital. On the other hand, it is capable of making decisions and exercising judgement, which is reflective of labor. An argument could be made that AI should be distinguished and uniquely identified within macroeconomic accounting frameworks. Doing so will permit users of national account information to address important questions such as how AI may be displacing labor as an input into production. It is possible that in the not so distant future AI could replace doctors, teachers, customer service providers – even judges!

AI is unique and if the technological progress continues at its current rate, AI could factor prominently in future economic developments. It is recommended that the Digitalization Task Team develops a guidance note on the treatment and classification of Artificial Intelligence in the System of National Accounts. The guidance note should first outline how AI fits within the current conceptual framework and second propose a set of recommendations aimed at how to classify and present Artificial Intelligence in the national accounts.

Questions for the AEG:

---

[1] The question as to whether statistical systems property capture this information in practice should also be examined but is not the focus of this note.

- Do you agree that a guidance note is needed on how to record AI in the SNA?
- What are the main questions that should be addressed in the guidance note, e.g. should the main focus be on how to record the creation of and on how to classify AI, or should the note also focus on the use of AI in production?
- Do you have specific views on the recording of AI?
- Do you know of any work that benefit the drafting of the guidance note?