

Book Review

DATA CAPITAL: HOW DATA IS REINVENTING CAPITAL FOR GLOBALISATION. Chunlei Tang, First edition. Cham, Switzerland: Springer, 2021. ISBN 978-3-030-60191-1. Pp. 391.

This book uses an interdisciplinary perspective based on economics, data science and business to define and develop the concepts of data capital. It systematically presents key ideas of a data economy. In the 21st century, just like money, buildings, factories, machinery, equipment, intellectual property, patents, or the financial assets of a business or an individual, data can also be considered a factor of production and hence can be called data capital. The author explains that human-created data capital will reshape the world economy throughout the next decades. The book elaborates on how data and the knowledge obtained from the data bring intangible wealth to organisations. It describes that the rise of data capital may lead to economic inequality, so new policies have to be introduced by governments to help in sharing the economic development with all sections of the society for inclusive growth. The book also proposes the development of scales for measuring and regulating data capital in the 21st century and its possible impact on future society.

The book begins with a quote from Lord Keynes “The difficulty lies not so much in developing new ideas as in escaping from old ones.” The first chapter is the introduction chapter that reveals how globalisation is the fundamental reality of our current economic system. Information Technology-led globalisation and digitization is creating “disruptive innovations.” The globalisation of the 21st century is different from the globalisation of the 20th century. Now that globalisation is driven by an intangible flow of data with technology, there is greater involvement of emerging economies since it is not restricted to advanced economies. The current globalisation is a more knowledge-intensive data flow as compared to money and the labour-intensive flows of the 20th century. The digital infrastructure has become as equally important as transportation and logistics, and small enterprises and individuals are being able to compete with big multinationals in innovations and wealth creation. Data-based innovation and data entrepreneurship have the potential to dramatically change the

existing landscapes, including the economy itself. Some questions are raised in the chapter, such as do data have different financial implications from factors that increase technological development. The author tries to identify the lessons we learn from the data sciences by setting up a channel to bridge the gap between our intuition and actual data.

The book is divided into four parts and is sub-divided into 13 chapters. The first part of the book titled *Capital: Something to Nothing* includes chapters two and three. In Chapter 2, *Principles of Capital*, the author states that since the early 21st century, the major developed economies have begun to invest more in intangible assets like research and development, software and databases rather than in tangible assets like buildings, machinery and computers. It acknowledges the work done by the French economist Thomas Piketty, in his book *Capital in the Twenty-First Century*, which elucidates that capital has changed radically. Common types of capital are manufactured capital using machinery, natural capital making use of natural resources like water, timber, energy and mineral reserves, human capital, social capital and financial capital. This chapter describes Jonathan Haskel and Stian Westlake's seminal research which focuses on the concept of intangible investment. Haskel and Westlake present five reasons how intangible investments have overtaken tangible investments in the USA and Europe. Firstly, labour-intensive services have become more expensive when compared to manufactured goods, and intangible investments such as design, R&D, and software development need costly labour. Secondly, new technologies are providing more opportunities for businesses to invest in intangibles with the extensive use of Information Technology. Thirdly, the modern structure of the economy affects the relative importance of intangibles. Fourthly, the rigid regulation of product markets and labour markets encourages intangible investment. Finally, intangible investments like the software of YouTube and Facebook are scalable and provide better economies of scale. This part concludes by presenting the meaning and the characteristics of capital based on prior research. It explains capital as future incomes being capitalised and the rate of interest is the bridge between the capital and income. Intangible capital now becomes the major asset of multinational software companies like Microsoft which has only 1 per cent of its market value represented by traditional assets like plants and machinery. The remaining 98 per cent of its market value is comprised of intangible assets.

Chapter 3 is about The Rise of Data Capital, which gives a detailed account of the benefits of data capital. The manufacturing process is now becoming increasingly digital. Data capital refers to the tangible digital resources, the financial capital, and the intangible assets. The author presents a case study of an American commercial real estate company, 'We Work', which rents out its office space to technology and software companies. We Work leases commercial space from individuals and organizations and rents it out to start-up companies. But since We Work has not invested significantly in intangible capital like software and R & D, it can never achieve the economies of scale enjoyed by a technology company that invests in data capital. Another study presented is the case of the stock market. It is observed that the companies are not completely backed by business achievement, and there are two more players in the stock market. First is the information or news, and second are the players, the buyers, sellers, dealers and market makers who trade in the shares. There seems to be a strange and drastic relationship between news and stock prices. The news of an earthquake in Japan triggers an increase of 18 per cent in the share prices in the USA stock market, and the news of the Covid-19 pandemic may lead to a steep decrease in share prices. Thus, it is the data that drives the fluctuations in the share price. Data capital is described as a data asset that is owned and controlled by a specific agent, collected from the agent's past transactions involved in information processes and capable of bringing future economic benefits to the agent. Companies like Google and Amazon are generating data capital by analysing their past transactions to extract future economic benefits.

Data as a Factor of Production is Part II of the book which is divided into three chapters. Chapter 4, The Composition of Data Capital, presents that the data composition can be understood by applying a set theory with sets and subsets. The chapter defines data, atomic data, data items, metadata, dataset, data tools, data resources, data objects, data nature and data experiments. Atomic data is a state of information that cannot be further broken down. A data item is atomic data with specific characteristics at a specific time. A data object is a unique location of a data item in computer memory. The dataset is a collection of data objects. A data tool consists of algorithms and models which process the dataset, and data resources are then created from related datasets based on logic. The author states that the human brain has a powerful complex system that remembers or forgets

memories, and can separate messages into sub-components and make functional interactions between them and the mind. Non-invasive studies of the human brain like electroencephalography (EEG) and magnetic resonance imaging (MRI) hold a great potential to unlock its mystery.

Chapter 5, *Particularities in Data as Capital*, which deals with the intangible capital, has four unusual economic characteristics: scalable, sunken, spill over and synergy. Data capital meets the four criteria, it can be used repeatedly and in multiple places at the same time, it involves irrecoverable costs, it is non-excludable and it can create high synergy. Humans cannot create a substance or material in mother nature, but data is human-made, so there is endless data that can be created. Data is shareable, compared to an apartment or building where sharing data allows separate ownership to each person. Now, with improved technology, double and triple speed computer networks and the Internet, data with value can generate profits. Some data sources are free, but require a high cost for extraction, whereas some other data sources are easy to use but may have ethical consent issues, privacy issues, and conflict of interests. In this chapter the author introduces the concept of Data Sovereign, also referred to as “data residency” and “data localization”. Data Sovereign is proposed by her as a person or entity with the ability to possess and protect the data. The Data Sovereignty concept can provide data rights and provide a feasible solution to resolve cross-border data disputes, thereby leading the data economy to prosperity.

Chapter 6, *The Metamorphoses of Data Capital and their Circuits*, describes how the human economic system is reshaped when a new general-purpose technology appears. The new technology will not completely replace the old system but will create a shift in the economic system. The author provides a case study of Stitch Fix, started by a Harvard graduate Katrina Lake, which provides personalized tailoring to readymade garments. Initially, Stitch Fix captures 85 data points from each of its customers who were willing to provide data such as size, style, price, and fit preferences. This data-driven tailoring service company could in the year 2015 generate \$300 million and in 2018 it generated a sale of \$ 1.2 billion and was listed in NASDAQ. This case study shows that data capital can generate enormous profits and that consumers are willing to share personal data if they feel they are getting value. The video-sharing platform YouTube is another big example of data capital where data productivity is the determining factor. The author poses a hypothetical question of a data owner and producer,

in which the owner has data but does not have the technology to mine data, and the producer does not have data but has the technology to mine data, then who has a better chance to generate profits? The author says that the producer of data has a competitive advantage over the owner of data.

Hopes and Challenges Brought from Data Capital is Part III of the book. This part consists of three chapters. Chapter 7, *Radical Data-rich Markets*, compares data-rich markets with traditional markets. The author states that markets are the building blocks of the economy. The traditional markets are price-based and fragmented, whereas data-rich markets like financial markets are based on money and they tap into the enormous data to make informed decisions. Chapter 8, *Public Choice on Data Capital*, focuses on the role of governments in monitoring the big multinational companies and the Government as a Data Sovereign. Chapter 9, *Rethinking Economic Indicators with Data-informed Insights*, begins with learning from the 2008 global financial crisis that shook the global economy. The author feels that each economic crisis can stimulate people to rethink and re-examine our view of the world. Data-informed insights along with the right indicators will give deeper insights into the problem.

Part IV of the book, *Regulating Data Capital in the Twenty-First Century*, is divided into three chapters. Chapter 10, *A Global Society with Data Capital*, shows a common thread in economic growth for multiple rounds of globalisation including the commercial, industrial, and information revolution. The role of global flows lies in creating and rebuilding degrees of connectedness among economics both emerging and advanced in which both inflows and outflows matter for growth. Chapter 11, *Worldwide Taxation on Data Capital*, discusses government financing with debt and taxes. The author has successfully pointed out that in the 21st century there is instant global access to information and innovation flows in both directions between advanced and emerging economies, which helps greater participation by emerging economies. The author has reminded us about the dispute on cross-border data flows in which data privacy ethics are too important an issue to be left to data scientists and economists. She has proposed a solution to this problem by defining data rights which deal with the term, and a data capital tax which should encourage data capital accumulation and data production. Chapter 12, *A Blueprint via the Latest Self-governing Openness of Data*, introduces the self-governing openness

of data, where only the data owners should have permission to use the apps.

The author has presented data capital as an amount of wealth that is used in making respective profits to affect the sum of wealth and was successful in figuring out how to derive profits from data. She proved that data profit is achievable through the evaluation of both raw data and its derivative data products or services generated through the processing of raw data. The author has explained beautifully that the most important aspect of the analysis is not what you do with the data, it is what data you use. According to her, more data means less inference and it is the best way to judge whether a method is more applicable or less applicable according to the data, instead of judging the way as good or bad.

George Joseph

georgejoseph@rajagiri.edu