

## BIG DATA'S ECONOMIC IMPACT FOR POLICY MAKING: THE WAY FORWARD?

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**Abstract:** *This article considers big data's impact on business and policy, aiming to understand challenges, opportunities as well as the limitations of the current analysis framework. The study focuses on big data and the analysis of its' usage in the framework of both public policy and private sector. Similarly to other goods with dual usage, big data is considered both as an opportunity and a challenge, due to implied sectors in this respect, i.e., the economic and political ones. The paper searches for consistency in between economics and politics via big data usage and integration, especially as the state-conducted policy making attempts to respond to private sector needs, trying also to mimic the performance management styles. Simultaneously, private companies have to comply with rules and regulations. The conclusions outline the resistance in big data usage within the decision-making process, as result of human willingness or lack of correlations.*

**Keywords:** *Big data, economic policy, management practice.*

**JEL Classification:** *O33.*

### 1. Introduction

Currently, the knowledge-based economy is centered around the usage of big data and there is an entire environment that uses big data and big data analysis for financial and non-financial purposes. Despite the sizeable potential of *Big data*, it needs further conceptualization as well as its usage is not always very clear, especially as it requires more advanced technological usage. First, a survey of the literature review is presented in search of a definition, area of research and future trends. Secondly, a check up on consistency between big data and economics and politics will be done, as opposed to more traditional ways of operating in these industries. In effect, the research question guiding the arguments is: *Is there any connection between greater intensity of Big Data and Big data Analysis into policy correlated with a larger BD&BA decision making based process?*

The importance in answering the research question is to give a hint of academic and professional studies on big data usage and impact on decision makers as well as on certain industries like politics and economics with an impact to society at large. Further on, the article is structured as follows: the literature review will frame the understanding of what big data is, how it can be used, domains of applicability. The next two parts are more specific, the first one addressing big data and economics looking at economic value, economic and managerial performances. The last part will look at big data into economic policy and how big data challenges and changes the way policy is made, how big data feeds-in regulatory requirements, and comparing academic opinions with professional studies. The last section is reserved to the conclusions, as a summarization of arguments in the and answering of the two questions under the considered study.

## 2. Literature review

It is difficult to encompass a comprehensive literature review, in the field of big data, due to the complexity of the domain covering a full range of different subjects: computer science, security, economics, politics, sociology. Of course, they can all be comprised as numbers and used in statistics, yet they disclose a different aspect of usage of big data. Thereby, Günther, et al. (2017) identifies a big data definition put forward by Laney (2001): “Big data can be defined based on large volumes of extensively varied data that are generated, captured, and processed at high velocity.” Another characterization rather than a definition is put forward by Jarmin and O’Hara (2016): “by "big data," we mean data generated as a consequence of government, business, or citizen activities. Big data is often said to be characterized by four Vs: volume, velocity, variety, and veracity. “

The articles identify further social value, economic value and policy value of big data, and also considers the literature review on algorithms, which is generally under looked at especially by social scientists. Despite this perspective, when reduced to its very nature big data is stripped off any direction and is left over with algorithmic intelligence only. Algorithms do not necessarily follow a fix pattern of data structuring as it happens with traditional software but may follow a pre-coded path and construct on in by using machine learning for strategic decision making, to be used by humans which drives them in a direction or another.

In practical terms big data’s data use for instance information collected from traffic cameras in real time monitorization and inform relevant stakeholder in terms of the decision making, or even more sophisticated aspects like AI with noise sensors identifying people carrying guns and shutting them and hence a map of criminality can be developed more accurately (Jarmin and O’Hara, 2016).

Next, this article concentrates only on the economics and policy literature and trying to connect the two to understand if big data economics has any effect on policy and the other way round, as a shift or paradigm, which is wanted in society, as some scholars suggest when they argue that public sectors mimics the private sector already and that we even need a different future of basic sciences like accounting (Haslam, et al., 2017; Haslam et al., 2019).

## 3. Big data and economics

A study by Manyika, et al (2011) estimates the ability of big data economics to generate, on average, revenues of about 3 Tn USD annually, out of which about the half in the USA. Their variables are based on consumers, and in an interesting fashion they monetize on time spent in traffic (jams), better supply and demand matches, life quality, etc. On the other hand, a study that examines the usage of big data for companies, (Brynjolfsson, Hitt and Kim, 2011) discovers a 5-6% growth in return on equity and market value due to big data being put at work. This happens in practice as big data analysis discloses useful statistics, cutting costs, especially for smaller companies that adapt themselves and make use of new types of information in decision making.

Pugna, et al. (2019) links Big Data with performance management from two sides: firstly, how willingly are managers to implement big data in their companies and how willingly are managers to trust big data analysis into influencing their decision-making process, leading to what came to be known as “data-driven decision-making approach – DDD”. Altogether, big data can disclose problems from inside the organization in qualitative and quantitative methods but can show a different view on the markets as well.

A survey done by KPMG on 400 US based CEOs concluded that Big Data and Big Data Analysis (BD&BA) coupled together generally helps in finding new customers,

managing risks, help in designing new products and create new organizational strategies. About half of the CEOs agreed that people are the problem in implementing BD&BA which automatically comes with a risk of disruption and new needed skills for making use of predictive forecasting, enterprise resource planning (ERP) and customer relationship management (CRM). Digitalization in a large sense relates to strengthening a collaborative environment, support technology adaption by the public service and private sectors, building a new set of skills connected to life learning and encourage startups development and contracting brain drain. (Trasca, et al., 2019a). However, most CEOs show low trust in new evidence and even more, they fear a reputational risk. (KMPG, 2016). Independently from this study, McKinsey's research observed little connection between these new types of information and how successful it is (McKinsey, 2018). Generally, BD&BA is perceived to relate to improved economic performance, especially as in the USA companies look rather eager to on big data initiatives and innovations: 'BD applications and analytics are projected to grow from US\$5.3Bn in 2018 to US\$19.4Bn in 2026 worldwide. Businesses using BD will see US\$430 billion in productivity benefits over their competition (not using such data) by 2020' (Pugna, et. al, 2019:4).

In a practical way, as a potential example, big data can be used in creating an EU Insurance Scheme. Alongside with the political will and funds available, the solution is found in big data due to its capacity to identify the right strategy of understanding risks and the balance in between production and the opposite effect of unemployment in the EU institutional architecture. The idea of a unique European unemployment scheme exists since 1975 and it went along with the Single Market, a centralized fiscal EU policy, social mobility policy and a balanced redistribution of wealth inside the European Union, especially in the euro-zone. The methods used up to now were statistical and they manage to prove that the average benefits of such a scheme are lower than the standard deviation. Other scholars suggest that if we compute and add many adjustments and aid funds, while also considering the natural unemployment scheme, such a unemployment benefits scheme will be more advantageous in terms of the production gap for more development and less developed states and aggregated big data may reveal this in the following years, yet more monitoring is needed (Trasca, et al., 2019b).

#### **4. Big data and policy**

As a general feeling, policy makers see more challenges than opportunities in big data usage, though recognizing the added value to public policy. Azzone (2018) sees public policy in connected with public good of individuals and of society, by its capacity of solving problems. As opposed to traditional public service where utilitarianism was used, the good of many is a standardized general form, the novelty with which big data in public services comes is multiple. First, big data comes with "completeness" meaning that all voices are heard into society, and weighted appropriately, not necessarily favoring the 'average user'. Secondly, big data allow precision policy by a better segmentation and individualization of needs for categories and sub-categories, like it happened for instance in Italy with differentiate support for house owners accordingly to different vulnerability risk and possibility of earthquakes in different regions. Out of 18 million buildings in Italy, due to better use of data 550,000 were identified as risky and addressed appropriately by better policy.

BD&BA can be used in identifying and anticipating trends that can be used in socio-economy policing. Timely warnings and weak signals analyzed even from social media or on how micro-companies are adapting to the economic reality in valuable insight in addressing

challenges in a future proof manner. The question is whether the government is a greater user of big data than the private sector and who comes first in a race where players are co-dependent. Public policy should encourage via laws certain practices and cut down on others by exercising its coercive powers with respect to democratic values. The public sector also has the capacity to create best practice in a certain industry as well as create bottom-up self-regulation.

Currently the governmental cloud as a big subject in the EU and big data infrastructures always has been. Big data infrastructure is a burden for electricity consumption, and for data stewardship, involving technical networks, law – like privacy, and certain institutions willingly to access and know more about citizens with suspicious activities, even though are not necessarily intitled to. In this sense, a system of records is necessary to be kept and, in this way, big data can even advance. Honest statistics as Jarmin and O’Hara (2016) argue are unlocking great potential due to safe outputs. Human capital may be more tended to creatively work on data and hide under various methodologies, its accountability being loosen. Big data tools will provide better coordination via linkages, integrated and smart analysis, in a cause -effect way.

OECD (2021) launched a study Artificial Intelligence, Machine Learning and Big Data in Finance. The study is made by a supra-state organization analyzing financial firms and trying to explain them how to become more efficient by presenting a macro picture of the financial environment, yet not forgetting to mention advantages to customers/citizens in the most inclusive way. As governments tend to have a moral approach, OECD rise the issue of pro-cyclicality and system risks in the markets and policy, given the use of AI and big data are at the beginning, have a „dynamic adaptability and a level of autonomy” acting at feeding in policy process and big data, and acting also at micro economic level by providing and analyzing targeted data, optimizing businesses processes, etc.

## 5. Conclusions

Considering a *prosumeristic* approach, BD&BA industry is currently estimated at USD 3Tn annually. It is difficult to separate between a typical productions approach and a consumer’s approach as big data triggers a shift in the economic paradigm as well as the profile of the work force, whether white or blue collar.

Literature review presenting opposing view on BD&BA, which was expected, as some markets are fast adaptors like the US, while other developed or developing markets are more traditional. Surprisingly, even in the US, the problem was not perceived big data or artificial intelligence as such, yet the human factor mastering it.

When we come into the dichotomy of big data’s impact on politics and economy, big data aggregates data and their connections, generating new types of data for human decision-making factor. The OECD’s report title stands as an example of this practice, while OECD is a supra-statal organization, explaining the use of machine learning and artificial intelligence in big data on finance, point a trend, where all data is gathered and combined in new ways for a more intense use. Apart from the human nature factor that is sometimes reluctant to make use of big data as it is rather novel and potentially risky, yet not necessarily unreliable, no other critics were identified to serve the purpose of this article.

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