Data Phenomena, Transparency and Economic Efficiency: the Data Economy

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ABSTRACT
One of the characteristics of economics is the cumulative aspect of it that generates many models and theories applicable in a politico-historical timeline. Nowadays, we are living in an era that is driven by data. Economists are starting to study and treat data in order to establish real economic models involving the data phenomena with the objective to reach economic efficiency in the market. Hence, now is the time to define data economics. In addition, governments are showing their will to gather data and regulate it in order to maximize the welfare of all economic agents.

Authors Keywords
Economics; Data Economics; Transparency; Efficiency; Web; Micro Data Economics; Macro Data Economics

ACM Classification Keywords
E.m Miscellaneous

INTRODUCTION
Economists play a key role in the identification, the analysis and the optimization of resources and wealth of the modern society and in the process of distribution, regulation and control, in order to achieve a social optimum determined by efficiency, named economic efficiency. These economists acknowledged their unique and indispensable role in every domain and industry, and are nowadays gaining more importance in the scientific and technological industries, including the digital industry. The OECD affirms that the Internet made the economic activity more efficient, faster and cheaper – this is due to the increase in social interactions on the Web. Internet provided both consumers and producers more power by creating new opportunities thanks to the access to information [4]. Given this access, a pressure to lower prices has been made which leads to efficiency and to a decrease in overall prices. Amid the digital evolution, models are evolving and even new ones are being shaped, which makes the analysis of the models more complicated, therefore new studies must be conducted.

In fact, interaction and access to information are two factors that trigger efficiency. The expansion of the Internet can help economic development of many countries that benefit of its services. There are new forces with the digital revolution that are being affected by the Internet and muting the processes of the companies and of government.

Since 1990, digitalization has entered all industries at a fast pace and data has been collected, but in a disordered way. The value of the digital market is not only affected by the transactions made in it, but also from its traceability. To treat this data in an efficient way, new methods have emerged like building econometric models based on relevant data that can help in predicting future behavior of the economic agents and in making better decisions for both public and private sectors. Thus, data economics recently emerged to study all data-related topics and issues in a scientific and economic sense.

MACROECONOMICS AND DATA ECONOMICS
One of the main characteristics of data economics is transparency and easy access to information by economic agents [10]. The fact of treating data in

the right means is generating value by taking this analysis into consideration while defining the financial and economic policies of the government [5]. In fact, before the development of data economics, governments were facing a problem concerning the distribution of revenues and allocation of resources because it had no access or efficient way to treating data collected from citizens. Nowadays, data is becoming more available, accessible and treatable by the government. Hence, we can start talking about a government that is informed of the needs of the citizens in an optimal way, which leads to an increase in economic efficiency and resource allocation by applying the most appropriate policies that reflect more and more the exact needs of the citizens. This process – the convergence towards optimality – is evolving and getting better every day in today's 24-hour economy.

In reference to the World Bank [2], e-government is the application of the tools and techniques of e-commerce to the business of government for the benefit of both government and the citizens and businesses that they serve. E-government is hence force the tool to maximize the interaction between the government and the citizens, which enhances significantly public policies and thus reduces – if not, eliminates – the problems of economic efficiency and distribution of revenues that were mentioned in Musgrave's traditional Theory of Public Finance [9]. Given the significant development of information technologies, which leads to greater exposure to data phenomena, e-government is using tools such as the Internet, the World Wide Web and mobile computing to get in touch with citizens and businesses in order to optimize public services to citizens, enhance the interface between businesses and industries, enrich citizens by giving them access to knowledge and information, and optimize the work of the government by making it more efficient and effective.

MICROECONOMICS AND DATA ECONOMICS

One of the major theories explaining the theoretical framework of the competition is the theory of price determination that began in the nineteenth century by the classical economists: Pure and Perfect Competition (PPC). The PPC provides a balance in all markets that are under well-defined conditions [1]. During the first half of the twentieth century, after the resumption of Lionel W. McKenzie's work by Kenneth Arrow and Gerard Debreu, they did many works that formalized the conditions of the economic model of the PPC, which helped them in receiving the Nobel Prize in economics. But, like all other economic theories, it faces many limits, especially when it comes to transparency, which was greatly applicable during that period of time. Nevertheless, due to data economics, access to information has enabled markets to achieve their goal of transparency. This has been reflected by a decrease in prices and a better quality in services offerings. On a separate note, that is due to the ability to personalize the goods and services offered in a market characterized by a furious competition.

Another criticism of the Pure and Perfect Competition theory is the lack of perfect information [3]; one of the greatest market failures is asymmetric information. A divergence exists between access to information of the offer and demand of the market. The two major consequences of this asymmetry are moral hazard and adverse selection. Moral hazard is a behavior of an agent that is defined by an information asymmetry between both parties present in an ecosystem, and this data asymmetry is disclosed only after signing a contract. So, data economics solves this problem and this market deficiency by providing all the parties with a better and complete level of information, which eliminates the cause of the dispersion of information. Consequently, the fact of integrating data economics in every level of the market forces economic agents to become more efficient thus

creates natural auto surveillance phenomena of the market.

On another hand, the game theory is an economic theory that defines strategic decision-making. Specifically, it is the study of mathematical models of conflict and cooperation between the rational and intelligent decision-makers. In fact, perfect information is often confused with complete information, which is a similar concept. Complete information requires each player to know the strategies and payments available to other players, but not necessarily the actions taken. Kuhn and Tucker (1951) [8] outlined that the fundamental problem of the game theory is to find the methods that allow a player to achieve the most adequate and favorable result. If the fundamental problem of the game theory is to find the optimal solution for individualist players, the fundamental problem of the theory of transparency is to find the optimal solution for the overall system. This is when data comes in handy: by analyzing all the data available in the market, individualist players can make better and smarter decisions that can lead to maximum profit for all. Integrating data economics in every system helps achieve efficiency and maximum profits for all players in the market.

REGULATIONS

Public institutions and regulators around the world have been setting up new regulations in order to protect and frame the evolution of the personal data phenomena. On the European level [11], the G29 and the European Data Protection Supervisor (EDPS), as well as several other international organizations including the OECD and the RIPD (Ibero-American Network of Data Protection) are in the process of pushing international governments to cross borders and create a charter stating international legal instruments to regulate the explosion of personal data. Only twenty countries have involved authorities using the decision making process of international conferences to data protection and privacy – starting with Belgium, France, Germany, Switzerland, Italy, United Kingdom, through Lithuania, the Republic check, Greece, the Netherlands, Poland, Ireland, Spain and Portugal, and ending with Argentina, New Zealand and Andorra.

We note that the U.S. case has no clear laws of personal data protection, thus still validating the theory of state policeman, and therefore stimulating the self-regulatory process. Transfer disorders and interconnections on the European/American transmission channel took place, as well as flagrant abuses by US companies from unfair collection of personal data and information using digital sensors. Consumers felt completely transparent, which resulted in the opposite effect for Web consumers.

On the Lebanese scale, until now, a proposal for legislation has been prepared based mainly on the Directive 95/46/CE of the European Parliament and the Council of October 24, 1975 on the protection of individuals with regard to the processing of personal data and on the free movement of such data, and on the Directive 2002/58/CE of the European Parliament and of the Council of July 12, 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications).

ISSUES AND CONCERNS

Transparency cuts both ways. It increases the global value of the economy, but for some in an unbalanced way. Entities that are seeking personal data benefit more than proportionally compared to the consumers that are producing "Freely" this data. Many statistics show that the majority of consumers do not appreciate this fact and consider it as a scandalous violation of their rights.

We propose to launch an economical quantitative and qualitative study, and establish the global value created function that is the aggregation of all the values created for every party in the market. Afterwards, we may find a scientific solution to this dilemma that evolving every day that adds to the opposition to the two parties.

CONCLUSION

Today, we can talk about data economics as a pillar in this social science that is prompting economists around the word to restudy existing models and sometimes to reinvent new ones. The most strategic ally to this new pillar is transparency that is becoming more and more developed thanks to the digital transformations happening in the market. Nonetheless, data economics is and will still be facing many challenges in terms of treatments of data and especially in its regulations. By analyzing thoroughly the market, we found that a new form of monopoly is taking place by taking the form of a legitimate data monopoly – assuming that every player in the market has access to all information; In fact, we are neglecting the source of this information that is owned by the aggregators that are the new forms of governance in a market that surpasses traditional country borders.

Until now, far from being implicated deeply into the studies of the data phenomena, some do not believe in the importance and implications of data economics, and some confuse it with econometrics and statistics. We need somehow to move to an upper, bigger scale, to the big data. Every school of economics must include in its curriculum data economics, for every potential economist must be aware of the value that can be generated from the data and be able to start thinking and adding knowledge into data economics.

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