Business Intelligence for Decision Making in Economics

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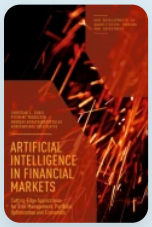

Artificial Intelligence in Financial Markets

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Abstract

The aim of this research is twofold. Firstly, we aim to improve the efficiency of closed funds (a closed fund represents a fund that is developed as a financial product and is multiplied after its conception to a ratio that could reach 250:1. This depends on investor's requirements (i.e. an initial fund that uses 20 million USD for buying its stakes, can be multiplied 250 times and reach a value, when it is sold as a financial derivative, of 5 billion USD [Bodislav, The optimal corporative model for sustainable economic growth for an emergent country 1. Bucharest: ASE Publishing, 2013). These types of financial vehicles are developed and sold by

investment banks such as Goldman Sachs and JP Morgan. The preferred closed funds vehicle for selling to clients is through financial derivatives. According to the International Monetary Fund (IMF) financial derivatives are: 'financial instruments that are linked to a specific financial instrument or indicator or commodity, and through which specific financial risks can be traded in financial markets in their own right. Transactions in financial derivatives should be treated as separate transactions rather than as integral parts of the value of underlying transactions to which they may be linked. The value of a financial derivative derives from the price of an underlying item, such as an asset or index [IMF. International Monetary Fund. Financial Derivatives. http://www.imf.org/external/np/sta/fd/, 2015]) by developing an algorithm which uses data from the US stock market. The secondary output is to use the same algorithm as a model, which is scaled to fit and solve issues regarding automated decision making at the government level. This is similar to a basic Business Intelligence (BI) solution (it follows similar procedures to the workflow of IBM Cognos), which offers a solution in identifying the most suitable path from which governments are able to make decisions. It is particularly important for a country to identify its needs and requirements related to new investments in infrastructure, healthcare and/or education. All the principles developed in this model can be scaled through their results to determine the best solution or best fit when considering global economic output as a forecasted variable.

The model developed in this research is based on companies traded on NASDAQ because they offer transparency, the companies in the sample are deemed reliable as far as reporting. Furthermore, and most importantly, on the whole the companies listed on these exchanges are found to be a true reflection of the economic sectors that form a nationwide economy.

The synergy between Big Data analysis, BI practices and processing power could lead to new businesses designed by investment banks and complex software developers. In the long run the result of their work would be the business of automated decision making used to reduce the paths that could be followed in developing a country or even to make decisions concerning private investment.

The novelty of our sophisticated Business-Automated Data Economy Model (BDM) is mainly due to how our model is applied. This research is the first time Big Data has been analyzed by an integrated model with a focus on automated decision making as a proxy for developing better and smarter investment procedures. The analysis contributes to decision making made by individuals, corporations as well as offering viable solutions for governments. This interdisciplinary research is created as a path to adjust policy making through the use of intelligent systems based on Big Data and BI for creating policy and to select the most suitable path to follow.

Notes

1. A network economy is a new organizational form of economies that is not situated in a hierarchical system but in a horizontal distribution of power and relations. As a result, so there are no clear leaders that impose themselves on smaller economies.

2. Overheating the economy leads to faster pace production. This leads to an increased consumption of resources in order to maintain the production cycle at a microeconomic level. At a macroeconomic level the unemployment rate decreases and the overall standard of the economy improves. Contributing factors may include the overall output of an economy and a reduction in the rate of unemployment to lower than the natural rate of unemployment. As a result, revenues to the government in the form of taxes are increased in a way similar to the evolution of the Okun’s law [18]. Furthermore, if the economic

output is higher than the potential output of the economy then the economy enters a boom cycle and in the long run this increases the chance of a ‘crash’ or a severe adjustment/correction to normal levels.

3. The sample created by Schumpeter was developed by observing the data offered by Western and Central European countries, that is, countries that were economically affected by World War I and II, but were booming in pre-war.

4. China represents a paradigm, because although it represents a producer, consumer, exporter and importer, it has struggled to become a global leader when it comes to Research and Development.

5. The technical framework represents how the economic aggregates function, how they influence global economic growth and their relationship with consumption and investment/savings.

6. Robert Solow’s theory of economic growth includes the idea that growth is accelerated when capital is preponderant in the economy. This is because the scalability of employees is lower and they can more easily be replaced by technologies that evolve exponentially over time. This way the momentum increases exponentially at the macroeconomic level as well. Solow was the pioneer behind the idea of growth through capital accumulation by correlating the savings function with the investment behaviour of individuals. Reference to the GDP formula can be made from equation 5.1 in this chapter.

7. The Global Industry Classification Standard has classified the sectors as follows [30]: energy, materials, industrials, consumer discretionary, consumer staples, health care, financials, information technology, telecommunication services and utilities.

8. NASDAQ OMX is the largest electronic equities exchange in the United States.

The company owns several stock exchange platforms worldwide. NASDAQ OMX Group also offers services that help companies with investor relations, market intelligence, board relationships and news dissemination. All of which create transparency when it comes to investing in the companies listed on NASDAQ [31].

9. We understand national consciousness to be the desire to unify a geo-political territory that has a population that wants to speak the same language and have the same governing laws.

10. The theory of transaction costs underlines the fact that when developing an economic model, a company or a business venture, the development or maintenance of the enterprise will have some operating costs, also known as transaction costs [32]. When it comes to our model we needed those costs to be near zero and the only transparent and open market with near zero costs is the NASDAQ OMX platform.

11. 'Volatile status of a modern economy' as we understand it means the actual development of modern economies, which have as the most important sector the Financial and the Derivatives sectors, because they fuel all other sectors. These two sectors represent the blood stream for all other sectors and they need to be highlighted accordingly.

12. This was the initial path followed when selecting the companies. The fact that these companies are from different sectors and have different markets in which they trade creates diversification. This method of selecting the companies also offers insight into the idea of autonomous systems that are created by using a simple selection process. The idea of simulating an economy offers an optimal path for creating economic growth by emulating real economies.

13. The process of creating the model is transparent, simple, and offers a new

tool to explain financial growth instruments without the need to have components that are tested beforehand for them to be used in the model; it applies to all similar components (replacing companies with others which have the same activity domain and that the replaced financial value in the model is of a comparable value).

14. Zacks Investment offers solutions like Insider Trader and Value Investor to help investors specify their investments based on preferences, individual circumstances and tolerance for risk. This may be for long-term investing, hedging or pure speculation.

15. '*Muddling through*' is a concept used by the Obama Administration in the 2008–2012 mandate for explaining the inefficiency in obtaining sustained economic growth, although economic measures were implemented.

16. Although the acronym is BRIC (Brazil, Russian Federation, India and China), because of the advancement of South Korea it is considered that this country could enter in the select club of powerful emerging economies

17. In calculating the growth of an economy or of one of its sectors there are no theories or mathematical models that underline a certain value above which identifies a booming period, however it is acknowledged that when a certain sector or an entire economy is running at a pace well above the average or a trend for more than one year then it can be considered to be booming.

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