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IMPACT OF DATA ANALYTICS IN FINANCIAL MARKETS

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ABSTRACT Analysing the data in a specific goal oriented manner can yield great insights which be used to ensure smooth running and regulation of the markets while avoiding manipulations which can have adverse impact on other market participants and damage the integrity of financial market framework. Large institutional players often use unethical methods to move the markets in there favour, one of the the example is freak trades. This issue can be countered by making it mandatory for brokers to share live trade data which can be thrown into manipulation detecting models specially for freak trades. Machine Learning and deep learning models can be made for detection of manipulative occurences which includes fake news detection, manipulation of bid ask depth. Data analysis shows immense potential for the process of regulation of financial markets.

KEYWORDS : Data analysis, financial markets, deep learning, Machine learning, manipulation

I. INTRODUCTION

Regulation of financial markets are key for the smooth functioning of the the finance world. Not only it is a matter of protection of market participants but also a sign of pride for a country's financial framework. I introduce to all the readers the way in which freak trade I.e. the trades which are done to manipulate the markets in the favour of the manipulator and at the expense of generally other smaller retail traders. These retail traders tend to get trapped in the manipulation for example if it is done by aggressively pushing the price higher by buying and the retail participants think the price will move even further due to the speed with which it is been pushing. They buy the rally and often than not the price suddenly pulls back heavily triggering all the stop losses of the retail traders. To prevent this here comes the a system, a kind of black box system, which is designed on the basis of data analysis from different sources including the market participant's trade data from broker that too live and the live data from the market itself. Artificial Neural Networks(ANN) can be used for building such black box models where data can be pushed in and the results will be spitted out.

II. CURRENT FINANCIAL MARKETS REGULATION FRAMEWORK

Indian Capital Markets are regulated and monitored by the Ministry of Finance, The Securities and Exchange Board of India and The Reserve Bank of India.

The Ministry of Finance regulates through the Department of Economic Affairs - Capital Markets Division. The division is responsible for formulating the policies related to the orderly growth and development of the securities markets (i.e. share, debt and derivatives) as well as protecting the interest of the investors. In particular, it is responsible for

- institutional reforms in the securities markets,
- building regulatory and market institutions,
- strengthening investor protection mechanism, and
- providing efficient legislative framework for securities markets.

The Division administers legislations and rules made under the

- Depositories Act, 1996,
- Securities Contracts (Regulation) Act, 1956 and
- Securities and Exchange Board of India Act, (1)

A) The Regulators

Securities & Exchange Board of India (SEBI)

The Securities and Exchange Board of India (SEBI) is the regulatory authority established under the SEBI Act 1992 and is the principal regulator for Stock Exchanges in India. SEBI's primary functions include protecting investor interests, promoting and regulating the Indian securities markets. All financial intermediaries permitted by their respective regulators to participate in the Indian securities markets are governed by SEBI regulations, whether domestic or foreign. Foreign Portfolio Investors are required to register with DDPs in order to participate in the Indian securities markets.

Reserve Bank of India (RBI)

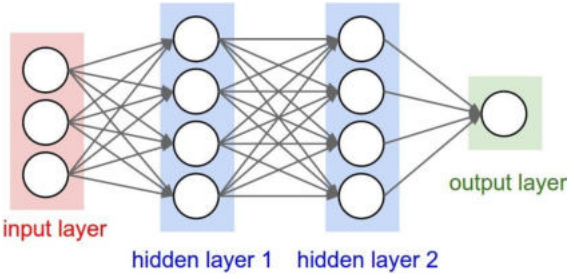
The Reserve Bank of India (RBI) is governed by the Reserve Bank of India Act, 1934. The RBI is responsible for implementing monetary and credit policies, issuing currency notes, being banker to the government, regulator of the banking system, manager of foreign exchange, and regulator of payment & settlement systems while continuously working towards the development of Indian financial markets. The RBI regulates financial markets and systems through different legislations. It regulates the foreign exchange markets through the Foreign Exchange Management Act, 1999.

National Stock Exchange (NSE) – Rules and Regulations

In the role of a securities market participant, NSE is required to set out and implement rules and regulations to govern the securities market. These rules and regulations extend to member registration, securities listing, transaction monitoring, compliance by members to SEBI / RBI regulations, investor protection etc. NSE has a set of Rules and Regulations specifically applicable to each of its trading segments. NSE as an entity regulated by SEBI undergoes regular inspections by them to ensure compliance.(2)

III. APPLICATION OF DEEP LEARNING IN REGULATION

Neural networks reflect the behavior of the human brain, allowing computer programs to recognize patterns and solve common problems in the fields of AI, machine learning, and deep learning. Deep Learning describes the concept in which Artificial Neural networks are deployed in order to get data as input and process it in hidden layers and give output.



The data from broker can be put as input. Hidden layers contains algorithms which will process the data and derive if any anamoly is observed. The orders data from all the accounts can be collected and streamed towards the exchange where the data can be put into the input layer of the neural network. If any anamoly is found the account can be penalised, for which the jurisdiction shall lie with the SEBI.

Processing Raw Text Data of Individual Law: We must represent each individual law in a form suitable for ML algorithms to take as inputs. We first convert the raw text of an individual law in feature representation format. For the current experiment, we convert the text of the financial regulation laws to Word Vectors. We describe the process of converting text into feature vectors below.

Step 1: Data Cleaning - For each law, we first clean the text to remove any words that do not represent core content, including meta information such as dates, public law (P.L.) number and other metadata that may have been added by CQ Almanac.

Step 2: Tokenization - After cleaning the data, we tokenize the text. Tokenization in NLP involves splitting a block of text into a set of

tokens (words). This involves expanding abbreviations (Mr. >Mister), expanding words (I've >I have), splitting punctuation from adjoining words (He said, >He said,) and splitting text using a delimiter such as white space (bill was submitted >[(bill) (was) (submitted)]).

Step 3: Normalization - Once tokenized, we must then normalize the data. The normalization of data involves having consistent tokenization across the same set of words. Step 4: Vocabulary - In order to represent text in the form of feature vectors we must find the total vocabulary of the corpus appended with the additional vocabulary of the language. Step 5: Vector Representation - Once we have defined the vocabulary, we can treat each word as adding one dimension in the feature vector that represents a block of text.(3) These steps can be used for processing data from the brokers and consists of methods used for building algorithms.

IV. CONCLUSION

Hence artificial neural networks can be used for detecting any malpractices done by any market participant by using live data provided from brokers and creating a live streaming pipeline to regulator's where models based on neural networks can be used for detecting malpractices.

REFERENCES

[1] NSE Website
[2] NSE Website
[3] Big Data and the Regulation of Financial Markets