

Cryptocurrency Word-of-Mouth Analysis via Twitter

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Abstract—In this work, we aim to understand whether the sharp variations on exchange rates of alternative coins, aka altcoins, can be foreseeable or not by analyzing the relevant data collected on Twitter. For this reason, first we specified various altcoins which match our requirements to be studied on such as exhibiting sudden bumps or pumps during the time interval we are interested in. Then we categorized the tweets of corresponding altcoins day by day in order to investigate their sentiment scores reflecting positive, negative and neutral speculations. On the other hand, prices of each altcoin provided by on-line cryptocurrency stock markets are obtained on the eve of sudden variations of exchange rates. We then try to reveal the effect of word-of-mouth through performing regression analysis on sentiment scores and market prices.

I. INTRODUCTION

In the conventional finance system, exchange rates of currencies over the world are affected by several parameters such as inflation, interest rates, current-account deficits, public debts, etc. Moreover, only central banks are authorized to print money and release to market which is a centralized system in terms of the worth of a currency. On the other hand, bitcoin proposed as a digital money or payment system and alternative to centralized currencies is very popular in recent times. It is not subordinated to any central bank or stock market, on the contrary, any computer equipped with sufficient hardware to implement bitcoin mining algorithm can produce bitcoin or alternative coins which makes digital money market a decentralized system. Most of the researches ongoing for bitcoin are focused on the underlying reasons of its volatile nature and understanding the sustainability of this popularity. Table I is attached to emphasize the seriousness of the fluctuations on exchange rates of bitcoin from May 2013 to January 2018. In addition to bitcoin as a digital money, alternative coins have emerged with lower prices in market and they whet the appetite of investors especially those dreaming of being bazillionaire. To be so, perhaps one needs to answer the question naturally arises here which is *"What are the factors determining the prices or volatility of cryptomoneys?"* Unfortunately, any response to this question is nothing more than a prediction. This is because the supply and demand equilibrium of digital money differs from the standard economy since supplying Bitcoin is a publicly accessible algorithm and demand can not be related directly to an financial parameter [4]. However, there are studies claiming the technological and economical determinants of cryptocurrencies such as economic fundamentals, market conditions, impact of mining technology and

TABLE I
BITCOIN EXCHANGE RATES

Date	Price of a bitcoin
2013, May	117.0 USD
2013, Dec	1,077.12 USD
2014, Oct	321.40 USD
2015, Feb	218.89 USD
2015, Dec	462.06 USD
2016, Dec	949.30 USD
2017, Jun	2,910.44 USD
2017, Sep	4,527.40 USD
2017, Dec	19,537.70 USD
2018, Jan	10,513.30 USD

difficulty [12]. In this paper, different than studies wherein stock market is predicted via sentiment analysis [2], [16], we present a work questioning the existence of speculation in social media that can affect the prices of cryptocurrencies. Speculation, as a word, is defined as trying to guess the answer of a question without having enough information ¹. Speculations can be considered as secret weapons in finance such that it can even cause a company to be bankrupted. Since there have been a huge demand on digital money as an investment tool, it is important to know the identity of the enemy to take precautions. For this reason, a social media platform, namely Twitter, is used to listen to rumors. Through Twitter, nowadays, we have the ability of monitoring others' lives, notions regarding daily events or opinions concerning political issues, products or even meals in the simplest term. Enormous quantity of data is released by the social sensors or namely users continually. Literature contains many studies related to retrieving data from Twitter and exploiting it to analyze various social disorders such as early detection and analysis of epidemics [17], efficiently responding to a disaster [11], detection of traffic events [6], revealing potential drug effects [7], detecting and predicting dynamic changes of social issues [1], understanding the reaction of companies when a specific event takes place and assessing leadership styles [10], analyzing the relationship between cybersecurity attitude and behavior and the way attitudes shape behavior [5]. The rest of this paper proceeds as follows. We provide some related works in Section 2. Then, in Section 3 we describe the method to select proper alternative coins to be investigated for this study and implementation of sentiment analysis on retrieved

¹<https://dictionary.cambridge.org/tr/szl/ingilizce/speculation>