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**Diploma Thesis Abstract**

**Virtual currencies analysis: Case study of Bitcoin**

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# Virtual currencies analysis: Case study of Bitcoin

## Abstract

This diploma thesis deals with digital currencies. There is described and analysed in details digital currency Bitcoin. Theoretical part explains principles, functions and applicability of virtual currency in comparison with fiat currency. It is focused on special transaction system based on blockchain technology. Next, it is explained the use, legality and regulations. Furthermore, there are described value determinants, utilization, influence and consequences in relation with using virtual currency. The practical part is focused on virtual currency Bitcoin and analysis of its the value fluctuation in time. Analysis is based on regression and autoregression models of time series data consisted of Bitcoin price value explained by selected determinants. There are stated and subsequently verified hypothesis. Analysis is concluded with dynamic prognosis and evaluation of models obtained from calculated results. Discussion and recommendation options are included in final part. The thesis concludes with summary of benefits together with security, risks and threats of virtual currency from both objective and subjective point of view.

**Key Words:** Virtual, Digital, Crypto Currency, Bitcoin, Blockchain, Value, Decentralization, Network, Online Transaction, Anonymity

## Introduction

In recent years there have emerged new methods of non-cash payments particularly in connection with the internet. One of the modern methods represents digital currency. In comparison with fiat currencies these digital ones are still just marginal concept. Nevertheless, the popularity and so interconnected usage of digital currencies have grown up very sharply in recent years. Arrival of cryptocurrencies has brought not just another way of possible payment method but also valuable unique technology of blockchain, that has been already in use by central authorities and banks. I choose in my thesis as a representative of digital currency the strongest and most known digital currency, which was also the first of its kind called Bitcoin.

## **Objectives**

The objective of the thesis is to explain and describe the substance of virtual currencies, reasons of their creation and development in time. Furthermore, to clarify the origin and utilization, describe transactions in contrast with fiat currency transactions under surveillance of banks. Special focus is aimed to the most significant performer of digital currency Bitcoin. The aim is to analyse factors influencing the value of Bitcoin. Furthermore, to describe both benefits and risks of Bitcoin application in practise. It is included detail study of two the most popular digital currencies to explain and compare these different competitive crypto currencies. Last but not least, the thesis is focused on economic impacts along with the likely future development and consequences in banking sector. It is followed by the explanation of contrast between fiat and cryptocurrency characteristics, complemented by explanation the digital currency transaction system. The practical's part aim is to analyse the Bitcoin price depending on selected variable factors. The goal of the thesis is to verify stated hypothesis and to determine the variable factors, that influence Bitcoin the most. The analysis primarily serves to compare inconsistent characteristics, highly volatile trend and secondary to show and clarify risks in case of future investment into these digital currencies. Finally, to evaluate the digital currency as a whole and to show benefits of using digital currency in practise as well as associated risks and threads.

## **Methodology**

Theoretical part is concentrated on the description and explanation of theory, definition of individual terms and characterization of attributes in this issue. Practical part is directed to the analysis of selected cryptocurrency Bitcoin. There are collected time series daily data in time period 2016-2017. It is used in analysis time series data of secondary type from publicly accessible resources in order to obtain primary data. Fundamental analysis compares digital currency transaction system with bank transaction using ratio, difference, frequency, electricity energy consumption and its costing. Regional usage, conditions and legal regulation is depicted by methods of: observation, syntheses, description and explanation.

Technical analysis includes real life investment scenario. Explanation of Bitcoin value determinants is done by regression and autoregression analysis using open source software. It is used econometric, mathematical-statistical methods: mean, median, mode, variance, standard deviation, ordinary least square method, correlation matrix and autoregressive integrated moving average. There are used econometric models and tests in order to prove and

verify hypothesis. As well to reveal mutual dependence of Bitcoin price on variable factors. Results are processed into tables with graphical representation and description of development in time to visualize determinants, progress development and comparison.

## **Findings**

The biggest threat to Bitcoin is its regulation. Acceptance of Bitcoin is very low in comparison with fiat currencies. Places where it is possible to pay in Bitcoin are slowly increasing worldwide. The Czech Republic represents unique example of very rich network of places where it is possible to pay in Bitcoin. The most popular and frequently used digital currencies Ethereum and Bitcoin have closely related price. Mining of these cryptocurrencies consumes enormous amount of electricity. Technical analysis of time series is performed by regression. It must be remarked the nature of analysed data belongs to spurious regression. After adjusting the data analysis is performed firstly by regression model OLSM. It proved the strongest influence on Bitcoin's price has the transaction cost. Coefficient of determination explained the variation of the model from 94.46%. The second calculated model ARIMA proved the null hypothesis, the presence of unit root was verified. Statistical significance testing of ARIMA was confirmed in q term. The analysis has come to the conclusion that the coefficient of moving average is statistically significant and can be used for prognoses. Bitcoin time series data is a case of non-stationary data. The Bitcoin trend is dynamic, highly volatile and difficult to predict in future time.

## **Conclusion**

In 2017 it was the first time for Bitcoin to show the world, how strong it could be and how it can influence the economy. This year 2018 is more stable for the price. Volatility is historically on minimum since its existence. There are created models and prognosis in order to make the reality simpler. My own calculated analysis cannot be considered as investment recommendation, because it contains many "deaf" spots, which are substituted by assumptions. Used ratios, rates do not consider lost coins, so the final amount of good and services paid in Bitcoin is no accurate. Although, the basic idea seems to be brilliant, in my opinion the very first and original intention was not about to help the world economy, but rather to help the originator. It is like a magic at the expense of others. To conclude this thesis, I appreciate Bitcoin for independency and freedom compared to fiat currencies. Last but not least I admire the technology of blockchain which is in my opinion the most precious part of Bitcoin.

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