

SELECTED CRYPTOCURRENCY RETURNS AND CAPITAL GAINS TAX - BASED ON THE EXAMPLE OF COUNTRIES WITH VARYING DEGREES OF LEGAL REGULATIONS CONCERNING CRYPTOCURRENCIES

Agata Gniadkowska-Szymańska* Bojana Olgić Draženović**
Stella Suljic Nikolaj***



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Abstract

The purpose of the article/hypothesis: The purpose of this article is to present the impact of capital gains tax on the returns of the two most popular cryptocurrencies: BITCOIN and Ethereum Classic (ETC).

Methodology: In this study, the rates of return on selected cryptocurrencies were proposed as a variable that may be affected by taxes on capital gains. The article presents a new approach to the analysis of issues related to cryptocurrencies.

Results of the research: The results show that for selected countries (Hungary, Italy, Poland, the USA) there is a correlation between the tax rate on capital gains and the return on ETC. In the case of BITCON, however, there is no such a relationship.

Keywords: taxes, cryptocurrency, regulation, capital gains tax, bitcoin, ETC.

JEL Class: F42, G12, G18.

* PhD, Faculty of Economics and Sociology, University of Lodz, e-mail: agata.gniadkowska@uni.lodz.pl, <https://orcid.org/0000-0002-7321-3360>

** PhD (Associate Professor), Faculty of Economics and Business, University of Rijeka, e-mail: bojana.olgic.drazenovic@efri.hr, <https://orcid.org/0000-0002-5175-7439>

*** PhD (Associate Professor), Faculty of Economics and Business, University of Rijeka, e-mail: stella.suljic.nikolaj@efri.hr, <https://orcid.org/0000-0002-0435-4047>

INTRODUCTION

Cryptocurrencies are one of the fastest growing investment markets in the world and one of the elements of Fintech. The cryptocurrency market has emerged as a potentially important non-traditional financial market that uses blockchain technology to enable the creation of decentralized digital assets. A cryptocurrency (or crypto coin) is a digital asset designed to work as a medium of exchange using cryptography to secure transactions, to control the creation of additional value units and to verify the transfer of assets (Härdle et al., 2020: 69–96). During the period from July 2019 to June 2020, the total global value of cryptocurrencies sent and received on-chain was \$340 billion (Chainalysis, 2020). Cryptocurrencies represented an overall market capitalization of about \$2 trillion in August 2021 with participation from both institutional and retail investors (Ossinger and Hajric, 2021). The study aims to fill a gap in research into the impact of taxes on capital gains on a new cryptocurrency. Countries with a different level of laundering related to cryptocurrency trading were selected for the study (Tu and Meredith, 2015: 271–347). The USA has the most compliant legal regulations regarding cryptocurrency, including the recognition of some cryptocurrency as an official payment agent (Ramasastry, 2014). Italy was influenced by the regulations on cryptocurrencies, but it does not treat them as a means of payment, as is the case in the USA (Vaselli, 2019; Rainero et al., 2019). Poland has legal regulations, but not all aspects related to trading in these currencies are regulated (Bollen, 2013: 38). Moreover, under the Polish law, Bitcoin is also classified as a taxable item when used for trade. For instance, it is an exceptional case in Poland where Bitcoin is used to buy aeroplane tickets from Air Lithuanica, a bid at Ebay auctions, buying food at Bobby Burger restaurant in Warsaw. Therefore, from a legal point of view, such scenarios are classified as ‘barter contracts’. It means that there is an exchange of goods and services with no obligation to pay the price (Dobosz and Niziołek, 2019: 275–286). Thereupon, as the Supreme Court of Poland stated, barter is a cashless transaction which leads to the exchange of goods of exactly the same value and is a compensation trade (Przyluska-Schmitt, 2021: 115–134). The Director of the tax authority of Poland consequently classified the difference between the revenue and the revenue-related costs for taxation (Kowalski, 2015: 139–152). Hungary has the fewest laws governing the trading of cryptocurrencies. In addition to the directives imposed by the European Union, Hungary is constantly working on the creation of a legal framework related to the turnover of this type of virtual money (Sobiecki, 2015: 144–163).

However, all the above-mentioned countries charge capital gains tax, i.e. on gaining profits related to buying and selling financial instruments. During the work of the Economic and Monetary Affairs Committee (ECON) in the European Parliament, an amendment to MiFID II was tabled, introducing recital 5a: “Many

individual investors use virtual currencies as substitutes for other assets or financial instruments. Unlike other financial instruments, virtual currencies are largely unregulated. As a result, markets using virtual currencies are opaque, prone to market abuse and not subject to the core investor protection rules. Therefore, virtual currencies as financial instruments should be regulated" and extension of the catalog of financial instruments by point 1 la) "virtual currencies" should be added (Czarnecki, 2018).

Therefore, in this study, we would like to check whether the amount of taxes on capital gains in selected countries will contribute to the rate of return on investment in selected cryptocurrencies. The two most popular cryptocurrencies were selected for the study: BITCOIN and Ethereum Classic (ETC).

Bitcoin is currently the most well-known and popular cryptocurrency in the world and is perceived by many as a symbol of the entire virtual currency market (Segendorf, 2014: 2–71). Bitcoin was introduced to the market in 2009 by Satoshi Nakamoto (2008), and its construction is based on blockchain technology.

Ether (Ethereum) was created in 2015 and is the parent cryptocurrency of the platform called Ethereum. It allows to carry out transactions between users or applications and pay related fees, resulting from the computing power needed to process them. In addition, Ether is based on the same technology as Bitcoin. The difference between them is that Ether enables the creation of so-called Smart Contracts, i.e. scripts and applications that are saved in the data chain. Also, the difference between these cryptocurrencies is that the supply of Ether is unlimited and mining is much easier than with Bitcoin. Ether is also considered to be designed to high security and transparency standards (Wang et al., 2021: 1–18).

1. CRYPTOMARKET AND THE REGULATORY FRAMEWORK

Regulatory regimes for the crypto-asset market are highly ineffective and fragmented. Approaches around the world vary from nonexistent to countries that have begun to establish regulatory frameworks. Most countries have implemented taxation of investors' gains from cryptocurrencies as with any other asset class. Some initiatives have been taken at the international level to identify issues and harmonise the crypto market infrastructure (Karisma, 2022: 82–111).

One of the main drivers is the prevention of financial crime and money laundering risks. The European supervisory and regulatory framework has been strengthened by the Fifth Anti-Money Laundering Directive (EU, 2018). The transposition of the Directive into national law on January 10, 2020 was a major step forward as it restricts the anonymous use of virtual currencies, improves co-operation and information sharing between financial supervisory authorities and introduces stricter anti-money laundering rules for fiat-to-crypto exchanges and

custody providers (Haffke et al., 2020: 125–138). Nevertheless, Houben and Snyers (2020) note that the framework "already lags behind the current reality in the crypto space and is not fully equipped to combat money laundering and terrorist financing".

A few months later, the U.S. Financial Crime Enforcement Network (FinCEN) proposed that financial institutions report and verify the identity of their customers for transactions involving crypto assets over \$10,000 and keep records of transactions over \$3,000 when a counterparty uses a wallet that is not hosted or otherwise covered (Lyons, 2018).

Other important factors include robust consumer and investor protections, as these are exacerbated by price volatility. While these issues should be the focus of crypto asset regulators, they are in the early stages of development due to a lack of understanding of the market (ESMA, 2019).

A step forward in setting financial stability and security standards for cryptocurrency investors has been made by 22 EU countries, including Italy, Poland and Hungary. They joined the European Blockchain Partnership (EBP) on April 10, 2018, with the main goal of creating a European Blockchain Services Infrastructure (EBSI) (Van Eecke and Haie, 2018: 531).

Tax policy related to crypto-assets is a particularly viable policy area for development. The OECD (2020) provided an overview of the treatment in different countries and analysed income, value-added (VAT) and wealth tax regimes. The report found that only a small number of countries consider cryptocurrencies as a type of currency (foreign or domestic) for tax purposes. This is justified by the main factors of virtual currencies, i.e. decentralisation, lack of backing, price volatility and limited use as a medium of exchange. Similarly, most countries define them as a form of property for income tax purposes (Table 1).

Table 1. Examples of definitions of virtual currencies for tax purposes

Intangible assets other than good will	Financial instrument or asset	Commodity or virtual commodity	Currency	Legal payment method	Not specified
Australia, France, Chile, Czech Republic, Luxembourg, Nigeria, Spain, Sweden Switzerland** and the United Kingdom	Argentina,* Brazil, Croatia, Denmark, Israel, Japan, Slovak Republic and South Africa	Austria, Canada, China and Indonesia	Belgium, Cote d'Ivoire, Italy and Poland	Japan	United States

* Note from Argentina: There is no clear definition. However, for income tax purposes, virtual currencies are mentioned along with some financial instruments or assets.

** Note from Switzerland: With the exception of companies that trade in virtual currencies. Those companies account for virtual currencies under inventories.

Source: OECD (2020: 23)

In the U.S., cryptocurrencies are treated as capital assets and taxed when sold at a profit. The tax rate on capital gains ranges from 0% to 37% for transactions made within a year.

Poland has taken a relatively strict approach to regulating digital assets, which are subject to a capital gains tax and VAT. For private transactions, the income is regulated as income from property rights and the profit is taxed progressively at rates ranging from 18% to 32%.

Hungary has introduced one of the lowest flat tax rates of 15% for cryptocurrencies. The taxation targets transactions between cryptocurrencies and fiat money. Moreover, there is no set maximum amount. The tax can be levied on all income from cryptocurrencies.

Italy has chosen to link the tax treatment of cryptocurrencies to that of foreign currencies. For individual crypto investors, Italy is considered one of the most benevolent European countries, as capital gains are only considered taxable if the total value of crypto assets held by an individual investor has exceeded the threshold of EUR 51,645.69 for at least seven consecutive business days within a calendar year (Lener et al., 2021). Moreover, capital gains are only taxed on transactions between cryptocurrencies and fiat money. Furthermore, the purchase and sale of cryptoassets is generally exempt from VAT.

2. DATA, METHODOLOGY AND TESTABLE HYPOTHESES

The main aim of that research is to find the relationship between taxes and rate of return of cryptocurrencies in the period 2016–2020. The study was conducted on monthly data for the period from 31.07.2016 to 31.12.2020. All data relating to the economy and financial market comes from the World Bank database and OECD database. Quotes and rates of return of selected cryptocurrencies came directly from cryptocurrency exchanges.

The following hypothesis has been formulated: the capital gains tax paid by investors is expected to influence the rate of return on selected cryptocurrencies.

The following equation was used to test the hypothesis concerning the impact of the amount of taxes on capital gains on the obtained rate of return on selected cryptocurrencies:

$$R_t = \alpha_0 + \alpha_1 Tax_{ti} + \alpha_2 GDP_{ti} + \alpha_3 CPI_{ti} + \alpha_4 I_t + \alpha_5 U_t + \alpha_6 PL_t + \alpha_7 H_t \varepsilon_t \quad (1)$$

where:

R_t – rate of return on the selected cryptocurrency (BITCOIN or Ethereum Classic (ETC));

Tax_{ti} - the amount of capital gains tax in the country and in time t ;

GDP_{ti} - GDP growth rate in the country and in time t ;

CPI_{ti} - inflation in the country and in time t ;

I_t - dummy variable equal to 1 if t is Italy and 0 otherwise;

U_t - dummy variable equal to 1 if t is USA and 0 otherwise;

PL_t - dummy variable equal to 1 if t is Poland and 0 otherwise;

H_t - dummy variable equal to 1 if t is Hungary and 0 otherwise.

The use of OLS in testing the above-mentioned relationships should be consistent with the assumptions of constant variance and no serial correlation between error terms. Thus, tests should be performed to control for homoskedasticity, which states that all error terms have the same variance, and for any form of autocorrelation between error terms (Wooldridge, 2005: 385–390; Verbeek, 2012). Accordingly, Durbin Watson and White's tests are conducted to test for any violation of the above stated assumptions. The independent variables were not colinear because most VIF values were <5 .

The cross-time regressions were performed by estimating the models for the naive analysis related to the total regression and the fixed effects. Tests for the presence of fixed effects were also carried out (Redundant Fixed Effects - Wald Test).

The description of the test results interpretation is as follows:

Test for the occurrence of permanent effects (Wald test), hypothesis H_0 - no occurrence of permanent effects:

- if the p-value of Wald's test < 0.05 , reject the hypothesis that there are no fixed effects, so there are fixed effects in the model;
- if the p-value of Wald's test > 0.05 , the hypothesis about no fixed effects cannot be rejected.

3. RESULTS AND ANALYSIS

Results of the analysis are presented below. First of all, the summary statistics of the sample taken into consideration is presented in Table 2.

Table 2. Summary statistics of the variables

	Mean	Median	S.D.	Minimum	Max
rate of return Bitcone	0,1051	-0,0009	0,4982	-0,566	1,6207
rate of return ETC	0,1016	0,0612	0,2508	-0,3725	0,7038
TAX	2,0212	1,8935	0,9531	0,9390	4,3110
GPD	1,3453	2,1765	3,8237	-8,9386	5,3594
CPI	1,8140	1,9000	1,1622	-0,9000	4,7000

Source: own elaboration

First, it was examined whether there is a relationship between taxes on capital gains paid by investors and the rate of return on selected cryptocurrencies in the OLS regression model with heteroscedastic correction. The results of these calculations are presented in Table 3. Second, the results of OLS regression with fixed effect estimation for the capital gains tax paid by investors that may influence the rate of return on selected cryptocurrencies are presented in Table 4. The model as presented in equation (1) was tested in the first place.

Table 3. Presentation of OLS regression results estimated for the whole period from 2016 to 2020 for all countries

Rate of return ETC	Rate of return Bitcone	Sample
216	216	const
-0,3582 ** (t = -2,053)	-0,2117 (t = -0,6319)	TAX
0,1625 *** (t = 3,108)	0,0738 (t = 0,5855)	GDP
-0,0110 ** (t = -2,053)	0,0017 (t = 0,1792)	CPI
0,0238 * (t = 1,785)	0,0565 * (t = 1,836)	Italy
0,0259 (t = 0,2573)	0,1049 (t = 0,8589)	Poland
0,2157 * (t = 1,688)	0,0768 (t = 0,4016)	USA
-0,0919 (t = -0,8826)	-0,0834 (t = -0,5992)	Hungary
0,2614 * (t = 1,902)	0,0856 (t = 0,3941)	R ² %
0,0709	0,0222	Adj. R ² %
0,0396	0,0106	F-stat.
2,2685	0,6755	

Note: ***, ** and * denote statistical significance at 1%, 5%, and 10%, respectively.

Source: own elaboration

Table 4. Presentation of OLS regression results with fixed effect estimated for the whole period from 2016 to 2020 for all countries

Rate of return ETC	Rate of return Bitcone	Sample
216	216	const
-0,4499 * (t = -1,957)	-0,7898 * (t = -7,279)	TAX
0,2050 *** (t = 4,303)	0,3347 (t = 4,488)	GDP
-0,009 *** (t = -31,74)	-0,0009 (t = -0,3119)	CPI
-0,0006 (t = -0,3944)	0,0575 (t = 2,240)	Italy
0,2798 (t = 1,004)	0,3439 * (t = 9,730)	Poland
0,0526 *** (t = 5,559)	0,0023 (t = 0,0488)	USA
0,1386 (t = 0,5846)	0,0208 (t = 2,978)	Hungary
0,1263 *** (t = 13,74)	0,0894 ** (t = 23,17)	F-stat.
<0,001	<0,001	

Note: ***, ** and * denote statistical significance at 1%, 5%, and 10%, respectively.

Source: own elaboration

The obtained results, in the case of both estimates, show no relation between the tax rate on capital gains and the rate of return on Bitcoin. This results in the rejection of the previously formulated hypotheses that there is a relationship between taxes on capital gains paid by investing and the rate of return on this currency. In the case of Bitcoin, also any convertible control (GDP, CPI) does not affect the rate of return obtained from this currency. It can be assumed that the rate of return set by investors on the investment in Bitcoin is the result only of the game of demand and supply on the cryptocurrency market, which is in line with the research presented by Härdle et al. (2020: 69–96).

However, in the case of the Ethereum Classic cryptocurrency, both models show a positive relationship between the tax rate on capital gains and the rate of return. This shows that the higher the cryptocurrency taxes, the higher the expected rate of return for investors from the Ethereum Classic cryptocurrency should be. The results obtained for the Ethereum Classic cryptocurrency allow to confirm the hypothesis put forward in this paper that there is a relationship between taxes on capital gains paid by investing and the rate of return on this currency. In addition, in the case of the Ethereum Classic cryptocurrency also the GDP control variable has an impact on the rate of return obtained from this cryptocurrency, but this relation is negative.

CONCLUSIONS

Nowadays, it is increasingly common for people to invest in the crypto-asset market, as they wish to invest their cash and at the same time, to get as rich as possible. Investors are tempted by new opportunities, prospects and profits that can be obtained from a market that has not yet become a common place for the average person to invest. The undeniable advantages of this market include, among others, risk management, avoiding various restrictions in the flow of capital, or creating new and alternative investment strategies. It offers a lot of new opportunities, especially for those who have already tried various forms of investment and are looking for new alternatives (Giudici et al., 2020: 1–18).

The results show that for selected countries (Hungary, Italy, Poland, USA) there is a correlation between the tax rate on capital gains and the return on the Ethereum Classic. In the case of BITCOIN, however, there is no such a relationship.

Digital currencies are an essential part of the investment world and their importance will grow every year. It is impossible to say unequivocally whether cryptocurrencies are good or bad (Włosik, 2021). Like other investments, they have their advantages or disadvantages, but looking at the trends in the society, people will not stop investing in them. Quite contrary, the opposite tendency is likely to be observed. This is, of course, a very risky investment, but it fits

perfectly in today's times. Well-off people like risk, and they certainly won't give it up that easily (Papadimitriou et al., 2020: 112831).

Further research may be related to an analysis divided into sub-periods related to COVID-19 pandemic. The study will also cover other countries whose legal and tax regulations regarding tax cryptocurrencies differ from those currently analysed and presented (e.g., China or the Great Britain).

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STOPY ZWROTU Z WYBRANYCH KRYPTOWALUT A PODATEK OD ZYSKÓW KAPITAŁOWYCH NA PRZYKŁADZIE KRAJÓW O RÓŻNYM STOPNIU UREGULOWAŃ PRAWNYCH DOTYCZĄCYCH KRYPTOWALUT

Streszczenie

Cel artykułu/hipoteza: Celem niniejszego artykułu jest przedstawienie wpływu podatku od zysków kapitałowych na zwroty dwóch najpopularniejszych kryptowalut: BITCOIN i Ethereum Classic (ETC).

Metodyka: W niniejszym opracowaniu stopy zwrotu z wybranych kryptowalut zostały zaproponowane jako zmienna, na którą mogą wpływać podatki od zysków kapitałowych. Artykuł przedstawia nowe podejście do analizy zagadnień związanych z kryptowalutami.

Wyniki/Rezultaty badania: Wyniki pokazują, że dla wybranych krajów (Węgry, Włochy, Polska, USA) istnieje korelacja między stawką podatku od zysków kapitałowych a zwrotem z ETC. W przypadku BITCON-u jednak takiej relacji nie ma.

Słowa kluczowe: kryptowaluty, regulacje prawne dotyczące kryptowalut, podatek od zysków kapitałowych, BITCON, ETC.

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