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INTRODUCTION TO THE JOURNAL ISSUE

This issue of our Journal focuses on taxes that affect companies and decisions of individual market participants. The presented papers cover several important topics such as costs, earnings taxation, and their influence on management in companies, capital gains tax influencing rates of return and market volume of trading, and finally, tax evasion in the light of gender. Moreover, the cryptocurrencies are discussed in the light of money laundering, financing terrorism and tax evasion, which overshadows great opportunities and potential of this new technology. Therefore, the major economies in the world have been working on effective strategies to control and tax the cryptocurrency market.

The paper entitled *Corporate Income Tax Changes in the Context of Earnings Management: a Review of the Literature* aims to provide a comprehensive review of the theoretical and empirical literature regarding tax-induced earnings management. The probability of tax-induced earnings management is higher in the case of extreme changes in the tax rate, larger prospects for tax savings as well as in the case of private firms. This paper identifies several inconsistencies and gaps in the current literature, emphasizing that the connection between firms' characteristics, the level of book-tax conformity and the practice of earnings management remains unclear.

In another paper titled *Costs and Taxes in the Light of Financial Management in Companies Listed on WSE*, the authors present costs, taxes and financial management issues in companies listed on the Warsaw Stock Exchange. They discuss costs and taxes as a part of financial management process and assume that costs influence income taxes in a negative way, and as a result, both liquidity and debt levels are influenced. The attitude toward tax evasion can influence the financial strategies in companies.

In the paper entitled *Factors Influencing Tax Evasion from a Global Perspective in the Light of Gender*, the authors analyze tax evasion and factors influencing tax non-compliance such as gender, age, income, education, confidence in government, political scale, and religiosity. Based on the results, we can conclude that all factors influence respondents in the same way, without distinguishing between males and females.

In another paper titled *Cryptocurrency Market and Tax Regulation in Turkey: the Analysis in an European Emerging Economy*, the authors provide a thor-

ough review of the current state of cryptocurrency market and describe how governments perceive and deal with the threats and opportunities brought by the block chain technology. In this study, the authors analyze the current state of Turkey regarding cryptocurrency taxation, and they propose a tax system. The study is based on a detailed literature review on the subject, including legal acts of the USA, Europe, and Turkey. Cryptocurrency market has a great potential and blockchain technology is full of opportunities. However, it is essential to control this market without harming the appeal of cryptocurrencies, and this is definitely not an easy task.

In the paper entitled *Selected Cryptocurrency Returns and Capital Gains Tax – Based on the Example of Countries with Varying Degrees of Legal Regulations Concerning Cryptocurrencies*, the authors present the impact of capital gains tax on the returns of the two most popular cryptocurrencies: Bitcoin and Ethereum Classic (ETC). 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 Bitcoin, however, there is no such a relationship.

In another paper titled *Trading Volume and Capital Gains Tax - Evidence from Selected Stock Markets with Different Characteristics*, the authors investigate a relationship between capital gains tax paid by investors and the liquidity of the market, expressed by the trading volume. The authors found that in European countries representing stock markets after the systemic transformation, the higher the taxes on capital gains, the higher the turnover on these markets is reported.

The presented original findings are based on diverse markets and may be inspiring for the future research of the Journal of Finance and Financial Law readers.

Issue Editor

Monika Bolek

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FACTORS INFLUENCING TAX EVASION FROM A GLOBAL PERSPECTIVE IN THE LIGHT OF GENDER

Robert W. McGee[*] Jovan Shopovski[**] Monika Bolek[***]

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FACTORS INFLUENCING TAX EVASION FROM A GLOBAL PERSPECTIVE IN THE LIGHT OF GENDER

Abstract

The purpose of the article/hypothesis: The goal of this paper is to analyze tax evasion with special emphasis on gender. Factors influencing tax noncompliance such as age, income, education, confidence in government, political scale and religiosity are analyzed.

Methodology: Tax evasion is analyzed based on the most recent (Wave 7) World Value Survey data with the significance of differences between respondents, correlation and regression models analysis.

Results of the research: It has been found that there are significant differences between the global approach and groups of males and females when the acceptance of cheating on taxes is taken into consideration. The analysis of groups reflected the fact that all factors influence respondents in the same way without distinguishing between males and females.

Keywords: tax evasion, factors, gender, global perspective.

JEL Class: H26.

[*] Prof., PhD, Fayetteville State University, e-mail: rmcgee3@uncfsu.edu, https://orcid.org/0000-0001-6355-288X
[**] PhD, European Scientific Institute, ESI, e-mail: jovanpraven@yahoo.com, https://orcid.org/0000-0002-3240-0901
[***] Prof., PhD, Faculty of Economics and Sociology, University of Lodz, e-mail: monika.bolek@uni.lodz.pl, https://orcid.org/0000-0001-9376-1105

INTRODUCTION

The problem of reluctance to pay taxes may be local in nature and related to one specific country, its policies and the system in force. On the other hand, it can also be universal, related to rationality and behavior of taxpayers. In this paper, the global perspective of tax evasion is presented in the light of factors influencing it with a special emphasis on gender.

Tax avoidance as a scientific issue can be found in at least three disciplines: law, economics and sociological sciences. In each of these disciplines, different issues are considered. In the legal sciences, researchers are dealing with the issue of a complex system of regulations. In economics, the emphasis is put on rationality, and in the sociological sciences, the human aspect is important. This article will explore the factors that may encourage tax evasion without taking into account the division for countries. It will be considered as a human approach to the obligation by which social structures such as education, defense or communication can work.

There are many forms of tax avoidance, and people may choose different methods, depending on the system in place. In general, tax evasion may take several forms and they include: no submission, understatement of income, overstatement of deductions and failure to pay taxes by the due date.

The goal of this paper is to explain the issue of tax evasion by analyzing the social and economic factors affecting it in light of gender from a global perspective. It will examine the factors affecting tax evasion to a greater or lesser degree and will test whether there are different factors that affect male and female compliance. The tested hypothesis is as follows: there are no differences between males and females regarding the tax evasion but social factors influence this phenomenon in a global perspective.

This article first describes the systems and history of taxes from a global perspective, then it presents a literature review, data and research methods, research results and a summary with an analysis of the results obtained.

1. TAXES, HISTORY AND SYSTEMS

According to Adam Smith, social rules were aimed at eliminating the fiscal burden and ensuring the greatest possible degree of fairness and social acceptance of taxes (Smith, 1776). Adam Smith, as the founder of classical political economy, was not an advocate of taxes. He postulated to limit the activity of the state in the sphere of taxation related to internal defense, protection of property and justice within the country, organization of public works and education with the following tax principles: taxes should be fair, certain, convenient and low. Adam Smith's

invisible hand operates on a global scale (Greenspan, 2008). J.S. Mill claimed that as much income as possible should remain after taxation, which is why he was not a supporter of tax progression (Mill, 1884).

Keynes, a proponent of interventionism, supported an increase in the role of the state in the economy, and the reduction of income inequality, i.e. the welfare state. Taxes were related mainly to increasing demand, which was the focus of his theory of growth (Keynes, 1936). Milton Friedman argued that the most important component of economic life is the freedom of individuals to make decisions that have a direct impact on the situation in which they find themselves. Income taxes, if they should exist, cannot redistribute wealth. Taxes should not interfere with economic development and the accumulation of capital necessary to invest and create new jobs. Excessive taxes cause government to grow, have a negative impact on the market economy and thus cause the destruction of society (Friedman, 1963).

Piketty is one of the modern representatives of interventionism who wants to slap wealth taxes of 90 per cent on any assets over $1 billion. Such a policy would severely limit incentives, and thus economic growth (Piketty, 2018).

Perceived justice is an issue that influences an individual's decision to evade taxes. We can distinguish between horizontal and vertical approaches to the system of just taxation. The first one is to impose the same burden on entities that are in the same situation. Vertical justice, on the other hand, means treating subjects differently in different situations. Supporters of the minimalist state and fundamental personal rights will emphasize horizontal justice (Hall and Rabushka, 1985) and supporters of the welfare state the vertical one (Mariański, 2018: 9–26). The systems and history play an important role in tax evasion (Van Brederode, 2020; Frecknall-Hughes, 2020; Green, 2020; Peters, 2020).

There are at least three reasons why higher taxation of rich people is acceptable to some people. First, it is simply fair to tax richer people more, according to the theory of diminishing marginal utility of income. Second, not all have equal opportunities. Therefore, people with lower incomes willingly accept the thesis that richer people did not achieve such success because of honest work, ability or simply luck. The third reason is related to the situation when the inequalities are so great that they threaten the political system because of the perception that it is controlled by the richest elite. As the degree of social inequality increases, so does support for tax progression and its redistributive function. It is also pointed out in the debate on income taxes that without them, the result would be an unfair distribution of the tax burden. However, determining the fair contribution of each citizen has been the subject of many discussions and analyses (Maslove, 1993; Thorndike and Ventry, 2002).

There are a number of flaws in the diminishing marginal utility theory as applied to taxation. Blum and Kalven (1953) were among the first to challenge its

application to taxation. Rothbard (2009) and Lawsky (2011: 904–952) challenged it more recently. The main flaws in this application of the theory of diminishing marginal utility theory are that it is impossible to measure the decline, and all marginal utilities are personal. Such utilities and declines in utilities cannot be compared between individuals. Thus, one cannot state categorically that a rich person derives less pleasure from spending one currency unit than does a poor man. It is merely assumed.

The "fair share" argument also contains some unsurmountable structural flaws. Basically, there is no way for scholars to agree on what "fair share" is (McGee 1999: 318–328, 2004, 2008, 2012). There are basically just two ways to structure a tax system. Individuals should either be assessed to tax based on the ability to pay or based on the cost-benefit principle. The ability to pay approach is a more popular one, yet, it stands on shaky moral grounds because it forces some individuals to pay for other people's benefits (Jouvenel, 1952; McGee, 1998: 503–511, 2004; Nozick, 1974). The cost-benefit approach also has some flaws, since some individuals receive more in benefits than they pay, while others receive less. Some individuals are forced to pay far more than their fair share, which is also seen as unjust. Ethically, it is seen as exploitative. If one begins with the premise that the private sector can make more efficient use of assets than can the government sector, the ability to pay principle also fails the utilitarian ethics test, since it causes resources to shift to less efficient uses, thus reducing total benefits to society (McGee, 2012, 2021).

Taxes are divided into direct taxes — imposed on the income or assets of the taxpayer, e.g., income tax, land tax, inheritance tax and indirect taxes — imposed on the object of consumption, e.g., VAT — ultimately paid by the consumer. OECD (2020) tax classification provides the following distinction of different taxes: income taxes, personal income tax (PIT), corporate income tax (CIT), compulsory social security contributions, property taxes, agricultural (land) tax, forest tax, inheritance and donation tax, taxes on goods and services, value added tax (VAT), excise duty, customs, tax on dog ownership, tax on means of transport, tax on civil law transactions, gaming tax and cedular tax. Having to pay so many different taxes, it is not surprising that taxpayers may try to avoid paying some of them.

Taxes perform functions which, on the one hand, are objective and on the other hand, may change and be subjective based on demand and the wishes of those in charge of the political entity. Taxes cover major public expenditures. The basic functions of taxation in most societies are as follows: fiscal, redistributive, stimulative and informative. The fiscal function of taxes is related to the budget revenue and is one of the oldest tax functions. The redistributive function, on the other hand, is related to the reduction of social inequalities. The extent of tax redistribution depends on the tax system and the degree of progressivity. Whether

redistribution should be a goal of a tax system has been debated in the literature (Blum and Kalven, 1953; Jouvenel, 1952; McGee, 1998, 2004, 2012), but this paper will not go into a discussion of this issue here. The stimulus function may be viewed in at least two different ways. It may be used to alter behavior, by either subsidizing or penalizing certain activities. This approach may target a certain industry, such as oil (stimulate), tobacco (penalize) or alcohol (penalize). In some cases, the tax system may be used both to subsidize and penalize the same industry. The oil industry is a case in point. Governments may give the oil industry tax benefits in order to stimulate production, while slapping a heavy tax on the consumption of gasoline.

The other kind of stimulus aims at stimulating the entire economy, or major portions of it (Keynes, 1936). This use of the tax function has been criticized on both moral and efficiency grounds, but a full discussion of this point is beyond the scope of the present paper (Hazlitt, 1959, 1995; Rueff, 1995; Williams, 1995).

The last of the functions of taxes is the information function. It consists in the fact that the implementation of tax revenues in total or from a specific tax provides information on the correctness or irregularities of the course of economic processes. A significant reduction in revenues from economic entities may indicate, for example, difficulties with selling the production or with the collection of receivables from certain contractors.

In ancient times, only some groups of the population were charged with taxes and tributes. The tax system in ancient Egypt consisted in taking part of the harvest from farmers, while artisans gave some of their products to the army and administration (they sold the rest), and merchants paid tributes. In ancient Rome, cash benefits were introduced alongside the spoils of war and tributes. As a result of wars and rich gains, from 167 BCE the tax on Roman citizens was abolished. In the Middle Ages, taxes were of little importance because the ruler's income came mostly from landed estates, royal privileges and customs. In the 15th century, the tax system developed in France and England. The income tax was introduced in Great Britain as early as the 18th century and in Prussia in 1891. In the 19th century, the tax burden increased significantly and taxes became an instrument of financial policy. In the early Middle Ages, under the conditions of natural economy and the binding princely law, most benefits took the form of tributes. Taxes existed only in territories with a functioning commodity-money economy. In the 13th century — under the influence of the rapid growth of great land ownership, the reception of German law and the accompanying dissemination of immunity, and the expansion of the commodity-money economy — the system of levies disintegrated. The principle of proportional division of income among individual links of the monarchy’s apparatus disappeared and as a result of the loss of full authority over subjects in church and private property from the end of the 13th century, the state's finances were significantly limited. When asked about

taxes and their avoidance, they generally responded in the context of taxing income with personal tax (Mariański, 2018).

Taxes also fulfill a redistributive function, contributing to increasing what some people refer to as social justice. However, they can be a tool to achieve political goals, which in turn may affect the issue of tax fraud by citizens. Until the 18th century, property taxes dominated, mainly on real estate (Sheffrin, 2013). The income tax first appeared in England in 1799. It was initially paid on income above the tax-free amount, which was three times the average annual income, and the maximum rate was 10%. Together with the growing income taxes, the tasks of the state were expanded and thus the need to obtain funds for their financing constantly increased. In other European countries, the income tax was introduced much later. Residual regulations appeared in Denmark in 1870 and in Prussia in 1891. In other countries, its imposition was also related to the ongoing wars, for example, in France, the Netherlands (1914), Belgium (1919) and Poland (1920–1939, 1989). In the United States, the income tax was introduced in 1861 in connection with the civil war and the rates were progressive. It was liquidated in 1872 and introduced in 1894, yet it was found by the Supreme Court to be contrary to the Constitution a year later. It was only after ratifying the 16th Amendment to the Constitution that it was definitively established in 1913, but it covered only a few percent of the population (Mariański, 2018).

2. LITERATURE

According to Richardson (2006), who surveyed data from 45 countries, non-economic determinants have the strongest impact on tax evasion. Complexity is the most important determinant of tax evasion, followed by education, income source, fairness and tax morale. The level of complexity and the higher the level of general education, services income source, fairness and tax morale, the lower is the level of tax evasion across countries. Kurauone et al. (2021: 698–729) found that CPI and trade tax revenue activities are statistically insignificant to tax evasion. Olexova and Cervena (2019: 367–369) postulated introduction of a global tax system that could reduce inequalities in the distribution of global wealth and eliminate or reduce tax evasion. It is believed by many that taking a global approach to cheating on taxes can support the integration of markets. There are several ways to subdivide analysis of tax evasion. One of the common demographic variables used by scholars is gender.

Gerxhani (2007: 503–511) investigated the explanatory power of the new institutional theory in explaining differences in men's and women's tax behavior. Related to tax evasion in transition countries, when formal and informal

institutions are in conflict, more tax evasion is observed. Women are less likely to commit almost all kinds of criminal offenses and are less likely to be involved in and approve of corruption, tax evasion, and other illicit activities.

The literature offers two major theories to explain the gender differences (Gottfredson and Hirschi, 1990; Zager, 1994: 71–80). One theory attributes a gender difference to fundamental differences at the cognitive, emotional and behavioral levels due to biological, psychological and experiential realities. The second theory attributes gender differences to the different involvement of men and women in the workforce and in governments. Women are less corrupt because they are less likely to occupy positions of power and therefore, they have less opportunity to become corrupt. Based on the data from the World Values Survey (WVS) and the European Values Survey (EVS), it was found that women are less likely to approve of corruption and tax evasion, and are characterized by greater tax compliance (Swamy et al., 2001: 25–55; Torgler, 2002; Torgler and Schneider, 2007: 443–470; Torgler and Valev, 2010: 554–568; Alm, Jackson, and McKee 2006: 06–44; Baldry, 1987: 357–383; Torgler and Schaltegger, 2005: 403–431; McGee 2012; Pardisi and McGee, 2022; McGee, Shopovski and Bolek, 2023).

Other studies stressed the relative importance of education, income, age, and number of children, among other factors influencing tax evasion differences between men and women (Ross and McGee, 2011, 2012; McGee & Shopovski, 2022). The feminist theory and to what extent these can be integrated into the new institutional theoretical framework should be also considered here (Gerxhani, 2007: 503–511). With the rise of women's studies, gender differences are the result of social and cultural influences, such as the level of education, work experience, discrimination, and the organization of the welfare state (Kuiper et al., 1995; Blau, Ferber and Winkler, 2002). It has to be added that the one-sided focus on social and economic forces was criticized, (Hewitson, 2001). Gender differences are now generally perceived as resulting from both biological and cultural influences.

The results related to tax evasion and gender hold for both advanced Western societies (Giese and Hoffman, 2000; Torgler, 2002; Flathmann and Sheffrin, 2003; McGee, 2012; Pardisi and McGee, 2022) and Central and Eastern European societies (Gerxhani, 2007; Hanousek and Palda, 2002: 85; Gerxhani and Schram 2006: 402–422; McGee, 2012; Pardisi and McGee, 2022). According to Molero and Pujol (2012: 151–162): “This differential behavior is attributed normally to structural differences in tax morale, even if it is difficult to find sociological or psychological intuitions justifying such gender differences”.

In the paper by Kasipillai and Jabbar (2006: 73–88) it was found that males and females had a similar compliant attitude. Three independent variables, namely gender, academic qualification and a tax preparer status were found to be significant in determining the attitude towards non-compliance. It is generally accepted that tax non-compliance exists everywhere (Kasipillai, Baldry and Rao, 2000: 25–42). Authorities worldwide are interested in reducing tax non-compliance and maximizing voluntary compliance rates (Pentland and Carlile, 1996: 269–287; Horton, 2003). Concern about the decline in voluntary tax compliance has led to numerous studies on the issue of level of compliance (Reckers and Sanders, 1994: 825–867; Ghosh and Crain, 1995: 353–365; Brand, 1996: 413–420; Tibiletti, 1999: 356–356; Yaniv, 1999: 753–765; Bishop, 2000: 335–344; Loo, 2006: 117–140). Previous studies on tax compliance revealed that the main factors affecting non-compliance include high tax rates, probability of detection, complexity of the law and the methods employed to collect taxes (Clotfelter, 1983: 363–373; McGee, 2012). Jackson and Milliron (1986: 125–165) observed that gender is one significant factor that affects the tax compliance attitude and behavior of taxpayers. Past studies have shown that females were more responsive to conscience appeal than sanction threat (Jackson and Jaouen, 1989: 31–147). Most of the recent research provides evidence on gender differences in relation to tax compliance (Cohen, Plant and Sharp, 1998: 250–270; Hasseldine, 1999: 73–89; Jackson and Milliron, 1986; Powell and Ansic, 1997: 605– 628; Roth, Scholz and Whitte, 1989; McGee, 2012; Pardisi and McGee, 2022). This paper fills a gap on that issue based on recent data provided in the WVS database, which surveyed more than 140,000 people in more than 80 countries.

3. METHODS AND DATA

The data used in the present study has been obtained from the World Value Survey database. The survey is based on national representative samples of at least 1,000 individuals, aged 18 and over. The samples are selected using random probability methods and the questions contained within the surveys generally do not deviate from the original official questionnaire. The WVS inquiries about the acceptability of various dishonest or illegal activities. The questions on the justifiability of tax evasion that is of primary interest in this article is stated as follows: “Cheating on taxes if you have the chance”. Respondents were asked to assess this statement and answer if cheating on taxes can always be justified, never be justified, or something in between. The lower the mean, the higher the opposition towards tax evasion. Value 1 means cheating on taxes is never justified

while 10 it is always justified. The data derives from the Wave 7, the most recent wave of surveys, which were distributed between 2017 and 2021.
The variables are codified in the following way:

- *Ch – Cheating on taxes*, scale: 1 - cheating on taxes is never justified, 10 - it is always justified;
- *A – Age*, scale: 1 - Up to 29, 2 - 30–49, 3 - 50 and more;
- *E – Education*, scale: 1 - lower, 2 - medium, 3 - higher;
- *I – Income*, scale: 1 - low, 2 - medium, 3 - high;
- *CG – Confidence Government*, scale: 1 - A great deal, 2 - Quite a lot, 3 - Not very much, 4 - None at all;
- *LR – Left-right political*, scale: 1–3 - left, 4–7 - center, 8–10 - right;
- *R – Religious person*: 1 - religious, 2 - not religious, 3 - atheist.

The statistical analysis is based on Spearman rank correlation test between variables and OLS cross-sectional regression models with the explained variable defined as cheating on taxes justification.

$$Ch_t = a_{0,t=0} + a_1A_{t0} + a_2E_{t0} + a_3I_{t0} + a_4CG_{t0} + a_5LR_{t0} + a_6R_{t0} + e_{t0}$$

Tests for normality of distribution and heteroscedasticity together with model parameters were calculated using Gretl.

4. RESULTS

In the first step, the mean values of answers provided by the respondents are presented with the division for a group of males and females.

Table 1. Mean values of answers regarding cheating on taxes in the groups of respondents

	World	Males	Females
Mean	2,1969	2,2882	2,1158
St. deviation	2,1895	2,2543	2,1252
N	81,024	38,369	42,597

Source: WVS, 7 wave

From the global perspective, males are characterized by a higher average acceptance towards cheating on taxes compared to females. Tests for the difference between the surveyed groups are presented in Table 2.

Table 2. Significance of the differences

	Males	Females
World	p-value = 0.0001 t = 6.59	p-value = 0.0001 t = 6.19
Males		p-value = 0.0001 t = 11.06

Source: own study

For all p-values<0.05 the difference is statistically significant, and it can be concluded that there is a difference between the surveyed groups.

In the next step, the correlation between gender, age of respondents, their education, income, confidence in government, left-right position on a political scale, religiosity variables and cheating on taxes are analyzed from a global perspective. The correlation between variables is calculated based on the non-parametric test with Spearman rho coefficient and presented in Table 3.

Table 3. Spearman correlation between mean answers regarding cheating on taxes and variables that can influence this phenomenon for the whole sample

Ch	A	I	E	CG	LR	R
Correlation p-value	-0.07 0.0000	0.05 0.0000	0.03 0.0000	0.02 0.0000	0.09 0.0000	0.05 0.0000

Source: own study

All correlation coefficients are significant. The negative sign of correlation for age indicates that the acceptance of cheating on taxes is negatively correlated with age. The interpretation of other variables is as follows: income, education level, low confidence in government, right positioning on a political scale and more skeptical religiosity are positively correlated with the acceptance of cheating on taxes.

Table 4. Heteroskedasticity-corrected OLS model, (n = 66810),
Depended variable – Ch

	Coefficient	Std. error	t-ratio	p-value
Const.	2.2663	0.0413	54.76	0.0000
CG	0.0308	0.0075	4.082	0.0000
A	-0.2012	0.0102	-19.65	0.0000
LR	0.0429	0.0023	18.30	0.0000
R	0.0334	0.011	3.276	0.0011
E	-0.0273	0.0099	-2.738	0.0062
I	0.0572	0.0102	5.603	0.0000
F (6, 66803)	136.1425	P-value (F)	0.000	

Source: own study

The results presented in Table 4 can be interpreted as follows: the lower the confidence in government, the farther right on political positioning; the less religious person, and the higher income, the higher acceptance for cheating on taxes. Opposite to the above results, the higher the age and education, the lower acceptance of cheating on taxes in a global perspective. All variables in the heteroscedastic corrected model are significant.

The significant difference between variables in the case of the male and female groups allow to analyze the factors influencing tax evasion in groups related to gender. In the first step, the male group will be analyzed and the correlation between variables is presented in Table 5.

Table 5. Spearman correlation between mean answers regarding cheating on taxes and variables that can influence this phenomenon in males group

Ch	A	I	E	CG	LR	R
Correlation p-value	-0.08 0.0000	0.05 0.0000	0.03 0.0000	0.03 0.0000	0.06 0.0000	0.06 0.0000

Source: own study

All correlation coefficients are significant. The negative sign of correlation for age indicates that the acceptance of cheating on taxes is negatively correlated with age. The interpretation of other variables is as follows: income, education level, low confidence in government, right positioning on the political scale and

more skeptical religiosity are positively correlated with the acceptance of cheating on taxes.

Table 6. Heteroskedasticity-corrected OLS model, (n = 31,618), Depended variable – Ch for males group

	Coefficient	Std. error	t-ratio	p-value
Const.	2.4941	0.0642	38.80	0.0000
CG	0.0379	0.0116	3.251	0.0012
A	-0.2332	0.0156	-14.93	0.0000
LR	0.0306	0.0035	8.592	0.0000
R	0.0331	0.0151	2.202	0.0277
E	-0.0334	0.0152	-2.195	0.0281
I	0.0452	0.0164	2.755	0.0059
F (6, 31611)	53.2141	P-value (F)	0.000	

Source: own study

The results presented in Table 6 can be interpreted as follows: the lower the confidence in government, the farther right the political positioning; the less religious person and the higher income, the higher acceptance for cheating on taxes. Opposite to the above results, the higher the age and education, the lower the acceptance for cheating on taxes from the global perspective. All variables in the heteroscedastic corrected model are significant.

In the next step, the analysis of the female group is presented. The correlation analysis is presented in Table 7.

Table 7. Spearman correlation between mean answers regarding cheating on taxes and variables that can influence this phenomenon in the female group

Ch	A	I	E	CG	LR	R
Correlation p-value	-0.07 0.0000	0.05 0.0000	0.03 0.0000	0.01 0.0052	0.11 0.0000	0.05 0.0000

Source: own study

All correlation coefficients are significant. The negative sign of correlation for age indicates that the acceptance of cheating on taxes is negatively correlated with age. The interpretation of the other variables is as follows: income, education level, low confidence in government, right positioning on the political scale and

more skeptical religiosity are positively correlated with the acceptance of cheating on taxes.

Table 8. Heteroskedasticity-corrected OLS model, (n = 35,134), Depended variable Ch for the female group

	Coefficient	Std. error	t-ratio	p-value
Const.	2.1051	0.0544	38.66	0.0000
CG	0.0265	0.0098	2.694	0.0071
A	-0.1789	0.0134	-13.31	0.0000
LR	0.0524	0.0031	16.68	0.0000
R	0.0233	0.0137	1.691	0.0909
E	-0.0314	0.0132	-2.371	0.0177
I	0.0739	0.0123	5.996	0.0000
F (6, 35127)	91.9604	P-value (F)	0.000	

Source: own study

The results presented in Table 8 can be interpreted as follows: the lower the confidence in government, the farther right the political positioning; the less religious person, and the higher income, the higher the acceptance for cheating on taxes. Opposite to the above results, the higher the age and education, the lower acceptance for cheating on taxes in a global perspective. All variables in the heteroscedastic corrected model are significant with R significant at the 10% significance level.

The summary of the results is presented in Table 9.

Table 9. The summary of results

	Ch	A	I	E	CG	LR	R
Total Sample	Correlation Regression	-0.07 -0.2012	0.05 0.0572	0.03 -0.0273	0.02 0.0308	0.09 0.0429	0.05 0.0334
Males Sample	Correlation Regression	-0.08 -0.2332	0.05 0.0452	0.03 -0.0334	0.03 0.0379	0.06 0.0306	0.06 0.0331
Females Sample	Correlation Regression	-0.07 -0.1789	0.05 0.0739	0.03 -0.0314	0.01 0.0265	0.11 0.0524	0.05 0.0233

Source: own study

When analyzing tax evasion, it can be concluded that age (A), confidence to the government (CG) and religiosity (R) influence males' decisions to the highest degree while left-right political scale (LR) is the most important in case of females' decisions. Income (I) is slightly more influencing females' decisions regarding tax evasion. It can be noticed that in all the samples there is a conflict between correlation and regression coefficients in case of education (E) – there is a positive correlation but the regression coefficient is negative. This result can indicate that education is related to the tax evasion in a more complex way, which needs to be explored in the further analysis.

CONCLUSIONS

There is a significant difference between acceptance of cheating on taxes between men and women from a global perspective. On the other hand, all factors taken into consideration influence tax evasion in the same way without distinguishing between men and women. The hypothesis is verified in a positive way, and it can be concluded that there are no differences between males and females regarding the tax evasion, however, other factors may influence this phenomenon.

In the case of education, it is difficult to state whether it is related to the acceptance of cheating on taxes in a positive or negative way. In the case of religiosity in a group of females, this variable is significant at the 10% level of confidence and may indicate a less important role in the field of tax evasion.

Summarizing, it can be concluded that the factors included in the study affect people who pay taxes regardless of the country. These results show that regardless of the tax system that is so diverse on a global scale, the nature of tax cheating is of a similar nature, and that men are more likely to cheat in this respect.

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CORPORATE INCOME TAX CHANGES IN THE CONTEXT OF EARNINGS MANAGEMENT: A REVIEW OF THE LITERATURE

Olga Krzeczewska[*] Luís Miguel Serra Coelho[**]

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CORPORATE INCOME TAX CHANGES IN THE CONTEXT OF EARNINGS MANAGEMENT: A REVIEW OF THE LITERATURE

Abstract

The purpose of the article/hypothesis: This paper aims to provide a comprehensive review of the theoretical and empirical literature regarding tax-induced earnings management. In particular, the association between anticipated tax changes and earnings management is of interest to the authors.

Methodology: This paper uses a systematic literature review to achieve its research objectives.

Results of the research: The presented research is mostly devoted to tax rate decreases and focuses on accrual-based earnings management methods. In anticipation of a tax rate change, companies shift their income from a high to a low tax rate period. Moreover, the probability of tax-induced earnings management is higher in case of extreme changes in the tax rate, larger prospects for tax savings as well as in case of private firms. This paper identifies several inconsistencies and gaps in the current literature, emphasizing that the connection between firms' characteristics, the level of book-tax conformity and the practice of earnings management remains unclear.

Keywords: earnings management, tax incentive, tax rate change, tax reform.

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[*] MA, Faculty of Economy and Sociology, Univesity of Lodz, e-mail: olga.krzeczewska@uni.lodz.pl, https://orcid.org/0000-0003-3650-2152

[**] Ph.D., Prof., School of Economics - University of the Algarve and CEFAGE-UALG, e-mail: lcoelho@ualg.pt, https://orcid.org/0000-0002-8074-4194

INTRODUCTION

Corporate income taxes have significantly changed all over the world during the 21st century (Sundvik, 2017a: 151–161), and that process has also impacted Poland via the Polish Deal reform[1]. Enterprises strive to adjust to the new legal circumstances, and one way of doing this is to exercise earnings management (EM). We still cannot find a consensual definition of EM (Walker, 2013: 445–481) but, in a seminal review on the topic, Healy and Wahlen (1999: 368) claim that it occurs when "managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company, or to influence contractual outcomes that depend on reported accounting numbers". Under this light, EM could deeply affect the firm and its stakeholders. Yet, in general, EM is legal as managers should use the accounting choices at their disposal (e.g., deciding on deferred tax, assets impairments, depreciation methods) to provide relevant, comparable, verifiable, timely and understandable financial statements to their shareholders (Healy and Wahlen, 1999: 365–383). Furthermore, EM can be induced by different incentives, which may act in the opposite direction, driving both to an upwards and downward bias in reported earnings[2].

This paper provides a comprehensive review of the theoretical and empirical literature regarding tax-induced earnings management. More specifically, the aim is to explore the link between corporate income tax changes (i.e., tax rate increases, decreases, new forms of taxation, tax holidays) and earnings management. The paper finds that the bulk of the available literature is focused on the United States and China, with only a few studies addressing this issue in Europe and in other parts of the world. Furthermore, there is evidence that the topic of tax-induced earnings management is primarily explored in the context of tax rate decreases, and it is analyzed mainly in the context of accrual-based earnings management. Generally, the change in the tax is an incentive to shift income from the high to low tax rate period. In addition, the existing research shows that the probability of tax-induced earnings management is higher when firms face bigger changes in the tax rate, larger prospects for tax savings, and in the case of private firms. Importantly, the scant academic literature that is available leaves open several research gaps that provide interesting opportunities for future research.

[1] Among other changes, at the beginning of 2021, the changes to the corporate income tax in Poland came into force. An optional new method of taxation was introduced, which is based on the Estonian tax system (the so-called "Estonian income tax"). From 2022, the subjective scope of this taxation form has been extended and some formal requirements have been abolished (PWC Portal, 2022).

[2] In the case of upward earnings management, the managers inflate profits, in case of downward earnings management they deflate profits (Ali and Bansal, 2021).

1. THE INCENTIVES OF EARNINGS MANAGEMENT

In their seminal paper, Healy and Wahlen (1999: 365–383) divide incentives to manage earnings into three groups: capital market expectations and valuation, contractual relationships based on accounting numbers, and antitrust and other government regulation. Coppens and Peek (2005: 1–17) show evidence that some earnings management types are associated with market pressure and, therefore, are specific for public firms. Furthermore, Coppens and Peek (2005: 1–17) conclude that the earnings decrease avoidance is mainly a capital-market-based driven motive to manage earnings. Ball and Shivakumar (2005: 83–128) state that private companies, in contrast, give greater priority to reducing tax expenses. The same point is raised by Sundvik (2017a: 151–161), who claims that private firms have stronger incentives to use earnings management to reduce taxes. Wong et al. (2015: 188–222), on the other hand, emphasize that tax, tunneling[3] and financial reporting incentives interplay while managers decide on their tax management strategy. In particular, according to the authors, high book management incentives and low tunneling incentives of non-state-owned companies are associated with the book-tax conforming manner of exercising EM.

Earnings management may be implemented via accounting choices that influence financial reports (AEM, accrual-based earnings management), or operational decisions, which affect both earnings and cash flows (REM, real earnings management). According to Zang (2012: 675–703), managers tend to trade off these two methods based on their relative cost. The authors stress that one of the important differences between those two EM strategies is how they affect corporate tax. In particular, real earnings management that increases income leads to higher tax costs in the current period, while accounting-based earnings management may increase income without current-period tax consequences. Similarly, Hu et al. (2015: 417–434) argue that stock-listed companies trade-off conforming and nonconforming earnings management strategies from the income tax cost perspective. In particular, firms seem to prefer conforming EM strategies when they want to turn losses into gains while avoiding penalties and detection risk. In a related paper, Simpson (2013: 869–900) claims that managers' sentiment affects decisions, reporting more conservatively during periods of low sentiment.

Many studies show that manager's motivations can be severely misaligned with the tax incentive to manage earnings. For instance, Coppens and Peek (2005: 1–17) note that small firms tend to avoid reporting small losses, though, in countries with high book-tax conformity, they do not do this. Furthermore, Moreira (2006: 1–33) finds that debt and tax incentives for small private firms influence EM in opposite directions. In fact, firms with high financial needs tend

[3] The incentive for controlling investors to transfer assets and profits from minority to majority shareholders for personal gain (Suryarini et al., 2020: 1–13)

to exercise upward earnings management, whereas firms with low financing needs focus on tax expense reduction. Andries et al. (2014) present similar results, concluding that the tax expense may be used as an EM tool, especially by highly leveraged companies. In the same vein, Dhaliwal et al. (2004: 431–459) note that the tax expense is an important tool to exercise EM since this is one of the last accounts closed before the earnings announcement.

The results provided by Kałdoński and Jewartowski (2020: 1–8) show that, in Poland, there is a negative relation between EM and the tax expenses reported by benchmark-beating firms. As the authors explain, this may be due to the wish of avoiding scrutiny by the tax authorities. As a result, for these firms, the potential benefits from tax planning are sacrificed by managers. Interestingly, Erickson et al. (2004: 387–408) find that firms that fraudulently overstate their earnings are ready to pay higher taxes to avoid detection risk. Related research by Dutzi and Rausch (2016: 1–21) and Reschiwati and Hasudungan (2020: 682–695) goes even further, concluding that when companies are in distress and generating losses, the tax incentive becomes irrelevant for their managers.

In a nutshell, the previous paragraphs indicate that tax incentives impact firms' earnings management practices. Yet, there is a significant interplay with other EM's incentives, which can lead to different outcomes depending on the specific situation of a company.

2. BOOK-TAX CONFORMITY

Several papers explore the interaction between book-tax conformity and earnings management. High conformity occurs when there is a common system for tax and accounting purposes, while low conformity signals that these systems are separated (Goncharov and Zimmerman, 2006: 41–65). Book-tax conformity varies across countries as shown by Hung (2001: 401–420) among others. Importantly, Tang (2015: 441–469) argues that high book-tax conformity leads to less earning management and tax avoidance. Blaylock et al. (2015: 141–172) support this view, claiming that high book-tax conformity mitigates both the incentive to manipulate earnings upwards (due to increases tax expenses) and downward (since it results in low earnings being reported to investors). In the same vein, Sundvik (2017b: 31–42) empirically shows that firms in jurisdictions with low book-tax conformity tend to exhibit higher levels of earnings management. Watrin et al. (2012: 55–89) and Blaylock et al. (2015: 141–172) indicate opposite results, reporting that high book-tax conformity generally leads to more intense EM. Moreover, Blaylock et al. (2015: 141–172) highlight that high book-tax conformity is associated with the lack of an alternative measure of

performance, i.e., taxable income, which reduces the possibility to detect earnings management. This is also associated with the loss of information, which may increase the extent to which companies smooth their earnings.

There is also a research stream that investigates the impact of the changes in book-tax conformity on earnings management behavior. For instance, Karampinis and Hevas (2013: 218–247) investigate the effects of the International Financial Reporting Standards (IFRS) implementation on the Greek market. The authors note that such an event, which took place in 2005, reduced the book-tax conformity, disentangling financial income from tax implications. Karampinis and Hevas (2013: 218–247) find that Greek firms typically managed their earnings downwards in the pre-IFRS period. Yet, after the adoption of the IFRS, the same companies no longer exhibit the same propensity to engage in EM to reduce their reported earnings. In a similar study, Goncharov and Zimmermann (2006: 41–65) investigate the Russian case, which moved from a high to a low book-tax alignment system. The authors report that such change led public firms to improve their earnings quality more than their private counterparts, a result they attribute to different reporting incentives. Interestingly, a cross-country analysis conducted by Ugrin et al. (2017: 140–151) shows that the adoption of IFRS generally leads to an increase in upward earnings management, though the results differ depending on culture characteristic. In particular, more upward EM is associated with higher power distance, uncertainty avoidance, individualism, short-term orientation, and indulgence.

In summary, the existing literature clearly suggests that the level of book-tax conformity affects the firms' earnings management behavior. Yet, we are still to reach a consensus about the particulars of such a relationship.

3. EARNINGS MANAGEMENT IN ANTICIPATION OF CORPORATE INCOME TAX CHANGES

There is also a research stream that examines how anticipated changes in income tax impact EM. Table 1 summarizes this literature:

Table 1. Studies on earnings management exercised in the reaction to tax changes

Study	Country	Sample	Tax change	The earnings management behavior observed
Scholes, Wilson and Wolfson (1992)	US	2812 firms	Reduction of income tax rate	Acceleration of selling, general, and administrating (SG&A) expenses and deferment of gross margin recognition in anticipation of the change (REM)
Boynton, Dobbins, and Plesko (1992)	US	414 firms (manufacturing and transportation)	Alternative minimum tax	The usage of unusual income-decreasing discretionary accruals in the year of the tax change; asset size negatively correlated with EM magnitude (AEM)
Porcano (1997)	US	715 stock-listed companies (mostly manufacturing – 69%).	Two cases of net capital gains tax rate increase and two cases of tax rate reduction	The correlation of the magnitude of EM with the magnitude of the tax change. Firms prefer to dispose of assets with lower nontax costs to accomplish EM. Ambiguous relation of firm characteristics (i.e., firm size, leverage, and income position) with capital gains taking. (REM)
Guenther (1994)	US	487 firms (manufacturing, wholesale, retail, services - other than financial services)	Reduction of income tax rate	Income decreasing accounting accruals in the year prior to the decrease in the tax rate (the large firms exercise downward EM, shifts in current accruals positively correlated to leverage). The negative current accruals for large firms; positive correlation of current accruals and debt level; irrelevancy of the ownership. (AEM)

Lopez, Regier, and Lee (1998)	US	279 firms- the reduced sample of Guenther (1994)	Reduction of income tax rate	Accrual-based earnings management in the year prior to the decrease in tax rate is more probable and of a greater magnitude for tax-aggressive entities. (AEM)
Roubi and Richardson (1998)	Canada, Singapore, Malaysia	Non-manufacturing corporations; 102 firms in Canada, 149 in Malaysia, 126 in Singapore.	Reduction of income tax rate	The evidence of managing the discretionary current accruals in Canada and Singapore in the period preceding the tax change; weak evidence in Malaysia. (AEM)
Monem (2003)	Australia	45 stock-listed companies (gold-mining industry)	Introduction of Australian Gold Tax	Downward earnings management before the tax implementation and upward after the change. (AEM, REM)
Lin (2006)	China	112 foreign investment enterprises	5-years tax holiday and then the gradual tax rate increase	Companies report higher discretionary current accruals during the years prior to tax-rate increases (AEM)
Marques, Rodrigues and Craig (2011)	Portugal	6652 private companies	Special payment on account	Firms with higher average income tax rates are prone to use EM more. (AEM)
Hashim, Haniff, Rahman (2012)	Malaysia	177 public listed companies; 531 company-years	Tax waiver year	During the downturn, the magnitude of EM is not related to tax waiver year in a way consistent with tax-saving incentives. (AEM)
Watrin, Pott, Ullman (2012)	Germany	2816 companies (2104 private and 712 public) limited companies; 20 614 firm-year observations	Reduction of income tax rate	In high book-tax conformity country, tax-induced incentive affects private, but no public companies. (AEM)

Lin, Lu, and Zhang (2012)	China	959 - 1158 firms; depending on the model estimated	Reduction of income tax rate	The evidence of managing the discretionary current accruals before the tax change. The EM is less obvious for state-owned companies, with the audit committee on board, voluntarily disclosing certified internal control reports.
Zeng (2014)	China	91 stock-listed real estate companies	Reduction of income tax rate	Companies manipulate income upward in the low-tax-rate periods and downward in the high-tax-rate periods using both real and accrual-based earnings management. Ownership structure affects the level of EM. (AEM, REM)
Wong, Lo, and Firth (2015)	China	438 stock-listed companies; 2628 firm-year observations	Increase of income tax rate	Upward EM through book-tax differences is most likely in anticipation of tax increase (the firms inflate taxable income without managing book income). However, firms with high book management incentives or lower tunneling incentives exercise EM in a book-conforming manner)
Sundvik (2016)	Sweden	3 254 private firms	Reduction of income tax rate	Downward EM before tax rate decrease. Mostly EM is driven by accounts receivable. EM behavior is persistent over time. (AEM)
Wali (2021)	Netherlands, Germany	1350 firm-years observations for the Netherlands and 1850 firm-years for Germany	Reduction of income tax rate	Firms with prospects for higher tax savings exercise EM. (AEM)

Bai, Song, and Li (2021)	China	639 stock-listed manufacturing companies	Reduction of income tax rate	Private companies exercise more downward EM in anticipation of tax rate reduction (AEM)

Source: own elaboration based on the literature review

The introduction of the Tax Reform Act of 1986 (Public Law, 99–514) in the United States initiated research on tax-induced earnings management in this country. For instance, Scholes et al. (1992) investigate the impact of the gradual reduction (from 46% to 34%) of the corporate tax rate in this country in the '80s and find that companies shift their gross margin in anticipation of such an event, a phenomenon that is particularly clear within the group of the largest companies. In a follow up study, Guenther (1994: 230–243) reaches the same conclusion after revisiting the evidence for the same tax reform. Lopez et al. (1998: 37–57) add that tax-aggressive companies are more prone to reduce income using the discretionary accruals before the tax rate cut and find that the magnitude of earnings management is higher for these companies. Boynton et al. (1992: 131–153) explore the effects of the alternative minimum tax (AMT), which was introduced by the Tax Reform Act of 1986. The authors report that the companies potentially exposed to the AMT engaged in income-reducing EM practices using accruals in 1987. Porcano (1997: 395–408) investigates other changes in the US tax law, namely two cases of net capital gains, tax rate increases and two tax rate decreases. The author notices that the magnitude of earnings management is correlated with the scale of the income tax change. Interestingly, the author finds that EM does not always affect net capital gains in the expected direction. Furthermore, Porcano (1997: 395–408) shows that some firm's characteristics such as size, leverage, and income position are important to understand the magnitude and direction of the tax-induced earnings management, although a clear pattern of correlation between these factors seems inexistent.

Research on tax-induced earnings management also exists outside the United States. For instance, Roubi and Richardson (1998: 455–467) find evidence of earnings management induced by changes in statutory corporate income tax rates in Canada and Singapore. In particular, these countries' companies accelerated their expenses in the year before the introduction of tax changes and deferred revenues to the year following tax rate increases. Roubi and Richardson (1998: 455–467) also consider the case of Malaysia but their results are not statistically significant. They attribute this finding to cultural factors, namely the relatively high level of authority and enforcement built into the country's accounting system. Monem (2003: 747–774) looks at the effects of the introduction of the gold tax in Australia. The author shows that such industry-specific tax induced downward

reported earnings management in the years preceding the change (as gold companies wanted to discourage the government from imposing the tax) and upward real EM afterwards (allowing the firms to benefit from specific legislative arrangements). Lin et al. (2012: 19–44) report earnings management practices in China following a reduction of the country's corporate income tax (from 33% to 25%) in 2007. Results are, however, weaker for companies with a greater percentage of shares owned by state-owned entities, and those with an audit committee on the board that voluntarily discloses internal control reports. A few years later, Bai et al. (2021) also find that the anticipation of a decrease in income tax rate induces earnings management in China. Importantly, they show that the level of earnings management is lower for state-owned entities than for private firms. In unrelated research, Zeng (2014) finds evidence of both real and accrual-based earnings management in China due to a tax rate reduction. In addition, the author documents that the ownership structure significantly affects the earnings management behavior of Chinese firms. On the other hand, Bai et al. (2021) report that Chinese stock-listed companies with a negative net profit in the previous period prefer to reverse losses than to benefit from tax savings. According to the authors, this is mainly to avoid negative consequences, such as stock trading restrictions or delisting, which arise from specific market regulation directives in China. Lin (2006: 163–175) considers the special case of foreign investment enterprises in China. Specifically, he investigates to what extent such companies change their reporting behavior in response to a known schedule of tax-rate increases. Lin (2006: 163–175) finds that such firms manage their earnings upward to take advantage of the lower tax rates that are available for them in certain years. Finally, Wong et al. (2015: 188–222) show that Chinese companies generally increase their reported income in a book-tax nonconforming manner before a corporate tax rate increase in order to reduce the risk of aggressive financial reporting detection.

A few other studies explore the European context. For example, Marques et al. (2011: 83–96) investigate the impact of the introduction of the 'special payment on account' system in Portugal. The authors show that such a change leads companies to exercise earnings management to minimize their tax liability, especially those within the highest average income tax rate. Sundvik (2016: 261–286) examines the impact of two corporate income tax reforms in Sweden and finds downward EM practices before the reduction in the corporate income tax rate. The author also concludes that such income-decreasing behavior in anticipation of the tax changes is persistent over time. Watrin et al. (2012: 274–302) highlight that only private companies operating in Germany, a country with a strong book-tax conformity, are prone to exhibit tax-induced earnings management. Wali (2021: 1–12) revisits this theme using a sample of companies operating in the Netherlands and Germany. He finds that EM practices are only

common among the sample firms that expect large tax savings following a change in the tax law. Wali (2021: 1–12) concludes that individual firm characteristics like size, long-term debt and ownership are not likely to affect the EM of the companies; only their combination in particular manners seem to have such an effect.

The present subsection shows that a number of studies already explore the issue of EM in both high (e.g., Germany, Sweden) and low book-tax conformity countries (e.g., the Netherlands, Canada, Singapore) (Hung, 2001: 401–420) [Table 1]. Yet, the bulk of the available literature is focused on the US and China and explores accrual-based earnings management strategies. Furthermore, most of the available studies are devoted to changes in the income tax rate, namely tax rate decreases (11 studies out of 17 in Table 1). In general, in anticipation of a tax rate change, enterprises shift their income from a high to low tax rate period. Moreover, it seems that the probability of tax-induced earnings management is higher for bigger changes in the tax rate, or larger tax-savings and in the case of private firms. Finally, the link between certain firm characteristics (e.g., size or leverage) and the EM is clearly not straightforward.

CONCLUSIONS

The tax-induced earnings management topic is still developing. In fact, most of the studies specifically devoted to tax-induced earnings management only consider situations where the income tax rate is reduced, focusing almost entirely on the accrual-based earnings management method. The general conclusion of these studies is that companies tend to shift their income from high to low tax rate periods when they anticipate a reduction in the corporate tax rate. Furthermore, the existing literature suggests that the probability of tax-induced earnings management is higher for more extreme changes in the tax rate, when there are prospects of high tax savings, and in the case of private entities. It is, however, unclear whether more earnings management is associated with high or low book-tax conformity, especially in the context of tax rate changes.

This study shows that, to date, we still do not know how the magnitude of earnings management induced by tax changes is conditional on the financial health of the companies. Moreover, there is a lack of studies concerning managers' sentiment in the context of tax-induced earnings management, which may constitute a research gap. Additionally, there are no studies concerning changes in corporate income tax in Poland. The new tax legislation (mentioned in the article) gives opportunities for further research.

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TRADING VOLUME AND CAPITAL GAINS TAX - EVIDENCE FROM SELECTED STOCK MARKETS WITH DIFFERENT CHARACTERISTICS

Agata Gniadkowska-Szymańska* **Mariya Gubareva****

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TRADING VOLUME AND CAPITAL GAINS TAX - EVIDENCE FROM SELECTED STOCK MARKETS WITH DIFFERENT CHARACTERISTICS

Abstract

The purpose of the article/hypothesis: The goal of this paper is to investigate the relationship between capital gains tax paid by investors and the liquidity of the market, expressed by the trading volume.

Methodology: In this study, the measure of market liquidity, expressed by the trading volume, has been proposed as a variable that may be influenced by taxes on capital gains. The article presents a new approach to the analysis of the liquidity of capital markets.

Results of the research: Based on the data analysis, it was found that the higher the taxes on capital gains are paid by investors, the less likely they are to take their profits, and this is the situation on a highly developed market (the analysed US market). However, as it turns out from the results obtained, in the case of European countries representing stock markets after the systemic transformation, the higher the taxes on capital gains, the higher the share trading in these markets should be.

Keywords: trading volume, capital gains tax, stock markets, market liquidity, taxes.

JEL Class: F38, G14.

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

** Professor, ISEG – Lisbon School of Economics and Management, Portugal and SOCIUS/CSG - Research in Social Sciences and Management, Lisbon, Portugal, e-mail: mgubareva@iseg.ulisboa.pt, https://orcid.org/0000-0001-6829-7021

INTRODUCTION

The assessment of the economic conditions and liquidity of enterprises on the capital market is related to the purpose of their operations. One should also take into account the influence of financial liquidity on the economic condition of enterprises in the context of investors' expectations guided by decision-making rates, which include also the taxes. The size effect is related to the internal demand, the number of sectors, and the external capital amount that must be moved into the economy to influence its behavior. On the other hand, the stock market may affect economic activity through the creation of liquidity. Liquid equity markets allow for less risky and more attractive investments because they enable investors to purchase financial instruments and sell them when necessary.

The paper assumes that there is a significant relationship between capital gains tax paid by investors and the liquidity of the market, the latter being gauged by the trading volume. In addition, it can be noted that the research related to the impact of taxes on capital gains paid by investors on the liquidity of individual markets measured by the volume of turnover has not been widely discussed yet. Determining these effects can help to understand what factors may influence investors' ability to predict the future investment decisions.

The study was conducted in four selected stock markets differing in terms of development and size. The Hungarian market that is a stock market after the system transformation, is considered quite small and is still developing. The Italian market is classified as one of the developed but medium markets. The Polish market is a large market for Central and Eastern Europe and belongs to the group of developed markets. The American market is a large and well-developed stock market. In all these markets, investors pay taxes on capital gains, which is a tax on the profit earned on the sale of a non-held asset.

1. LITERATURE ANALYSIS

According to the literature, there is a relationship between the size of the market, its development and the growth of the economy. Nordin and Nordin (2016: 259–265) found that larger, more efficient stock markets positively influence economic growth. Ibrahim and Alagidede (2018: 95–104) showed that integrating markets may improve the rate of economic growth. On the other hand, Orhan et al. (2019: 6684) deny the role of the market in that growth, and Hossin and Hamid (2021) also share this view.

Taking into consideration large and small economies, first, the definition of those phenomena should be analysed. According to Ouyang (2016: 31–56), a large country can be characterized by a territorial area and population scale. Youhao

(1999) stated that a large country should have a vast area, abundant resources, a huge domestic market, a complete system of industrial sectors, a fairly large gross domestic scale, and considerable influence on the world economy. Ouyang (2016: 31–56) used the term CAOLC (Comprehensive Advantage of Large Country) to describe large countries, taking into consideration domestic product and the cultivated land area. Saccone and Deaglio (2020: 267–306) offer a new country classification system defined in relative terms and jointly based on the level and the medium-long term rate of growth of per capita income. The classification system identifies four categories of economies: poor (low income – low growth), emerging (low income – high growth), booming (high income – high growth) and affluent (high income – low growth).

Demirgüç-Kunt and Levine (1996: 223–239) found that countries with better-developed stock markets also have better-developed banks and non-bank financial intermediaries. In the long run, stock market development supports future economic growth. As shown by Samarasinghe and Uylangco (2021), the stock market may affect economic activity through the creation of liquidity. Liquid equity markets make investments less risky and more attractive because they allow savers to purchase financial instruments and sell them when necessary. The liquidity of the market can either support or hurt economic growth, but generally, large markets tend to be less volatile, more liquid, and less concentrated than smaller markets (Bakri et al., 2020). The works by Amihud and Mendelson (1986a: 223–249; 1986b: 43–48), which in a theoretical manner and through empirical research, showed the existence of a relationship between the rate of return on shares and the liquidity measured by the spread on the American market, are considered to be of special importance in this respect. Subsequent studies confirmed the thesis that liquidity exerts a significant influence on share prices and their rates of return (Shannon, Reilly and Schweihs 2000: 3–28; Chordia et al., 2000: 3–32; Dater et al., 1998: 203–219; Chan and Faff 2005: 429–458; Acharyal and Pedersen 2005: 375–410). The liquidity of shares is difficult to define and measure. However, the commonly accepted definition of liquidity is the ability to trade assets in large quantities without affecting the prices. There are numerous liquidity measures, however, the stock trading volume is the most popular. Research on the impact of trading on prices as a measure of liquidity was presented, among others, by Bertsimas and Lo (1998: 1–50), Amihud et al. (2012), Pastor and Stambaugh (2003: 642–685), Abankwa and Blenman (2021: 100683) and Sadka (2006: 309–349).

It is also possible to find an effect of a new exchange in some of the exchanges investigated in this paper, because two of them – Poland and Hungary – represent economies after the transition from the communist system, and their exchanges can be considered new. Greenwood and Jovanovic (1990: 1076–1107) and King and Levine (1993: 513–542) showed that new stock markets provide

timely and accurate information about companies to investors. Moreover, capital gains tax has a positive or negative impact on liquidity and stock returns. It is a puzzle that stock markets across the world are yet to answer. Shareholders returns are in the form of dividends issued and the capital gains realised from the sale of investments. Capital gains tax is levied on the capital gains realised by investors on sale or transfer of chargeable assets such as marketable securities. Obadha (2019), Globan and Škrinjarić (2020: 299–329) found a correlation between stock returns and capital gains tax. There were abnormal returns and cumulative abnormal returns after capital gains tax which were insignificant. Karinga (2015) in her studies concludes that the announcement of capital gains tax had a positive effect on the performance of stocks at the Nairobi Securities Exchange. However, Akindayomi (2013: 1–12) had found in his study that capital gains realization, not capital gains tax rates impact stock market investments in the U.S.

2. DATA, METHODOLOGY AND TESTABLE HYPOTHESES

The main aim of that research is to find the relationship between taxes and the liquidity, which is distinguished by the trading volume in the period 2016–2020. The study was conducted on monthly data for the period from 31.07.2016 to 31.12.2020. The survey covers the WIG index for the Polish market, the BUX index for the Hungarian market, the S&P500 index for the US market and the FMIB index for the Italian market. All data related to the economy and financial market come from the World Bank database and from the websites of individual exchanges.

The entire period was adopted for the analysis in order to better show the existing relations between taxes and the liquidity. In subsequent studies, the analysis will be extended to sub-periods before and during the COVID-19 pandemic, but such an extension requires the collection of more data, mainly from the pandemic period, in order for the obtained result to be reliable. The problem of "thin trading" raised by, among others, Dimson (1979: 197–226), or long periods in which there are no quotations can cause load estimation of the beta coefficient or sensitivity to macroeconomic variables.

The following hypothesis has been formulated: the capital gains tax paid by investors is expected to influence the trading volume in shares on different exchanges.

The equation presented below was used to test the hypothesis concerning the impact of the amount of taxes on capital gains on the obtained liquidity, which is distinguished by the trading volume:

$$V_t = \propto_0 + \propto_1 Tax_{ti} + \propto_2 I_t + \propto_3 U_t + \propto_4 PL_t + \propto_5 H_t \varepsilon_t \qquad (1)$$

where:
V_t – trading volume (in US dollars);
Tax_{ti} – the amount of capital gains tax 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;
P_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 study was conducted using cross-sectional regression analysis and panel data. Cross-sectional regression analysis was conducted by estimating models with fixed and random effects for various combinations of the effects. As the models with random effects failed to yield statistically significant results, only the models with fixed effects were analysed further. 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, 2017). Accordingly, Durbin Watson and White's tests are conducted to test for any violation of the above stated assumptions. The independent variables were not collinear 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).

Fixed effect models were applied as well, and they are a class of statistical models in which the levels (i.e., values) of the independent variables are assumed to be constant (i.e., constants) and only the dependent variable changes in response to the levels of the independent variables. This class of models is fundamental to general linear models that underpin regression analysis with fixed effects and analysis of variance with fixed effects. Fixed effects are variables that are constant for individuals; these variables, such as age, gender and ethnicity, do not change or change at a constant pace over time (Wooldridge, 2005: 385–390; Imai and Kim, 2021: 405–415).

3. RESULTS AND ANALYSIS

Results of the analysis are presented below. First of all, the summary statistics of the sample taken into consideration are presented in Table 1.

Table 1. Summary statistics of the variables

	Mean	Mediana	S.D.
Volumen (in US dolars)	14 079 660 490,13490,13	4 025 071 302,50	18 966 788 587,99
TAX	2,021222222	1,8935	0,953171034

Source: own study

The results of OLS regression with fixed effect estimation for the capital gains tax paid by investors that may influence the shares trading volume in selected markets are presented in Table 2. The model as presented in equation (1) was tested in the first place.

Table 2. The OLS Regression Results with fixed effects estimated for the whole period from 2016 to 2020 for all countries

	Sample	const	VAT	Italy	Poland	USA	Hungary	F-stat.
Whole sample	216	1,90488e+010 *** (t = 4,995)	−2,16245e+09 * (t = - 1701)	−1,92582e+010 *** (t= -4,901)	1,21383e+09 (t = 0,3091)	1,64763e+010 *** (t = 4,143)	−7,65440e+08 (t = - 0,1948)	<0,0001
ITALY	54	−6,29730e+010 *** (t = -6,480)	2,93542e+010 *** (t = 7,552)					<0,0001
POLAND	54	−6,02330e+09 ** (t = -2,612)	5,35734e+09 *** (t = 3,053)					0,013824

HUNGARY	54	−1,49483e+08 ** (t = -2,210)	2,12769e+08 *** (t = 3,185)					0,009639
USA	54	5,04355e+010 *** (t = 7,173)	−1,71247e+09 (t = -0,8005)					<0,0001

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

Source: own study

When the total sample is taken into consideration, the capital gains tax paid by investors influence the share trading volume in a negative way. It can be concluded that the higher the capital gains tax are paid by investors, the less traded stocks on the analysed markets. The obtained results for the total sample confirm the hypothesis put forward in the study that there is a relationship between taxes on capital gains paid by investors and the volume of trading in shares on the analysed markets. When our analysis focuses on individual countries, it turns out that in three European countries (Poland, Italy and Hungary) we can observe a positive and statistically significant impact of taxes on capital gains on the trading volume. It is in line with the research presented by Obadha (2019), Globan and Škrinjarić (2020: 299–329). The positive impact of taxes on capital gains means that along with the increase in these taxes, the trading volume of stocks in selected markets should increase. Such a dependence may result from the fact that the analysed European markets are classified as developing markets (Hungary, Poland) or medium markets (Italy). That relation has not been observed on the US market, which is considered the most developed and the largest of the analysed markets. In this case, the change determining taxes is statistically insignificant, which results in the rejection of the hypothesis put forward in this paper.

CONCLUSIONS

It is quite difficult to capture the relationship between the liquidity of a company's shares and taxes on capital gains. Stock market investors often pay attention to only one of these aspects. Capital gains tax is a cost to each investor, but it is a tax that will not be avoided when investing in securities. Each country has its

own tax system, but the tax on capital gains comes at different rates almost everywhere. The higher the taxes of this type, the more reluctant investors will be to realise their profits, and this is what the situation looks like in a highly developed market (the analysed US market). However, as it turns out from the results obtained, in the case of European countries representing stock markets after the systemic transformation, the higher the taxes on capital gains, the higher the share trading in these markets should be. It may result from the specification of these markets, which are still the developing ones.

Further research can be related to an analysis divided into sub-periods related to the COVID-19 pandemic. The study will also include other countries whose tax systems are different from those currently analysed and their capital markets are at different stages of development (e.g., the Baltic Countries, France, Germany or the Great Britain).

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WIELKOŚĆ OBROTU A PODATEK OD ZYSKÓW KAPITAŁOWYCH – ANALIZA NA PODSTAWIE WYBRANYCH RYNKÓW AKCJI

Streszczenie

Cel artykułu/hipoteza: Celem niniejszego artykułu jest zbadanie zależności między podatkiem od zysków kapitałowych płaconym przez inwestorów a płynnością rynku wyrażoną wielkością obrotu.

Metodyka: W niniejszym opracowaniu jako zmienną, na którą mogą wpływać podatki od zysków kapitałowych, zaproponowano miarę płynności rynku, wyrażoną wielkością obrotu. Niniejszy artykuł przedstawia nowe podejście do analizy płynności rynków kapitałowych.

Wyniki/Rezultaty badania: Na podstawie analizy danych stwierdzono, że im wyższe podatki od zysków kapitałowych płacą inwestorzy, tym będą oni mniej skłonni do realizacji swoich zysków i tak wygląda sytuacja na wysoko rozwiniętym rynku (analizowany rynek amerykański). Jednak, jak wynika z uzyskanych wyników, w przypadku krajów europejskich reprezentujących rynki giełdowe po transformacji systemowej, im wyższe podatki od zysków kapitałowych, tym wyższy powinien być obrót akcjami na tych rynkach.

Słowa kluczowe: podatki, podatek od zysków kapitałowych, rynki kapitałowe, wielkość obrotu, płynność rynków.

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

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 11a) "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 cooperation 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:

$$R_t = \propto_0 + \propto_1 Tax_{ti} + \propto_2 GDP_{ti} + \propto_3 CPI_{ti} + \propto_4 I_t + \propto_5 U_t + \propto_6 PL_t + \propto_7 H_t\ \varepsilon_t \quad (1)$$

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 collinear 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 H0 - 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

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

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

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

JEL Class: F42, G12, G18.

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COSTS AND TAXES IN THE LIGHT OF FINANCIAL MANAGEMENT IN COMPANIES LISTED ON WSE

Katerina Lyroudi* **Monika Bolek****

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COSTS AND TAXES IN THE LIGHT OF FINANCIAL MANAGEMENT IN COMPANIES LISTED ON WSE

Abstract

The purpose of the article/hypothesis: The goal of this paper is to present costs and taxes as a part of financial management process in companies listed on the WSE. In the hypothesis it is expected that costs influence taxes paid by companies in a negative way due to the tax avoidance purpose attitude presented by managers, and as a result, both liquidity and debt levels are influenced.

Methodology: Correlation coefficients and regression models are evaluated to find the answers for the research questions related to the relationships between tested variables.

Results of the research: The correlation between costs and taxes is negative as expected, as well as their relationship with the liquidity. Contrary to the expectations, the correlation between taxes and costs is mostly positive, alike the relationship between liquidity and debt. Findings are characteristic for the Polish market that is rather conservative in the approach to taxes, liquidity and leverage strategies compared to other developed markets. These findings prove that liquidity and debt management issues are subjective and related to the market behavior such as tax evasion attitudes.

Keywords: costs, taxes, liquidity, capital structure.

JEL Class: M21.

* PhD, Hellenic Open University, Patra, Greece, e-mail: lyroudi.aikaterini@ac.eap.gr,
** PhD, Faculty of Economics and Sociology, University of Lodz, e-mail: monika.bolek@eksoc.uni.lodz.pl, https://orcid.org/0000-0001-9376-1105

INTRODUCTION

From the point of view of governments, taxes constitute their main source of revenue and are considered in positive terms. However, from the viewpoint of companies that have the obligation to pay their corporate taxes, this issue is something to be avoided as much as possible, and since it cannot be extinct, many enterprises try to minimize it. If a firm wants to avoid paying high taxes, it must show high levels of various types of costs. Hence, the earnings before taxes will be as low as possible, and the taxes based on that, will be low too. Such decisions, very often related to the personal view on cheating on taxes affect the policy of companies in the fields of financial liquidity and capital structure management.

The goal of this paper is to present costs and taxes in companies in the light of financial management concepts related to liquidity and capital structure, as well as to test the hypothesis that there exists a significant relationship between taxes, costs and financial management strategies. A negative relationship between corporate costs and corporate taxes is expected, and the same situation applies to a negative relationship between taxes, liquidity, and external financing. The other research question that arises is what types of costs play the most significant role in reducing the earnings before tax and influence corporate taxes. We can distinguish the cost of goods sold or the cost of revenues, the depreciation cost, the selling and other administrative expenses as well as the research and development ones. Looking for the explanation of the main goal provided in this paper, we attempt to evaluate whether there is any relationship between the level of taxes and the financial liquidity measured in dynamic (CCC – cash conversion cycle) and static ways (CR – current ratio). When a firm pays its taxes due, its most liquid assets are being reduced, so the less taxes, the better its liquidity position. On the other hand, fewer liquid companies with liquidity problems may execute the strategy of avoiding paying taxes. It can be also a behavioral phenomenon related to the need of possessing liquid assets to reduce risk.

Avoidance of taxes may be the main driver of decisions made by managers that influence the strategies performed by companies. It can partially explain various theories in the field of optimal capital structure. Avoidance of taxes may be the main driver of decisions made by managers that influence the strategies performed by companies. It can partially explain various theories in the field of optimal capital structure.

A company's capital structure is the proportion of debt and equity capital that is used to finance its assets and is represented by the debt-to-equity ratio (DE). The mix of these sources of financing that maximizes the value of the firm is its optimal capital structure and is one of the goals of firm's management.

According to Modigliani and Miller (1958: 261–297, 1963: 433–443), if we assume that there are taxes to be paid by companies, the firm can increase its value by preferring to finance its assets and investments more with debt than equity capital, because of the debt tax shield, which allows the firm to pay less taxes. In other words, more debt financing indicates more tax deductions, and less taxes to be paid. The present analysis is based on companies listed on the Warsaw Stock Exchange in Poland, a transition economy that could give different results from the previous studies that mostly analyzed the developed economies of the USA and the UK.

The results of our study will enrich the pertinent literature, since more light will be shed from the point of view of a transition economy on the issue of the tax management, or on the influence of taxes on the firm's value. Our study can also contribute to the decision-making process of the company managers regarding the strategic decisions on the optimal capital structure, liquidity and the handling of taxes.

The paper is structured as follows. The next section includes the analysis of the literature. Then, the data and methodology are presented followed by Section 3 that presents and discusses the empirical results. The last section contains a summary and concluding remarks as well as ideas for further research.

1. REVIEW OF LITERATURE

Since 1963, based on Modigliani and Miller's (1963: 433–443) statements with the assumption that there are perfect capital markets and corporate taxes, for the same level of risk, the value of a levered firm is higher than the value of an unlevered firm to an amount equal to the gain from leverage. Later, Brennan and Schwartz (1978: 103–114) and Chen (1978: 863–877) concluded that the optimal level of leverage is determined by a trade-off between the expected bankruptcy costs if there is too much leverage and the tax deductibility of interest payments of the company's debt. In the decade of the 1990's, Harris and Raviv (1990: 321–349), Stulz (1990: 3–28), Barclay and Smith (1995: 609–631) stated that the main determinants of a firm's capital structure were taxation and agency costs. However, the relevant empirical studies on whether taxes affect debt financing have revealed conflicting and/or inconclusive results. These finding can be related to some external issues that can influence the decisions of managers and value of companies, such as costs management and taxes due.

DeAngelo and Masulis (1980: 3–81) found a positive relationship between the effective corporate tax rates and leverage because of the advantage of debt financing due to the tax deductibility of interest. Jensen (1986: 323–329) implied that companies were expected to use debt in financing their investment

projects to gain from tax shields and to diminish the agency costs arising from the agency conflicts between managers and owners. Furthermore, because of the debt covenants which implied that debtholders were analyzing thoroughly the underlying company, the performance of that company would be superior, since the managers would work harder and more efficiently.

Lasfer (1995: 265–285) examined empirically the effect that corporate taxes and agency costs had on the capital structure of the corporations. He used the ratio of long-term debt to capital employed as the dependent variable for both long-term and medium-term debt. He found that there was a significant negative relation between leverage and Tobin's q, total assets, beta, and managerial ownership. If Tobin's q reflects the investment opportunities, these results imply that firms with high growth options most likely will not have free cash flow problems and they will use less debt financing. Also, companies with high managerial ownership issue less debt, which supports the agency theory. A positive relationship between the level of leverage and its lagged value and a weak relationship between leverage and the firm's effective tax rates was found. Hence, he inferred that in the short run, the companies determine their capital structure to reduce their potential agency costs and not to gain from tax shields. His results contrasted with the tax hypothesis, since he found that tax-exhausted companies had a higher level of debt in their capital structure than tax-paying companies. This implies that taxation does not influence the capital structure of the companies in the short-run, while in the long-run, companies that have no benefits from tax shields and companies that are owned by managers issue less debt.

Lasfer's findings (1995: 265–285) and regression results indicated that leverage is not affected by corporate tax rates, similarly to Myers (1993). When considering large firms, it is assumed that they will be more diversified (hence, less risky), they will have a higher liquidation value and more redeploy able assets. For this group of firms, their results were consistent with Bradley et al. (1984: 857–878), Williamson (1988: 567–592), Titman and Wessels (1998) and Harris and Raviv (1990), in other words, the higher the value of a firm, the higher its leverage. Myers (2001: 81–102) argued that agency problems and conflicts could cause significant reasons for a company to hold liquid assets and that would also influence its capital structure. Companies with more growth opportunities should hold more cash and all the firms should monitor their liquidity in relation to their debt structure.

There are empirical studies which have found that more liquid companies can afford more debt and have lower costs in monitoring them, so they depict a positive relation between liquidity and leverage, such as Williamson (1988: 567–592), Shleifer and Vishny (1992: 1343–1366), Anderson (2002: 1–29) and others. On the other hand, De Jong et al. (2008: 1954–1969), Lipson and Mortal (2009:

611–644), Šarlija and Harc (2012: 30–36) and others have found that more liquid companies have less debt, because they use the additional liquidity to finance their activities internally. Anderson (2002: 1–29) for a sample of the UK and Belgian companies examined the relationships among the firm's financial structure, its choice of liquid asset holdings and growth. The results revealed a positive relationship between leverage and liquid asset holdings.

Weichenrieder and Klautke (2008) tried to analyze the corporate capital structure from a public finance perspective, through a theoretical model by evaluating the efficiency costs of a distorted financial structure. Then they attached numbers to the cost of financial distortions and developed an example suggesting that a 10% difference between the corporate tax and the personal income tax may lead to yearly efficiency costs per unit of total assets that lie between 1.3 and 3.3 percent of the nominal interest rate. A number of empirical studies have tried to analyze the correlation between the corporate tax rate and the corporate debt ratio, but the results are not consistent and vary too much.

Sussman and Olivola (2011: 1–19) for the USA market conducted several experiments to investigate whether US citizens are tax averse or not. Their results indicated that US citizens did not like paying taxes and demonstrated a tax averse behavior. They were willing to make sacrifices to avoid paying any taxes whereby they would not make to avoid other even larger costs but not related to taxes. In other words, the desire of the Americans to avoid taxes was more than rational economic behavior that determines that someone would always try to avoid a monetary cost and from two costs would always try to avoid the highest. Hence, the authors concluded that US citizens disliked taxes for more reasons than monetary costs, such as political and/or ideological factors. Irrational decisions of entrepreneurs regarding costs and taxes influencing the policy of a company can be considered in terms of behavioral biases, too.

Šarlija and Harc (2012: 30–36) investigated the effect of liquidity on the capital structure of Croatian firms and found a statistically significant negative correlation between liquidity and leverage ratios. The results showed that there was a statistically significant negative relation between leverage ratios and the structure of current assets. Bolton et al. (2014: 1–61) focused on financially constrained firms and following the dynamic trade-off theory, they analyzed a model of optimal capital structure and liquidity choice. Their proposition was a valuation model for debt and equity in the presence of taxes and external financing costs. They considered expected tax advantages of debt and bankruptcy costs, and they added the cost of external financing for the company to that model. External financing reduces the firm’s liquidity reserves and increases the cost of debt. So, they studied the "debt conservatism puzzle" from another point of view and showed that financially constrained companies select to use less debt in their capital structure to conserve their liquidity. They showed that by incorporating the

external financing costs of debt, the classical model for the net tax benefits of debt does not hold, since the realized corporate earnings are separated in time from the payouts to the underlying firm's owners. They offered as an explanation about why the trade-off hypothesis was not supported by their data, the fact that the latter only applies to financially unconstrained companies, while the sample firms were financially constrained with external financing costs and for them, they can adjust their debt policy or their cash/liquidity policy, or both of them.

Miloş (2015: 129–134) for a sample of Romanian companies investigated the determinants of capital structure and found a negative relation between liquidity and leverage. Růčková (2015: 69–79) analyzed the impact of liquidity and other factors on the use of debt in manufacturing companies in V4 Group. The results for four countries were not the same but in most of the cases, including Poland, liquidity influenced the debt ratio in a negative way. Canzoneri et al. (2016: 39–53) developed a theoretical model for public debt management and stated that liquidity demand must be satisfied as well as a constant tax rate must be maintained so that conflicts would not arise. Šeligová (2018: 223–234) focused on the energy sector in the Czech and Slovak Republics for the period of 2007–2015 and determined the impact of funding sources on the firms' liquidity**.** The correlation between debt to equity ratio and liquidity current ratio was found negative in both cases. So, the results indicate that the more liquid the firm is, the less leveraged it is.

Ni et al. (2017: 1158–1169) in his theoretical approach stated that the corporate tax level can also play a significant role in capacity of debt financing. Higher tax rate leads to a bigger tax benefit of debt, it also gives rise to a higher tax liability. The firms balance the tax benefit of debt with the agency cost, to meet the optimal level of debt. On the other hand, Ko and Yoon (2011: 824–855) attempted to determine whether or not, Korean firms failed to fully utilize the tax benefits of debt. These firms' low leverage, however, seems reasonable when the financial distress costs were considered. Waluyo (2018: 331–339) indicated that a company tends to use taxes efficiently by maximizing costs, which can be reduced with income by using debts. He analysed Indonesian market and found that the tax rate from manufacturing companies has a positive coefficient on leverage; it shows that, if the income tax rate is high, the company tends to use taxes efficiently. The efficient use of tax rates is accomplished as a company depreciates the value of its fixed assets; this is done, so that the company does not need to make any more fiscal corrections. The company aims to intensify its capital against the effect of tax rates to be more efficient.

Private companies have a set of strategies to optimize their compliance cost burden and they can be expected to choose cost-optimal decisions, Therefore, based on the results of the above mentioned studies for the countries of Belgium, the USA and the UK as developed economies, and the transition economies of

Romania, Croatia, the Czech and Slovak Republics and Indonesia, we have developed the research questions related to the relationships between costs, taxes, liquidity and indebtedness and the testable hypotheses. Our testable hypotheses try to investigate the relation between corporate costs and corporate taxes, as well as the relation of corporate costs and liquidity, the relation of leverage and corporate taxes and costs and liquidity for the Polish market.

Based on the findings presented in the literature and the goal of this paper that is to present costs and taxes in companies in the light of financial management concepts related to liquidity and capital structure, the hypothesis that there exists a significant relationship between taxes, costs and financial management strategies is tested in the next sections.

2. DATA AND METHODOLOGY

There are 8804 observations related to 419 non-financial companies listed on the Warsaw Stock Exchange taken into consideration for the period of 2012–2018 representing the time between financial (2008–2010) and health crises (2019–to date). The data was collected from the Eikon database. We considered the large- and medium sized companies listed in the main and alternative markets on the WSE. Our initial sample consisted of 807 companies but almost half of them were excluded due to the limited available information regarding their costs and taxes.

The following variables are assessed for the Pearson correlation analysis and for the regression analyses:
CCC = cash conversion cycle;
CR = current ratio;
DE = debt to equity ratio;
CostR = costs of revenue divided by revenues;
CostsSGA = selling, general, administrative expenses divided by revenues;
CostsRD = R&D expenses divided by revenues;
CostsDeprA = depreciation and amortization costs divided by revenues;
TaxProv = provision for taxes divided by revenues;
TaxCur = current taxes divided by revenues;
TaxInc = income tax divided by revenues.

We applied several OLS single regression models as described generally in Equation (1):

$$Y_i = a_0 + a_1 X_1 + e_i \qquad (1)$$

The dependent variables in our various models according to the hypothesis we are testing are as follows: the cash conversion cycle for liquidity *(CCC*), the debt to equity ratio for leverage (*DE*) and three tax variables i.e.: *TaxProv, TaxCur* and *TaxInc*. Taking into consideration different variables as independent that could be affecting our dependent variables considered in this analysis, 26 simple regressions are estimated to detect the influence of costs, taxes and liquidity on various strategies performed by the Polish companies. Wherever necessary, some models were corrected regarding the heteroskedasticity.

In order to answer our research question that there exists a significant relationship between taxes, costs and financial management strategies, we have formulated the following testable hypotheses:

H1: There is expected to be a negative relationship between corporate costs and corporate taxes.
This hypothesis is tested with the correlation and regression models based on the following variables representing costs: *CostR, CostsSGA, CostsRD*, and *CostsDeprA* and the variables representing taxes: *TaxProv, TaxCur* and *TaxInc*. In various regression models, for this hypothesis to be tested, the dependent variable is one of the tax variables in each model and we test how it is affected by each of the costs in single regressions.

H2: There is expected to be a negative relationship between a firm's corporate taxes and costs with the liquidity.
This hypothesis is tested with the correlation and regression models based on the following variables representing taxes: *TaxProv, TaxCur* and *TaxInc*, costs: *CostR, CostsSGA, CostsRD,* and *CostsDeprA* and the following variables representing liquidity: *CR* and *CCC.* In the various regression models for this hypothesis to be tested, the dependent variable is the *CCC*, and the independent variables represent taxes and costs.

H3: There is expected to be a negative relationship between corporate debt and corporate taxes and costs.
This hypothesis is tested with the correlation and regression models based on the following variables representing taxes: *TaxProv, TaxCur* and *TaxInc* and *DE* as a variable representing debt. In various regression models for this hypothesis to be tested, the dependent variable is the debt ratio, and the independent variables represent taxes and costs.

H4: There is expected to be a negative relationship between corporate debt and financial liquidity.
This hypothesis is tested with the correlation analysis based on the following variables representing liquidity: *CR* and *CCC* with *DE* representing the debt ratio. We do not analyse this issue in depth because this issue is not the main subject of this paper. We rather focus on the costs and taxes influencing the debt and liquidity management, but this information can be useful for the interpretation of the results.

3. RESULTS AND ANALYSIS

As a first step, the analysis of the sample descriptive statistics is presented in Table 1.

Table 1. Descriptive statistics, number of observations - 8804

Variable	Mean	Median	S.D.	Min	Max
CCC	-0.0000173	-40.3	0.00000341	-0.000000147	229.00
CR	3.20	1.48	14.6	0.000	802.00
DE	0.297	0.0858	6.33	-350.00	251.00
CostR	2.94	0.753	114.	-252.00	0.000923
CostsSGA	2.79	0.165	51.1	-128.	0.00096
CostsRD	1.29	0.00367	7.08	-0.0380	62.40
CostsDeprA	1.13	0.0172	26.20	-0.747	0.000106
TaxProv	-0.320	0.00844	24.50	-0.000176	482.00
TaxCur	0.0238	0.00819	0.466	-0.101	28.60
TaxInc	-0.444	0.00954	26.40	-0.000176	227.00

Source: own study

Mean values indicate that the selected companies performed an aggressive dynamic liquidity strategy with a negative mean and median level of the cash conversion cycle (*CCC*) and a conservative working capital policy as measured by the current ratio (*CR*). The mean value of the debt to equity ratio (*DE*) indicates how the level of debt on average in the selected companies is taken into consideration.

The Pearson correlation coefficients between the examined tax ratios and costs/expenses variables are presented in Table 2.

Table 2. Pearson correlation coefficients between costs/expenses variables and tax ratios

Correlation	CostR	CostsSGA	CostsRD	CostsDeprA	DE
TaxProv p-value	-0.86 0.0000	-0.39 0.0000	-0.38 0.0001	-0.13 0.0000	0.0002 0.9857
TaxCur p-value	0.0002 0.9882	0.16 0.0000	-0.11 0.3539	0.13 0.0000	0.00001 0.9409
TaxInc p-value	-0.98 0.0000	-0.47 0.0000	-0.04 0.7457	-0.67 0.0000	0.00009 0.9957
DE p-value	-0.0001 0.9912	0.001 0.9076	0.32 0.0051	0.000009 0.9968	

Source: own study

Provision on tax is significantly negatively correlated to costs of revenue, selling expenses, R&D costs, and depreciation. This result is consistent with our first hypothesis. Current taxes are correlated in a positive way with selling expenses and depreciation costs, which is in contrast to our hypothesis. Income tax is negatively correlated with costs of revenue, selling expenses and depreciation costs, which is consistent with our hypothesis. Thus, we observe that in two out of three tax variables, we are investigating the data supporting our hypothesis. Moreover, when investigating the relationship between costs and taxes, it can be observed that the strongest negative correlation is between Income tax and Revenue costs.

Furthermore, the results in Table 2 depict the relationship of leverage and taxes. This relation is positive but not statistically significant so, our results are in contrast to our hypothesis that we were expecting a negative relation between leverage and taxes. However, the existence of no relation between leverage and taxes is in accordance with the studies of Myers (1993) for the US companies, and Lasfer (1995: 265–285) for the UK companies, indicating that leverage is not affected by corporate tax rates for the Polish companies, too, although the latter ones belong to a transition economy. Hence, the issue of being a developed or a transition economy does not matter. In addition, our results are in conflict with the study of DeAngelo and Masulis (1980: 3–81) who found a positive relation of the leverage and the tax rate.

The Pearson correlation coefficients between the selected liquidity ratios and the other examined variables are presented in Table 3.

Table 3. Pearson correlation coefficients between selected variables and liquidity ratios

	CostR	CostsSGA	CostsRD	CostsDeprA	TaxProv	TaxCur	TaxInc	DE
CCC p-value	-0.28 0.0000	-0.27 0.0000	-0.91 0.0000	-0.04 0.1029	-0.20 0.0000	-0.17 0.0000	-0.28 0.0000	-0.001 0.9357
CR p-value	-0.002 0.8800	-0.003 0.8054	-0.03 0.8237	-0.004 0.8405	0.001 0.9055	-0.003 0.8743	0.002 0.8775	0.12 0.0000

Source: own study

The results presented in Table 3 indicate that the dynamic liquidity ratio of the cash conversion cycle (*CCC*) is significantly negatively correlated to various costs and taxes but it is not significantly correlated with the capital structure ratio of debt to equity (*DE*), while the static one, the current ratio (*CR*) is significantly correlated and this relationship is positive.

These results regarding the cash conversion cycle and its negative relation to the taxes and costs confirm our second testable hypothesis. Polish market was not tested before for this kind of relationship between liquidity and tax/costs.

On the other hand, the static liquidity indicator, the current ratio (*CR*) is significantly positively correlated with the debt-to-equity ratio (*DE*), which is the proxy for the firms' capital structure, but is not linearly correlated with the variables of various costs and taxes. Hence, the fourth hypothesis is rejected by our data. This implies that for the Polish companies, their liquidity as measured by the current ratio is positively affected by debt, in contrast to the other transition economies of Romania (Miloş, 2015: 129–134) and Croatia (Šarlija and Harc, 2012: 30–36). On the other hand, our results are in agreement with the studies of Williamson (1988: 567–592), Shleifer and Vishny (1992: 1343–1366) and Anderson (2002: 1–29), which, however, refer to the developed economies. So, we can infer that for the Polish firms, the more liquid they are, the more debt they can afford and have less costs in monitoring their debt. So Polish managers seem to be more efficient in dealing with debt and liquidity management than in the other transition economies.

In the next step, we test which costs and tax variables influence the financial policy of the companies. The regression models with the *CCC* as the dependent variable and taxes and costs as independent variables are assessed according to Equation 1 and the results are presented in Table 4. Seven separate models are tested due to the collinearity of the independent variables.

Table 4. Parameters of OLS Models with the CCC as the dependent variable

Model no	Independent	N	Coefficient	Std. error	t-ratio	p-value	F	p-value (F)
1	CostR *	3906	-947.25	344.05	-2.753	0.0059	7.58	0.0059
2	CostsSGA*	3950	-5203.92	245.91	-21.16	0.0000	447.83	0.0000
3	CostsRD*	70	-28088.70	1719.17	-16.34	0.0000	266.95	0.0000
4	CostsDeprA *	158	-28044.10	4138.96	-6.776	0.0000	45.91	0.0000
5	TaxProv	3960	2443.41	186.8	13.07	0.0000	170.94	0.0000
6	TaxCur	2336	-87101.6	10598.6	-8.289	0.0000	68.70	0.0000
7	TaxInc	2836	2348.80	150.79	15.58	0.0000	242.65	0.0000

*Heteroskedasticity-corrected

Source: own study

All variables and models are significant. In most of the cases the liquidity as measured by the *CCC* is influenced by costs and taxes in a negative way, only the tax variables provision on tax and income tax influence the *CCC* in a positive way.

The regression models with the *DE* as the dependent variable and taxes and costs as independent variables are assessed according to Equation 1, and the results are presented in Table 5. Seven separate models are tested due to the collinearity of the independent variables.

Table 5. Parameters of OLS Models with the DE as the dependent variable

Model no	Independent	N	Coefficient	Std. error	t-ratio	p-value	F	p-value (F)
1	CostR *	4336	-0.00004	0.0002	-0.019	0.9855	0.0002	0.9997
2	CostsSGA*	4384	0.0007	0.007	0.09	0.9855	0.004	0.9954
3	CostsRD*	74	0.03	0.01	2,86	0.0055	4.76	0.0114
4	CostsDeprA *	178	0.0009	0.0008	0.102	0.9184	0.04	0.9573
5	TaxProv	4400	0.0001	0.0006	0.04	0.9668	0.0008	0.9991
6	TaxCur	2570	0.008	0.07	0.12	0.9041	0.16	0.8518
7	TaxInc	3136	0.0001	0.0004	0.03	0.97	0.005	0.9946

*Heteroskedasticity-corrected

Source: own study

Capital structure is influenced in a positive way by the *R&D* costs, and it is the only significant variable in the tested models. This result is according to the study of DeAngelo and Masulis (1980: 3–81).

We look for the answers to the questions regarding factors influencing the taxes in the next step. The regression model with Provision on Taxes as a dependent variable and costs as independent variables are assessed according to Equation 1 and the results are presented in Table 6. Four separate models are tested due to the collinearity of the independent variables.

Table 6. Parameters of OLS Models with TaxProv (provision for taxes divided by revenues) as the dependent variable

Model no	Independent	N	Coefficient	Std. error	t-ratio	p-value	F	p-value (F)
1	CostR	6647	-0.18	0.001	-139.9	0.0000	19581.9	0.0000
2	CostsSGA	6716	-0.24	0.007	-34.45	0.0000	1186.80	0.0000
3	CostsRD	93	-0.01	0.002	-3.97	0.0001	15.76	0.0001
4	CostsDeprA	3073	-0.08	0.01	-7.61	0.0000	57.91	0.0000

*Heteroskedasticity-corrected

Source: own study

All the selected types of costs influence the provision on taxes in a negative way. The explanatory variables in all four models are significant. The level of Provision on taxes is influenced in 74% by the Costs of revenues.

In the next step, the Current Tax as the dependent variable and the selected costs as independent variables, are assessed according to Equation 1 and the results are presented in Table 7. Four separate models are tested due to the collinearity of the independent variables.

Table 7. Parameters of OLS Models with TaxCur representing the Current Tax as the dependent variable

Model no	Independent	N	Coefficient	Std. error	t-ratio	p-value	F	p-value (F)
1	CostR	3727	0.0007	0.000001	0.01	0.98	0.0001	0.9891
2	CostsSGA	3732	0.003	0.0003	20.20	0.0000	102.02	0.0000
3	CostsRD	73	-0.001	0.001	-0.9331	0.3539	0.87	0.3539
4	CostsDeprA	1403	0.12	0.02	4.95	0.0000	24.45	0.0000

*Heteroskedasticity-corrected

Source: own study

Selling expenses and Depreciation are the cost variables that influence the Current Tax variable positively and significantly.

In the next step, Income Tax as the dependent variable and the selected costs as independent variables are assessed according to Equation 1, and the results are

presented in Table 8. Four separate models are tested due to the collinearity of the independent variables.

Table 8. Parameters of OLS Models with TaxInc representing Income Tax as the dependent variable

Model no	Independent	N	Coefficient	Std. error	t-ratio	p-value	F	p-value (F)
1	CostR	4536	-0.19	0.0005	-355.30	0.0000	126149.4	0.0000
2	CostsSGA	4559	-0.29	0.008	-36.00	0.0000	1295.77	0.0000
3	CostsRD	79	-0.004	0.01	-0.32	0.7457	0.10	0.7456
4	CostsDeprA	1694	-0.15	0.004	-36.72	0.0000	1348.27	0.0000

*Heteroskedasticity-corrected

Source: own study

Income tax is influenced by all the costs except the R&D one that is not a significant variable. Hence, we observe that costs strongly and negatively determine the level of Income Taxes.

Therefore, our results have revealed that different types of taxes are influenced differently by the selected types of firm expenses. The variables provision on taxes and Income tax are affected negatively by the costs we have determined, while current tax is positively influenced by the selling expenses and depreciation.

CONCLUSIONS

There is a general rule that if a firm wants to avoid paying taxes, and it is its goal, it presents a lot of costs (direct, administrative costs and R&D costs which promote growth) and then, as a result excessive costs lower earnings and less taxes are due. We were looking for the answer to the research question whether there is any relationship between the level of taxes and costs with the company's liquidity and leverage representing the financial strategy a company follows. A company with high costs reports low EBT which implies less taxes. So, there is expected to be a negative relationship between corporate costs and corporate taxes. In most of the cases there was a negative relationship between corporate costs and corporate taxes found in our research, according to our hypotheses. Only the Current Tax was affected positively by the selling expenses and depreciation. Growing expenses including depreciation, did not reduce taxes. The effect could be offset by a less efficient debt management (the average debt to equity ratio was only 0.297). The relation between corporate costs and taxes with liquidity was negative as expected, only the CCC was influenced by tax provisions and income tax in a positive way. The efficiency of the cash conversion as reported by CCC is positively

influenced by taxes, and it can be concluded that the higher taxes a company pays, the higher the CCC, so the lower the liquidity (a dynamic liquidity). Contrary to our hypotheses, corporate taxes and expenses and debt were related mostly in a positive way. Only the cost of revenue and debt were negatively correlated. The debt of Polish enterprises is small and when it rises, it is spent on expenses in order to reduce the amount of taxes paid. Debt and liquidity as measured by the current ratio were related in a positive way, the correlation with the CCC was negative but not significant. Probably companies that increase their debt want to achieve a better solvency level. In these results one can clearly observe the fear of getting into debt.

Mocanu et al. (2021) found that larger companies with lower financial performance and a lower leverage ratio are more inclined towards tax avoidance. The geographical region and the industry sector in which companies operate in, are also determining their tax avoidant-behavior. Taking into consideration our findings the future research can cover the issue of differences regarding costs and tax approaches between countries with a different level of tax avoidance acceptance.

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CRYPTOCURRENCY MARKET AND TAX REGULATIONS IN TURKEY: AN ANALYSIS IN THE EUROPEAN EMERGING ECONOMY

Burcu Zengin* **Sahnaz Kocoglu****

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CRYPTOCURRENCY MARKET AND TAX REGULATIONS IN TURKEY: AN ANALYSIS IN THE EUROPEAN EMERGING ECONOMY

Abstract

The aim of the article: The purpose of this study is to provide a thorough review of the current state of cryptocurrency market and how governments perceive and deal with the threats and opportunities brought by the block chain technology. Cryptocurrencies were certainly the most popular investment in the last decade with a skyrocketing trading volume. However, cryptocurrency abilities in money laundering, financing terrorism and tax evasion overshadow the great opportunities and potential of this new technology. Therefore, the major economies in the world have been working on an efficient and effective strategy to control and tax the cryptocurrency market. In this study, the current state in Turkey regarding cryptocurrency taxation is analysed and a tax system is proposed. The authors claim that the Tobin tax, or in other words, low tax rates would be the best tax system to be applied in Turkey.

Methodology: The study is based on a detailed literature review on the subject, academic papers, news releases and legal acts of the USA, Europe and Turkey. Different attitudes of varied groups are discussed and proposed solutions in the subject are being considered.

Results of the research: Cryptocurrency market has a great potential and block-chain technology is full of opportunities. However, it is essential to control this market without harming the appeal of cryptocurrencies, yet this is not an easy task. Therefore, we argue that Turkey should extend the usage of cryptocurrencies, create a tax strategy with low tax rates and we claim that a regulation similar to the Tobin tax application would be effective here.

Keywords: cryptocurrency, bitcoin taxation, tax law, Turkish law.

JEL Class: K34, G15 G28.

* Research Assistant, Ph.D., Faculty of Economics and Administrative Sciences, Department of Business Administration, Ankara Hacı Bayram Veli University Turkey, e-mail: burcu.zengin@hbv.edu.tr, https://orcid.org/0000-0001-5275-6748
** Assistant Professor, Ph.D., Faculty of Economics and Administrative Sciences, Department of Business Administration, Ankara Hacı Bayram Veli University Turkey, e-mail: sahnaz.kocoglu@hbv.edu.tr, https://orcid.org/0000-0002-2061-1242

INTRODUCTION

The development in decentralized finance applications has also diversified and increased the applications of cryptocurrencies, which have a great place in this system. The growth of this ecosystem has increased the interest in cryptocurrencies and has provided advantages in achieving the main purposes of the financial system such as making payments, financing, and investing. Compared to the traditional financial system, the advantages of this new one, such as high speed and low cost, are expected to provide financial inclusion by reducing the factors that make it difficult to gain access to financial services.

Decentralized financial services aim to perform the functions of the traditional financial system in an open, decentralized, autonomous way based on blockchain, thereby increasing the efficiency of these transactions. DeFi applications have a potential to expand financial inclusion, promote innovation and create new opportunities for entrepreneurs and innovators (Chen and Bellavitis, 2020: 2; OECD, 2022: 3). With the technological innovations they provide, cryptocurrencies have advantages such as high transaction speed, low cost, and security of transaction information, unlike traditional systems (Gowda and Chakravorty, 2021: 530). However, DeFi applications also have destabilizing effects such as high volatility, liquidity mismatches, openness to market manipulations, risk of illegal financing, and lack of transparency (Aramonte et al., 2021: 21; OECD, 2022: 3). One of the most important applications in this decentralized financial system, which is exempt from public regulations and is processed anonymously, is cryptocurrency applications. Despite the fact that cryptocurrencies are the most popular technology trend in the world, their possible adverse impacts, such as huge carbon emissions produced during mining (Stoll, Klaaßen and Gallersdörfer, 2019) or usage for illegal activities due to their anonymous nature are recently recognized problems. Today, the number of people using cryptocurrencies for tax avoidance is also striking. Unlike other financial transactions, the absence of tax regulations in these transactions causes that these systems create a competitive advantage. This disadvantageous situation in traditional financial systems leads to the use of decentralized financial systems, mainly as tax shelters. The intensity of the struggle of states against traditional tax havens (Şahin, 2019: 177) also increases the demand for the decentralized financial system led by cryptocurrencies. Although it is difficult for these transactions to be subject to tax regulations due to their unique characteristics, all states should regulate them with tax law.

In the future, it is expected that this system will expand, diversify, and replace the traditional financial system at certain points. However, for this to happen, the cryptocurrency system needs to be regulated and the investor and the system itself

must be protected. Regulations made with a "prohibitive mindset" will cause cryptocurrencies to flee to countries where such regulations do not exist, and countries will have a competitive advantage unless there is an international agreement. For this reason, it is important that the introduced regulations are regulatory instead of prohibiting the system.

Cryptocurrency regulations in Turkey should also be examined in this context. The increasing interest in cryptocurrencies in Turkey in recent years has made these regulations mandatory. In order to protect the investor and the system, one of the changes expected to be made in 2022 is the taxation of cryptocurrencies. The protective regulations expected to be made in this area and the tax regulations expected to be formed within the framework of the Turkish Tax Law have been evaluated in the study. Changes and exceptions that may occur in tax rates with the change in the nature of cryptocurrencies are mentioned within the scope of the study. It is hoped that this evaluation can help overcome the problems that may be experienced during the regulation of cryptocurrency applications that create a new financial ecosystem.

The purpose of this paper is to analyze the current situation in the crypto market and crypto taxation as well as to propose a system for Turkey. Firstly, the cryptocurrencies and how they work in the financial system is explained and then, the issue concerning how the big economies tax cryptocurrencies is summarized. The authors of article analyzed the market in Turkey, Turkish tax system and we proposed a system indicating how the cryptocurrencies should be taxed in Turkey. The authors suggest that low tax rates should be very effective, both to generate tax revenue for the government and to prevent a possible damage in the crypto market. The authors of article aim to propose the most effective tax system for the crypto market in Turkey and firstly this requires a detailed analysis of the current situation in the world and particularly in Turkey.

1. THE CRYPTO MARKET AND CRYPTOCURRENCY TAXATION

1.1. Concept of cryptocurrency

Cryptocurrency is the most popular tech trend with more than $2 trillion market capitalization by April 2021 whereas the only country in the world which has made Bitcoin legal tender is El Salvador since its inception in 2009. Bitcoin was originally defined as a decentralized intangible currency based on peer-to-peer networking although it is neither like gold with high intrinsic value nor a traditional currency issued by a central authority. This identity crises of cryptocurrencies have initiated the discussion on whether cryptocurrencies are taxable or not.

After the collapse of the major financial institutions in 2008 crisis, investors lost confidence in the traditional financial system and chose to trust the technology

infrastructure (Wątorek et al, 2021). Cryptocurrencies offered an alternative to the centralized banking system after the 2008 turmoil and the first crypto exchanges such as Mt. Gox and Bitcoinmarket.com were launched in 2010. Since then, hundreds of different cryptocurrency platforms have been launched such as Binance, CoinFLEX, OKX, Upbit and Deepcoin. Crypto Market Sizing Report (2022) released by Crypto.com forecasts that the number cryptocurrency owners will be around 1 billion by the end of 2022. That may be a bit surprising because there are only a handful of companies accepting the cryptocurrency as payment.

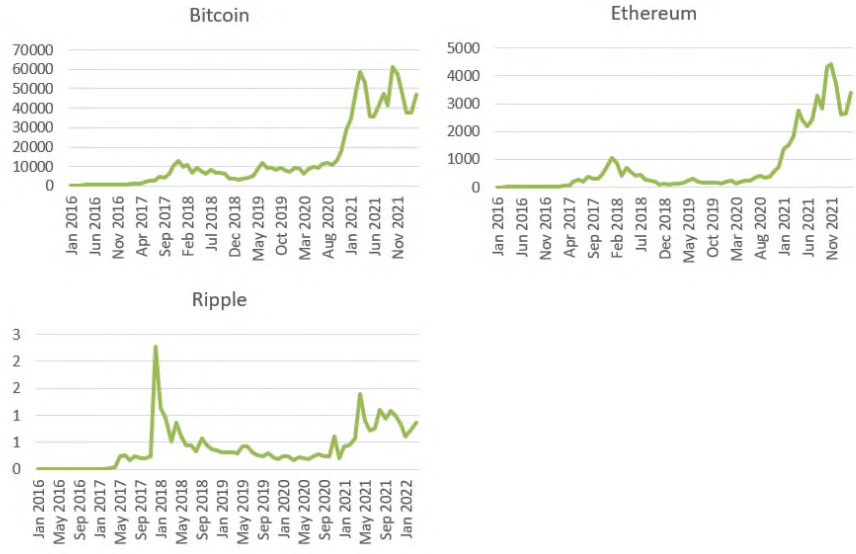

Chart 1. The historical prices of Bitcoin, Ethereum and Ripple

Source: CoinGecko and Statista.

Chart 1 shows the price change in the major cryptocurrencies: Bitcoin, Ethereum and Ripple since 2016. In the past decade, the cryptocurrencies have given the investors an excellent return of more than 1000%, even beyond the expectations of their original investors. Yermack (2015) emphasizes this characteristic of cryptocurrencies and argues that with such great volatility, Bitcoin should be categorized as a speculative investment. Being a new asset class and investment instrument (Haiss, Schmid-Schmidsfelden, 2018), cryptocurrencies created a new market and very well-known crypto billionaires have made fortunes in this market. Millions of dollars returns raised the problem that its investors should be taxed as ordinary stock or commodity holders while this is definitely not an easy task.

1.2. Taxation of cryptocurrencies

The problem how cryptocurrencies should be taxed presents a major challenge for the authorities as their nature complicates the issue. Cryptocurrencies are all digital, traded globally, not issued by a central bank and not stored by traditional banks and thus, these characteristics make them very hard to control and follow. Cryptocurrencies have emerged as new tools for money laundering (Dupuis and Gleason, 2020), financing terrorism (Choo, 2015) and tax evasion (Slattery, 2014). Although the crypto market is still so small, Marian (2013) argues that cryptocurrencies have the potential as a useful tool for tax evasion. Due to these real-life problems of virtual currencies, cryptocurrency taxation has attracted immense attention in the literature to propose solutions and a tax strategy for specific countries. Countries like the UK, Canada and the USA classify Bitcoin as a property and tax cryptocurrencies accordingly whereas Gamble (2017) argues that traditional ways for taxation of such a complex instrument would be a vain effort. In the next section, the authors try to summarize the taxation policies in the major economies and the experiences and criticism related to their strategies.

1.2.1. Taxation of cryptocurrency in the USA

In spite of the fact that Bitcoin was designed as a currency, due to immense interest by the investors, in 2014 the Internal Revenue Service of the United States of America (IRS), classified cryptocurrencies as property and declared that they should be taxed accordingly. Wiseman (2016) finds this ruling wrong for some reasons. Firstly, he states that this type of taxation will favor the long-term investors rather than daily users, as keeping daily record of transactions, daily losses and gains will create an immense burden for them. This complication would encourage the Bitcoin holders to use it as an investment but not for daily sale and purchases. Moreover, he states that the security and the anonymity of cryptocurrency offer makes the transactions untraceable for the IRS. Therefore, the system brought by the IRS is based on voluntary disclosure in practice and Sanchez (2017) argues that the system so far has failed to stop using cryptocurrencies for tax evasion purposes. Charging VAT on the cryptocurrencies is not an option for the USA but each state has the sole authority over imposing VAT (Ram, 2018). Therefore, the IRS which is responsible for nationwide taxation cannot enforce VAT on the crypto market.

Since blockchain offers infinite opportunities and is a constantly evolving technology, new instruments and applications which require new tax treatment come to market as well. Therefore, the IRS should update the tax system for crypto assets regularly to clear the fog in the market. One example is coin hard fork which is much like stock split. In 2017 Bitcoin had hard fork in which a new and separate currency called Bitcoin Cash emerged. Everyone having Bitcoin before the hard

fork got the same amount of Bitcoin Cash in 2017. Lerer (2019) states that the IRS has not clarified how hard fork should be reported by the taxpayers and the debate over this issue is still going on. It is true that the USA is one of the pioneering countries in the world regarding the Bitcoin taxation, but there are still many traps along the way and the system should be updated regularly.

1.2.2. Taxation of cryptocurrency in Europe

The European Court of Justice ruled the exemption of Bitcoin from VAT when it is being exchanged for traditional currency in Hedqvist Case in October 2015. Solodan (2019) states that this ruling categorized the Bitcoin as a traditional currency, but the attitude of other EU institutions differs. The European Central Bank labels the Bitcoin as an asset and has a clear negative attitude towards Bitcoin. The ECB (2021) argues that Bitcoin is not to be trusted, a slow and an expensive payment instrument, a very volatile asset and it fails to offer protection for users. To bring a harmonized legal framework among the member states, the European Parliament adapted regulation on Markets in Crypto assets (MiCA). Despite the efforts of the EU Commission and Parliament, in the EU there is no unified approach against cryptocurrencies, and it is still up to member states to regulate the crypto assets. Chart 2 summarizes the regulation of cryptocurrencies across Europe.

Chart 2. Taxation of crypto currencies around Europe

Source: Based on the information provided by the Law Library of Congress, Global Legal Research Directorate (2021) Regulation of Cryptocurrency Around the World: November 2021 Update.

Although most of the European countries have already attempted to regulate and tax the cryptocurrencies: Germany, the Netherlands, Austria, Spain, Italy, Greece, Cyprus and Turkey impose no VAT on the Bitcoin. Global Legal Research Directorate (2021) report states that Bulgaria and Moldova do not apply any tax law and classify the status of Belgium regarding the application of tax law as ambiguous. Houben and Snyers (2018) state that regulating the cryptocurrencies at the EU level is better than permitting each member state to enforce law at a national level. Moreover, they argue that regulating the cryptocurrencies at an international level is actually the best way to fight with tax evasion.

1.2.3. Proposed solutions

Marian (2013) suggests that regulating the intermediaries is a possible way. The intermediaries collect some information of the users like a bank account. Whenever the coin is exchanged for real currency, the tax authorities might intervene and demand income tax from the users. However, Marian (2013) states that this way of taxation works only when the users exchange the crypto for real currency. There are other more radical approaches such as purchasing all Bitcoins by the central banks or forbidding using Bitcoin for payments, but Marian (2013) states that this would harm the Bitcoin market deeply which favors nobody at the current state. Instead of putting more limitation on the market to avoid tax evasion, Sanchez (2017) argues that recognizing Bitcoin as legal tender would solve the problem as the national regulations regarding currencies would be simply applied. Moreover, Wiseman (2016) states that classification of cryptos as currency would also benefit the users by avoiding reporting the burden and encourage the wide usage of cryptocurrencies. However, considering Bitcoin as legal tender does not offer solution to the question how mining or creating cryptocurrencies should be taxed. As suggested by Akins, Chapman and Gordon (2014) mining Bitcoin is similar to earning income in exchange of goods or services and thus income generated should be reported for tax purposes accordingly.

2. CRYPTOCURRENCY TAXATION IN TURKEY

2.1 Current Situation in Turkey and Turkey's Potential

The spread of cryptocurrencies in Turkey started with the sudden price increase in the unit price of Bitcoin in 2017 (ICTA, 2020: 21). According to the "Crypto Asset Report" prepared by the Central Bank in 2021, there are 40 cryptocurrency platforms and a transaction volume of 28 billion TL in Turkey (NTV, 2022a). These numbers are only estimations based on the transaction volumes of Turkey based trading platforms (Paribu 11.1; BTCTürk 7.6; Paritex 4.2 billion TL) which share data while transaction data on global platforms cannot be accessed. The report also emphasizes that cryptocurrencies have no intrinsic value, and their values are very volatile. Additionally, it states that it is not possible to use these coins as an account value unit or a medium of exchange. The report focuses on the disadvantages of crypto assets. Risks of cryptocurrencies were listed in the report as: (i) inadequate supervision; (ii) price risk due to extreme volatility in the market; (iii) usage in illegal activities due to their anonymity; (iv) difficulty in avoiding tax evasion; (v) wallet theft; (vi) vulnerability to cyber-attacks; (vii) irreversible transactions; (viii) no legal protection; (ix) sustainability problems as it is still not a globally accepted payment instrument; (x) global warming due to high electricity consumption (Bloomberght, 2021a).

In order to evaluate Turkey's position in the cryptocurrency market, it is necessary to look at its place in the international arena. In this context, according to Statista's Research in 2021 shared by the World Economic Forum; Turkey ranks fourth in the world after Nigeria, Vietnam, and the Philippines and first in Europe in the cryptocurrency market with regard to a number of users (WEF, 2021).

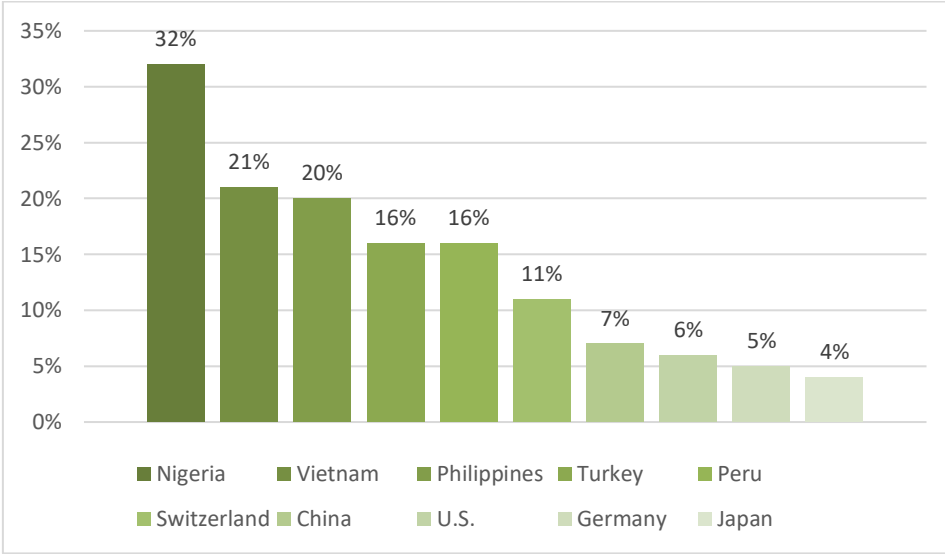

Chart 3. Share of respondents who said that they used or owned cryptocurrency

Source: Statista (2021).

According to the research conducted by Paribu, a cryptocurrency trading platform, in Turkey in 2021, the rate of those who heard of cryptocurrency raised to 69.9% with 54 points increase from 2020 to 2021, while the rate of those who traded doubled compared to the previous year and reached 11%. The report shows that 28.7% of the investors consider the cryptocurrency market as profitable. While the rate of those who have traded in cryptocurrency in Turkey was 0.7% in 2020, this rate increased to 7.7% in 2021 (Paribu, 2021: 1–3). The surge in the number of users and transaction volume of cryptocurrencies, the change in the investor's risk perception towards the crypto market as well as the high return expectations indicate how big their potential is in Turkey and similarly, in the rest of the world.

2.2 Legal Structure in Turkey

The first official statement regarding cryptocurrencies is given by the Banking Regulation and Supervison of Agency of Turkey in 2013. They declared that since cryptocurrencies are not issued by any official or private institution and no guarantee is given for their return, it cannot be considered as electronic money within

the scope of the law and therefore its supervision and control is not possible (BRSA, 2013).

Capital Markets Board of Turkey, which prepared a booklet on cryptocurrencies in 2016, focused on the risks that may arise and stated that digital money supply (ICO) activities are outside the scope of control (CMB, 2018).

With the regulation published in April 2021, the Central Bank has decided that crypto assets cannot be used directly or indirectly in payments and that payment and electronic money institutions cannot intermediate fund transfers to crypto asset platforms. After this arrangement, the transfer of funds via traditional banks continued.

The report by the Turkish Grand National Assembly on cryptocurrencies explained the attitudes of other countries towards cryptocurrencies and stated that the market size increased to $3 trillion (2022) from $14 billion (2016), and that crypto assets are used as medium of exchange in many areas from tourism to education and art dealing. With the technological developments, cryptocurrencies are evolving and create a new financial ecosystem. To be a part of this financial system and have a competitive advantage in the international arena, countries take various initiatives. On the one hand, many countries are still cautious about the risks in the market, on the other hand, efforts are made not to stay out of this new financial order. At this point, it is possible to talk about digital currencies that Central Banks are working on. The Digital Euro of the European Central Bank, the Digital Yuan of the Central Bank of China and finally the Digital Dollar of the US Federal Reserve are in the agenda of these economies to take advantage of the opportunities in this financial system.

Turkey has also made an attempt to catch up with new advancements in the crypto market. In this framework, research on the Digital Turkish Lira circulation is carried out in cooperation with the Central Bank, Aselsan, Havelsan and Tübitak, and it is planned to be put into practice in 2022 (Bloomberght, 2021b)

There are also developments in the regulation of cryptocurrencies. With the regulation expected to be issued in 2022, it was emphasized that the capital of the platforms that organize the buying and selling of crypto assets should not be below a certain limit that these companies should be transparently audited by becoming financial institutions, and that the investor should be protected and taxed (Dünya, 2022; NTV, 2022b).

2.3 Taxation of cryptocurrencies in the Turkish legal system

It is an important principle in the Turkish legal system that the state uses its taxation authority in a way that respects fundamental rights and freedoms within the

framework of the law. This principle should also be used during the taxation of cryptocurrencies. The property right, which is protected in Article 35 of the Constitution, can only be limited by reference to the public interest, and the public interest is referred in case of taxation of cryptocurrencies. Taxing cryptocurrencies will raise tax revenue and will bring control to the market by limiting the anonymity of crypto currencies. This will lead to public benefits such as the protection of small investors, the creation of an efficient and safe market, and the prevention of financing illegal transactions. At this point, it should be noted that the property rights of individuals should not be unreasonably and unauthorizedly restricted during the taxation of cryptocurrencies. It is believed that taxation, interference with people's right to use cryptocurrencies should be regulated by law, by authorized persons and in moderation.

Another principle concerns the taxation of illegal activities. According to the Article 9 of the Tax Procedure Law, although the taxable event is prohibited by law, tax burden is imposed. It is common knowledge that cryptocurrencies are also used for some illegal activities by taking advantage of their anonymity. Income earned from these transactions must also be taxed like other legal transactions. Another principle that must be followed during the taxation of cryptocurrencies is that the legal regulations should be clear in order to prevent arbitrariness in taxation, and that the taxable event should be clearly stated in the law. Additionally, the taxpayers should clearly know their rights and obligations. Due to different functions of cryptocurrencies, there is currently no clear expression of the taxable event or standardized regulations of the countries. In this framework, it is sufficient for crypto assets to have an economic function. The acceptance of cryptocurrencies, which perform an economic function, as a store of value or as a medium of exchange does not change the taxation requirement. Currently there is no unified approach to cryptocurrency taxation in the world. However, for the effectiveness of tax laws to regulate and control these currencies, the laws should be consistent in the international arena (IMF, 2016: 30).

Although tax regulations reduce the transaction volumes and future growth potential of cryptocurrencies, taxation is essential considering the negative effects of tax exemption of these economic units. Instead of rates that will reduce the attractiveness of cryptocurrencies, regulations should be introduced in such a way that a small rate of taxation is included so that countries can control these economic transactions and are not devoid of tax revenues. At this point, it should be ensured that both tax revenue is collected, and the competitive disadvantage on the other economic units is eliminated due to non-taxation with a low tax rate such as the Tobin tax. It provides protection from speculative capital flows. In order to prepare tax regulations, first of all, it is necessary to understand the transactions in the new financial order created by cryptocurrency. Today, although it is mainly

used for investment, speculation, and arbitrage rather than use in the real economy (Aramonte et al., 2021: 32), cryptocurrency transactions change every day, and different types of revenues arise as a result. Income is generated as a result of transactions, such as cryptocurrency mining, earning commission income by intermediating their purchase and sale, making profit by changes in price, making payments by buying commercial goods/services, making profit from price difference that will occur by taking advantage of the initial public offering of cryptocurrencies (Serçemeli, 2018: 50). The tax regulations to be applied during the taxation of these incomes vary according to the nature of cryptocurrencies. If these coins are accepted as currency, commodities, intangible rights or securities (Sarıkaya, 2020: 61), the regulations will differ accordingly. For fair and effective tax regulations, it is necessary to determine the taxpayer, the type of income, the place where the taxable event occurs, the tax base, and the tax regime to be applied (Kaya and Akçay, 2017: 61). However, this process is not as easy as it seems. International institutions have different views on this issue. For this reason, within the scope of the study, the views of international institutions on the subject will be mentioned, and the regulations that should be made within the framework of the Turkish Tax Law will be evaluated.

2.4 Identity of cryptocurrencies

Due to its ever-changing features, it is getting harder and harder to fit cryptocurrencies into the traditional financial system. However, in the context of tax law, the clear determination of this nature is a necessity in accordance with "the principle of legality of taxes".

The 2018 report of the European Parliament emphasized that digital currencies such as Bitcoin exhibit the characteristics of securities and are somewhere between money/currency alternatives, credit/finance alternatives and payment/exchange alternatives. In the report that touched upon the difficulty of adapting this complex definition to traditional regulations, the parliament comments that digital money differs from “currency”, on the grounds that it is issued by a private institution instead of a central institution. It is not defined as legal tender, and is created, transferred, and stored digitally. It has been argued that some digital currencies (such as Bitcoin) act similarly to commodities because of the limited supply and resemblance to commodity-based monetary systems, like the gold standard. It was stated that the physical reality of the commodity was replaced by virtual reality in digital money (European Parliament, 2018: 10). The barriers to accepting digital money, which is defined as a kind of decentralized private money by the European Central Bank, as currency are listed. Accordingly, it was emphasized that it is used as a payment instrument to a limited extent. It is accepted by a limited number of merchants, and the number of transactions is insufficient. It was

also stressed that it is not generally used for government payments or as a store of value due to the incredible volatility in prices (ECB, 2019: 3–9).

Cryptocurrencies are considered to be commodities by the U.S. Commodity Futures Trading Commission (CFTC). In the report published by the CFTC, risks such as the uncontrolled virtual currency market, the absence of platforms that protect the consumer from adverse situations like market manipulation, the extreme price volatility, the disadvantaged consumers due to platforms trading from their own accounts were emphasized (CFTC, 2019: 2). The U.S. Securities and Exchanges Commission (SEC), on the other hand, considers cryptocurrencies as securities. The SEC claims that for a digital asset to be identified as a security, it must meet three criteria, called the Howey Test. According to the Howey Test, financial assets that meet the criteria of: (i) investing money (ii) in a joint venture (iii) with a reasonable expectation of profit from the efforts of others are securities. The SEC bases its view on the existence of a startup that raises income through the sale of cryptocurrency coins and tokens, and an investor expecting to profit from that venture. There are lawsuits filed by the SEC against many cryptocurrency initiatives on the grounds that they are not registered as securities. While the lawsuit against the digital token called Kin has been won, the lawsuits against BlockFi and Ripple continue (Reuters, 2022). Today, the SEC has changed its view, and in its latest statements, it stated that there are both crypto commodity tokens and crypto security tokens. For this reason, there is a prevailing opinion that working with the CFTC and meeting on common ground will be beneficial to protect investors and entrepreneurs (SEC, 2022). It is thought that in the future, a consensus should be reached on this issue and regulations should be made accordingly.

Contrary to these views, the IFRS defines cryptocurrency as an intangible asset. In its report published in 2019, the IFRS stated that cryptocurrency should be considered within the scope of IAS 38 because: (i) it can be separated from its owner, sold, or transferred separately, (ii) does not give the holder the right to receive a fixed or determinable number of currencies. However, the IFRS has set an exception based on IAS 2 and emphasized that if cryptocurrencies are held for sale in the normal course of business, they should be considered inventory (IFRS, 2019: 3).

Institutions in Turkey also have different views on the nature of cryptocurrencies. The Ministry of Finance does not have a clear explanation of how cryptocurrency should be defined. However, the decision of the Revenue Administration that cryptocurrency can be inherited, and it should be taxed, and the decision of the enforcement offices that Bitcoin can be seized is interpreted as that the Ministry of Finance is actually recognizing cryptocurrency (HaberTürk, 2021).

The Capital Market Board of Turkey (CMB) specifically states that Bitcoin is not a security, as it does not comply with the rule that a security must be backed by an asset. On the other hand, the Central Bank of the Republic of Turkey is of the opinion that it cannot be accepted as currency since it is not issued by a central authority (Bloomberght, 2017). However, these definitions explain crypto assets through what they are not, rather than what they are, and emphasize the features they do not show instead of a precise qualification. In the Regulation published by the Central Bank in April 2021, crypto assets are defined as “intangible assets created virtually using either distributed ledger technology or a similar technology and distributed across digital networks which shall not in any manner be qualified as fiat money, cash, digital cash, instrument, security, or other capital market instruments" (CBRT, 2021). According to this definition, for the first time in Turkey, crypto assets are defined based on the features they have instead of a definition that emphasizes the features they do not own.

It is expected that the regulations, which will include tax regulations, will be issued in 2022. It is believed that these regulations will be based on the opinion that emerged as a result of the joint work of the Banking Regulation and Supervision Agency (BRSA), the Capital Market Board (CMB), the Central Bank of the Republic of Turkey (CBRT) and the Ministry of Finance. Within the scope of this study, it has been evaluated how this regulation will differ according to the definition of cryptocurrency mentioned in the Regulation.

2.4.1 Valuation and taxation of cryptocurrency as a currency

Money/currency should have functions such as accumulating value, being a unit of account, and being a medium of exchange. Cryptocurrency, as a virtual currency, fulfills these functions. However, in order to find a place for itself as a "currency" in the Turkish Tax Law, it is expected to meet certain conditions determined by law. According to Decree No. 32 on the Protection the Value of Turkish Currency: “Turkish currency means the money in circulation in Turkey according to the law of the Republic of Turkey or which has not expired even if it has been withdrawn from circulation”. In the same Decree: "Any kind of accounts, documents, and instruments that provide payment in foreign currency, including the effective" are defined as foreign currency[1].

Since cryptocurrencies are not issued pursuant to the laws of the Republic of Turkey and there is no currency of another foreign country, they are not considered as money or foreign currency according to Turkish legislation (Sarıkaya, 2020: 62). Although it is unlikely, the taxation procedure should be determined if it is defined as “currency” in the new regulation. Accordingly, when it is accepted as

[1] Decision No. 89/14391 on Protecting the Value of Turkish Currency

a “currency”, it will not be subject to any taxation in terms of income tax since it falls within the jurisdiction of the Central Bank (Günay and Kargı, 2018: 71). In the current situation, there is “no tax” on individuals buying and selling foreign currency. Cryptocurrencies will be treated in the same way. However, this is the case for those who trade without a commercial organization. It will be taxed as “commercial income” for those who regularly buy and sell within the scope of a commercial organization. From the point of view of corporate tax, the exchange rate differences that occur during the purchase and sale should be taken into account in the determination of “corporate income and taxes”. As it is accepted as currency, the trading of cryptocurrencies does not constitute any value-added tax (VAT) base.

When the transactions made by the miners are analyzed from the point of view of the Turkish Tax Legislation, the income generated as a result of these transactions is classified as “commercial income”. Since cryptocurrency mining is an activity that requires hardware with strong processing power and is capital and labor-intensive (Türkyılmaz, 2018: 8), it should be taxed as "commercial income" within the scope of Article 37 of the Income Tax Law (ITL). In terms of Corporation Income Tax, if the miners work as a corporate entity, then the revenue is expected to be taxed within the scope of “corporate income from commercial income”.

Commercial income arising from the transactions of cryptocurrencies on online exchange platforms falls within the scope of “commercial income”. However, if these platforms are established within the corporation, commission income is taxed as “corporate income” according to Article 1 of Corporate Tax (CT).

2.4.2 Valuation and taxation of cryptocurrency as a commodity

The concept of commodities, which means economic assets available for sale (Kaplan, 2007: 30), is also considered to define crypto assets. When crypto assets are regarded as commodities, it is important whether the activity is a continuous and commercial activity as in other definitions during taxation. During buying and selling of cryptocurrencies, earnings from non-commercial transactions of real persons should be counted among the “accidental income” mentioned in Article 82 of the ITL. A certain part of the accidental income is exempted from income tax each year. This figure has been determined as TL 58,000 for 2022. For this reason, the tax will not be charged on the earnings up to TL 58,000 (for the year 2022) of people who are engaged in the trading of crypto assets and whose activities are not continuous (Income Tax General Notification, 2021). In addition, since there is no continuity in these transactions, VAT is not collected. However, if the activity is within the scope of commercial activity and there is a continuity, it will be taxed as “commercial income”, based on the statement in the Article 39 of the Income Tax Law that "the income arising from the purchase and sale of

commodities will be commercial income". At this point, VAT is charged for continuity reasons. Considering the situation in terms of corporations, it is seen that earnings during trading will be subject to corporate tax within the scope of "corporate income arising from commercial income". When cryptocurrencies, which are considered as commodities, are used in mining, it is considered as “commercial income” in terms of miners' income and disposal of cryptocurrency. At this point, it is thought that there will be confusion concerning VAT. Taking into account that miners both receive commodities in return for service and deliver goods, these two transactions will be subject to VAT separately. In addition, the place where the intangible cryptocurrency is delivered and the person who makes the transactions is not clearly known due to the fact that many transfers are made at once with blockchain technology (Türkyılmaz, 2018: 8; Girgin, 2020: 74). Therefore, there is a need for detailed regulations regarding VAT to be collected from transactions. When these transactions are done institutionally, there is a relatively less complex situation. Accordingly, corporations will be taxed within the scope of VAT.

The characterization of cryptocurrencies as commodities will not change the scope of online exchange activities on cryptocurrency exchanges. In this framework, earnings from transactions will be handled within the scope of ITL as “commercial income” for real persons, and within the scope of CT as “corporate income” for corporations.

2.4.3 Valuation and taxation of cryptocurrency as security

Although the CMB has a negative opinion regarding the consideration of cryptocurrency as security, it is still an option for the government. According to the Capital Markets Law No. 2499, securities are defined as “Negotiable instruments which, represent a share or participation in the property of the issuer or an obligation of the issuer, represent a specified quantity of money, are of a series of instruments of the same nature, have the same wording, are dealt in as a medium for investment, are fungible, earn periodic income and have the terms and conditions determined by the CMB”.

Gains of real persons as a result of non-commercial, non-continuous cryptocurrency trading activities will be taxed as “value appreciation income” within the scope of Article 80 of the ITL. Since the exceptions in the law are not applied to securities, it is of the opinion that they should not be applied to cryptocurrencies as well (Ünalan, 2019: 123). Earnings from cryptocurrencies within the scope of a commercial organization will be considered within the scope of "commercial income". From the point of view of VAT, it should be taken into account that the subject of VAT is the delivery and services made within the framework of commercial, industrial, agricultural, and professional activities. Accordingly, VAT is

not subject to taxation and is not taxed during the trading of cryptocurrencies, which are securities. When evaluated in terms of corporations, it is thought that taxation will be required within the scope of "corporate income from commercial income".

In terms of mining operations, cryptocurrencies that are qualified as securities are expected to be regarded as “commercial income” and taxed. Likewise, it is thought that online exchange platforms that generate income through intermediary transactions will incur income tax within the scope of “commercial income” or corporate tax within the scope of “corporate income arising from commercial income”. This varies depending on whether the tax officer who mediates the taxable event and earns commission income is an individual or corporate entity.

2.4.4 Valuation and taxation of cryptocurrency as intangible rights

In the General Communiqué No 1 on Disguised Profit Distribution by Way of Transfer Pricing, commercial intangible rights are defined as "patents, know-how, designs and models used in the production of a good or the provision of a service and transferred to customers or used in the operation of commercial activity (computer software programs) intangible rights that have the character of commercial assets". There is an opinion that cryptocurrencies can be considered as an intangible right because they are computer software and are subject to purchase and sale (Çelen, 2018: 160).

When cryptocurrencies are considered as intangibles, trading profits will be taxed as “commercial income” in cases where trading activity continues. It is also considered that VAT will be collected within the scope of VAT Article 10. In case the transactions are made individually, not commercially, the scope of tax will vary depending on whether the purchase and sale is one-time or leased. Accordingly, the earnings of real persons from one-time purchase and sale differences will be taxed within the scope of "accidental income" mentioned in Article 80 of the Income Tax Law. In case of renting, it is expected to be considered within the scope of "real property income" in Article 70 of the Income Tax Law (Sarıkaya, 2020: 74; Ünalan, 2019: 125). When viewed on a corporate basis, it should be considered within the framework of "corporate income from commercial income" and the corporate tax should be calculated accordingly.

If miners operate corporately, taxation will be made on “corporate income”. Conversely, if they operate individually, they are considered to be able to benefit from the copyright exemption within the scope of “self-employment income”, as they are seen as the creator of intangible rights. In these cases where self-employment income occurs, it is foreseen that they can benefit from the copyright exemption if it does not exceed TL 880,000 for the year 2022. However, there may also be

some situations that may cause confusion in this case. There is uncertainty about the transfer of the earnings of the miners and the cryptocurrencies they produce. In this case, they are considered to be subject to withholding. In cryptocurrency exchanges, there is “corporate tax” in case of corporate structuring and “income tax” in case of individual intermediation.

CONCLUSIONS

The rising trend of trading volumes and market values of cryptocurrencies helps to create a new and different financial ecosystem. Aware of this great potential, governments are preparing new regulations in order not to be left out of the financial system. These regulations are made to protect both the system and the investor. In the same context, tax regulations are planned to protect the investor, regulate the system and generate tax revenue. In the upcoming period, to reduce the risks of this uncontrolled system, Turkey is also considering introducing certain regulations, taking into account the developments in the world.

At this point, the last regulation of the CBRT in April 2021 draws specific attention. In this regulation, cryptocurrencies were defined as “intangible assets” for the first time. While this definition is far from clear, it seems that cryptocurrencies are not considered securities or money and are considered commodities or intangibles. This definition, in the authors opinion evokes the concept of “commodity”. Accordingly, it is thought that cryptocurrencies will be fully defined in the coming period and their taxation will be determined precisely and clearly by law systems. However, it should be noted that cryptocurrencies are constantly developing and fulfilling different functions. Therefore, taxation should be implemented according to the priority of the essence, and the nature of the cryptocurrencies should be defined according to its function. If cryptocurrencies qualify as commodities, confusion over miners' earnings should also be removed with additional regulations.

Within the framework of today's tax laws, a way how the tax regulations are to be applied according to the nature of cryptocurrencies will differ and can be summarized as follows.

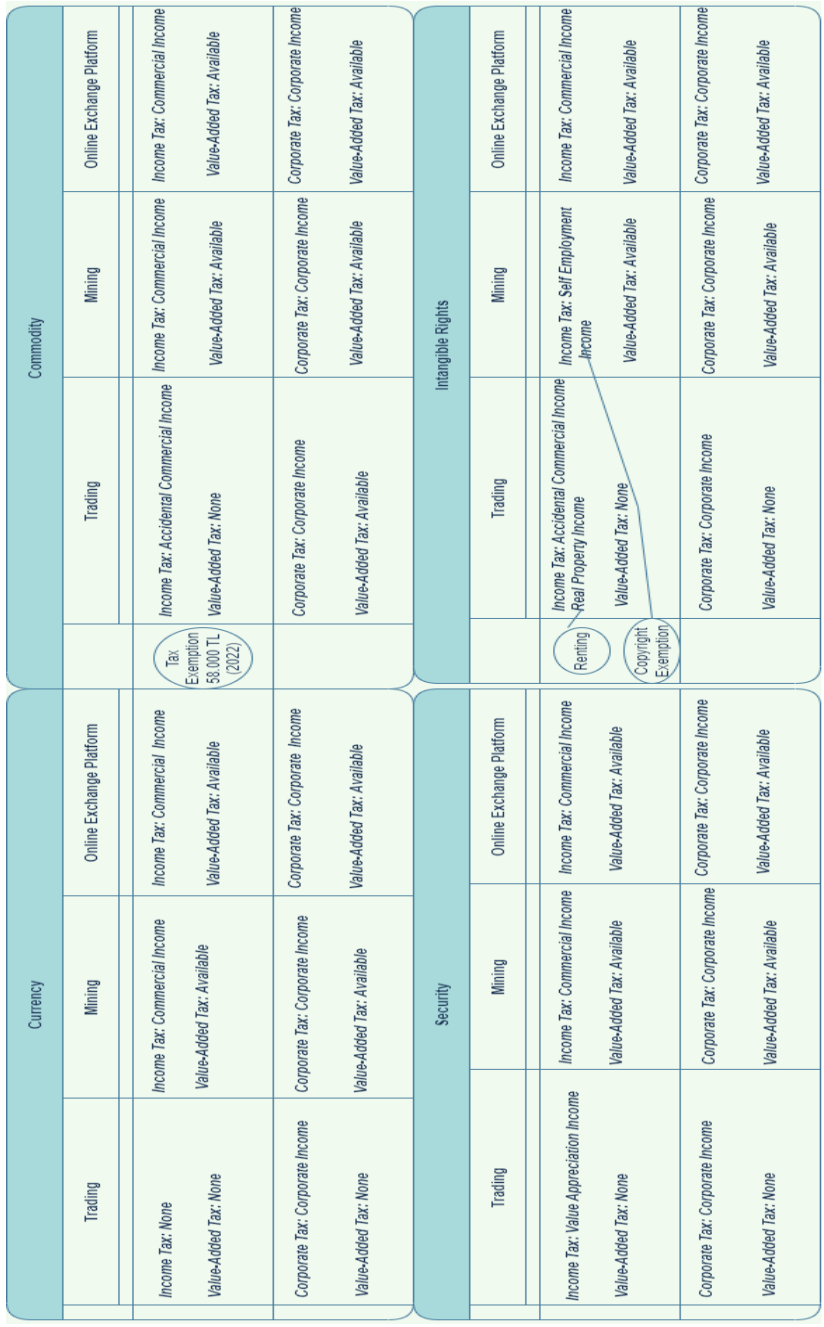

Chart 4. Taxation of cryptocurrencies in Turkish legal system

Source: prepared by the authors.

The regulations expected to be introduced regarding cryptocurrencies should not only be about buying and selling. Taxation of these transactions will be insufficient. In today's world, it is thought that different applications such as Non-Fungible Tokens (NFT) and metaverse should also be regulated. In addition, the issue should be evaluated in terms of the Central Bank Digital Currency (such as the Digital Euro, Digital Yuan, and Digital Dollar), which will be on the agenda in the future. Accordingly, it should be determined how the Digital Turkish Lira, which is planned to be implemented in 2022, will be taxed. It is believed that this practice will prevent tax evasion and fraud.

In the taxation process of cryptocurrencies, different policy recommendations are made. One of them is to expand the usage areas of cryptocurrencies such as Bitcoin, which provide large-volume use in daily life, instead of cryptocurrencies that are likely to be used in illegal activities and to impose small taxes on transactions with these currencies (Şahin, 2019: 177). It is observed that the place of cryptocurrencies in the financial system is solid, and the transactions made are developing day by day. Since it is thought that their place in the financial ecosystem cannot be changed by prohibitions and deterrent tax rates, this place needs to be expanded to allow central institutions to regulate. At this stage, when tax rates are determined in a way that encourages the use of a certain cryptocurrency rather than as a deterrent, this newly formed financial system will be regulated by central institutions and a taxable income will be generated.

In addition, when taxing cryptocurrencies, taxation similar to the Tobin tax should be considered to help protect against speculative capital flows. Tobin (1978) described his proposed tax on financial transactions as "throwing sand into the wheels of excessively productive international money markets" (Tobin, 1978: 154). This may be a valid assumption for cryptocurrencies as well. It is thought that regulating this highly speculative and risky system with an incremental taxation will prevent financial volatility and ensure the continuity of the system. In this context, it is recommended to determine low tax rates such as one per thousand or one per ten thousand with the tax to be applied. Thus, it is attempted to ensure that taxation does not evacuate investors and capital from the country. Contrary to tax lessness, which is the most important point that attracts investors in the Decentralized Finance (DeFi) ecosystem, it is an undesirable result that the investor will suddenly take the capital flight point with the large tax rates to be applied. Instead, it should be emphasized that the regulation of this system will be ensured with small taxes collected, and the awareness of protecting the investor/consumer will be acted upon. In this study, the authors of article propose the Tobin tax for Turkey and future studies may analyze whether low tax rates for the revenues earned in the crypto market are effective and applicable for the developed economies or other emerging markets in the world.

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