• F I N A N S E I P R A W O F I N A N S O W E •
• Journal of Finance and Financial Law •

wrzesień/September 2022 • vol. 3(35): 43–52

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

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

Member since 2021 JM15102

https://doi.org/10.18778/2391-6478.3.35.03

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).

ACKNOWLEDGEMENTS

This work was supported by FCT, I.P., the Portuguese national funding agency for science, research and technology, under the Project UIDB/04521/2020.

REFERENCES

Abankwa S., Blenman L.P. 2021, *Measuring liquidity risk effects on carry trades across currencies and regimes*." Journal of Multinational Financial Management", 60, pp. 100683.

Acharyal V., Pedersen L. H., 2005, Asset pricing with liquidity risk, „Journal of Financial Economics", vol. 77(2), pp. 375–410.

Akindayomi A., 2013, *Capital gains taxation and stock market investments: empirical evidence.* „Global Journal of Business Research", 5(2), pp. 1–12.

Amihud Y., Mendelson H., 1986a, *Asset Pricing and a Bid-Ask Spread*, „Journal of Financial Economics", vol. 17, pp. 223–249.

Amihud Y., Mendelson H., 1986b, *Liquidity and Stock Returns*, „Financial Analysts Journal", vol. 42, No. 3, pp. 43–48.

Amihud Y., Mendelson H., Pedersen L H., 2012, *Market liquidity: asset pricing, risk, and crises*. Cambridge University Press.

Bakri M.A., Nordin B.A.A., Tunde M.B., Theng L.W., 2020, Moderating Role of Financial Market Development on the Relationship between Stock Liquidity and Dividend, Asian Academy of Management Journal of Accounting & Finance", 16(2).

Bertsimas D., Lo A.W., 1998, *Optimal control of execution costs*, „Journal of Financial Markets", vol. 1, issue 1, pp. 1–50.

Chan H., Faff R., 2005, *Asset Pricing and Illiquidity Premium*, „The Financial Review" vol. 40, pp. 429–458.

Chordia T., Roll R., Subrahmanyam A., 2000, *Commonality and Liquidity*, „Journal of Financial Economics", vol. 56, Issue 1, pp. 3–28.

Dater V., Naik N., Radcliffe R., 1998, *Liquidity and Stock Returns: An Alternative Test*, „Journal of Financial Markets", vol. 1, pp. 203–219.

Demirgüç-Kunt A., Levine R., 1996, *Stock markets, corporate finance, and economic growth: an overview*. „The World Bank Economic Review", 10(2), pp. 223–239.

Dimson E., 1979, *Risk measurement when shares are subject to infrequent trading*, „Journal of Financial Economics", Elsevier, vol. 7(2), pp. 197–226.

Globan T., Škrinjarić T., 2020, *Penny wise and pound foolish: capital gains tax and trading volume on the Zagreb Stock Exchange*. „Public Sector Economics", 44(3), pp. 299–329.

Greenwood J., Jovanovic B., 1990, *Financial development, growth, and the distribution of income*. „Journal of political Economy", 98(5, Part 1), pp. 1076–1107.

Hossin M.S., Hamid M.K., 2021, *Capital Market Performance and Bangladesh's Economy: An Empirical Study*. „Global Business Review".

Ibrahim M., Alagidede P., 2018, *Nonlinearities in financial development–economic growth nexus: Evidence from sub-Saharan Africa*. „Research in International Business and Finance", 46, pp. 95–104.

Imai K., Kim I.S., 2021, *On the use of two-way fixed effects regression models for causal inference with panel data*. „Political Analysis", 29(3), pp. 405–415.

Karinga E.N., 2015, *The announcement effect of capital gains tax on stock performance at Nairobi Securities Exchange*, Doctoral dissertation, University of Nairobi.

King R.G., Levine R., 1993, *Finance, entrepreneurship and growth*. „Journal of Monetary economics", 32(3), pp. 513–542.

Nordin S., Nordin N., 2016, *The impact of capital market on economic growth: A Malaysian outlook.* „International Journal of Economics and Financial Issues", 6(7), pp. 259–265.

Obadha L.A., 2019, *An Event study on effects of Kenya's varying application of Capital Gains Tax on stock market performance at Nairobi Securities Exchange*, Doctoral dissertation, Strathmore University.

Orhan A., Kirikkaleli D., Ayhan F., 2019, *Analysis of wavelet coherence: service sector index and economic growth in an emerging market*. „Sustainability," 11(23), pp. 6684.

Ouyang Y., 2016, *Concept: Comprehensive Advantages of Large Countries (CAOLC). In The Development of BRIC and the Large Country Advantage*, Springer, Singapore, pp. 31–56.

Pastor L., Stambaugh R.F., 2003, *Liquidity risk and expected stock returns*, „Journal of Political Economy" 111, pp. 642–685.

Saccone D., Deaglio M. 2020, *Poverty, emergence, boom and affluence: a new classification of economies*. „Economia Politica", 37(1), pp. 267–306.

Sadka R., 2006, *Momentum and post-earnings announcement drift anomalies: The role of liquidity risk*, „Journal of Financial Economics" 80, pp. 309–349.

Samarasinghe A., Uylangco K., 2021, *Stock market liquidity and traditional sources of bank business.* „Accounting & Finance".

Shannon P., Reilly R., Schweihs R., 2000, *Valuing a Business: The Analysis and Appraisal of Closely Held Companies*. McGraw-Hill Library of Investment and Finance, 4th Edition (Hardcover), pp. 3–28.
Verbeek M., 2017, *A guide to modern econometrics*. John Wiley & Sons.
Wooldridge J.M., 2005, *Fixed-effects and related estimators for correlated random-coefficient and treatment-effect panel data models*. „Review of Economics and Statistics", 87(2), pp. 385–390.
Youhao,T., 1999, *On Big Country's Economy also on Chinese Economic Development Strategy* „Reform of Economic System".

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.

JEL Class: F38, G14.

Zakończenie recenzji/ End of review: 17.08.2022 r.
Przyjęto/Accepted: 10.09.2022 r.
Opublikowano/Published: 13.09.2022 r.