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The financial transaction tax: an ANOVA assessment of selected EU countries

Abstract

Research background: There are various forms of fiscal taxation of the financial assets. In recent times, the discussion about financial transaction tax in the EU is associated with finding the solution to problems due to great financial crisis. The European Commission has made some efforts to strengthen capital regulation and it has adopted the Directive about implementing enhanced cooperation in the field of financial transaction tax, where it analyzed options and impacts of FTT according to those countries which have already implemented similar transaction taxes in their national legislatives.

Purpose of the article: Our aim is to find out the economic relationship between FTT and economic growth and to analyze the effect of FTT within selected EU countries.

Methods: In this paper, we will analyze the banking environment in the EU area, and we emphasize the correlation between tax policy and economic growth. We will test FTT through three-way mixed-effects ANOVA, and analyze three Member states, Belgium, Ireland and the United Kingdom, which have very active attitude to implementation of FTT within other EU countries.

Findings & Value added: We are interested in: (1) testing the relationship between the financial transaction tax (FTT) and economic growth (GDP); and (2) to verify the hypothesis that FTT

could improve GDP growth in a country. We assume that if a country has adopted FTT in its tax system, then it will lead to a significant GDP growth, and so it could lead to financial market improvement after the crisis. Our results have shown that an increase in FTT volume would lead only to a negligible increase in the economic growth.

Introduction

The paper brings a closer view at research in taxation of financial transactions in the EU area. The main aim is to discuss the recent problems in financial accounting and taxation of financial instruments in bank institutions.

The first idea of financial transaction tax in the EU environment has emerged mainly after the post-financial crisis period (Mihokova *et al.*, 2018). When we compare the international economies, transaction taxes are not new instruments of the economy policy, as the world economies such as the United States, the United Kingdom, China, South Korea, Japan or Argentina have taxed transaction volumes of financial assets or operations at different rates for long-term period on their domestic markets. The market failures, unstable and too volatile development of financial asset prices and a lack of tax revenues from financial services start a debate on how to ensure the stability of the financial sector after the crisis. The transaction tax theory is based on rational economic expectations (Hilkevics & Semakina, 2019) and the assumption that financial market participants maximize their overall benefits and have all the information in the market when deciding on their investment strategies (Mura *et al*., 2017; Mittelman *et al*., 2017). It is necessary to know the potential impact of FTT on transaction costs, the impact on the public revenue, as well as on the social welfare in the society (Schäfer *et al*., 2012; von Weizsäcker & Darvas, 2010).

The aim of the paper is to verify the impact of tax paid as financial transaction tax on the economic growth within the selected European countries. We focus on those Member States which have already adopted similar tax in their national tax legislatives. We use three-way mixed ANOVA design to assess the results. We chose this methodology because it compares small samples with dependent continuous variables and independent categorical variables. To the best of our knowledge, recent authors did not choose this method to test the effect of FTT but rather to analyse an impact of changes in accounting policies o+n decision making in companies.

This paper has the following structure. The first section brings review of recent literature in the field of financial taxation. The second section presents the applied methodology and research hypothesis. The third section presents our results, and in the fourth section, there is a critical discussion

where we compare our results with similar studies in accounting and taxation area. The last section concludes.

Literature review

The International Monetary Fund (IMF) has proposed a transaction tax methodology based on the taxation of equities, capital and debt instruments, and in this form, it is applied by countries such as the US, Switzerland, the United Kingdom or Southeast Asian countries. The objective of the tax on equity instruments (or financial activity tax, FAT) is to ensure the correct valuation of financial instruments. However, opponents argue that FAT increases capital costs and leads to too low share prices, causing investors to have low returns on investment. On the other hand, the concept of a financial transaction tax (FTT) is different and involves the taxation of all financial transactions and all financial instruments (transactions of underlying assets, bonds and derivative instruments), exemption includes transactions by central banks and central security depositories. However, the current discussion at the EU level has led to a less ambitious agreement, and FTT will be applied at rate of 0.2% only to shares of companies which are registered in the Member State and whose market capitalization is at least 1 million EUR (euroactiv.com, 2019; Hemmelgarn *et al.*, 2016; Claessens *et al.*, 2010).

Fiscal taxes together with bank supervision and capital regulatory requirements play an important role in the economic system (Wollner, 2014). To ensure effective financial market, it is important to have free movement of capital. Mura *et al.* (2017) identify the existence and strength of the relationship between the economic freedom and economic growth and confirm the positive effect on the economy. In recent research of financial accounting, most of the studies deal with problems of financial reporting and theoretically make it clear how international accounting standards affect internal environment of a company, the whole economy and managing risks (such as Beatty *et al.*, 2014). There are three main areas to deal with in the field of financial taxation: (a) determining the form of taxation for financial instruments, the tax base and the optimal tax rate; (b) analysing the dependency of banking regulation and the fiscal system; and (c) analysing the impact of financial tax on economic growth and investment levels.

Firstly, it is quite difficult to determine what form of regulation of financial services is most appropriate in the research of regulation of the financial sector (i.e. taxation of gross, or net transactions), and at which level the tax rate should be set to make the tax system efficient and optimal

(such as Dobrovič *et al.*, 2018; Andrejovska & Pulikova, 2018; Berger & Bouwman, 2013; De Mooij & Keen, 2016; Jacobs & Boadway, 2014). The problem is that most financial services are exempt from taxation because there is an international transfer of capital within the countries. This insufficient tax burden of financial sector can cause budget problems, and problems with compensation for costs related to the crisis. The advantage of optimal taxation of financial transactions lies in the fact that it would bring a stable financial system, capital regulation and would limit the speculation of derivative instruments in tax strategies (Anyakoha, 2019; Andries *et al.*, 2017). The nature of the specific type of financial instrument and the tax burden should be considered when determining the rate of the tax rate for financial transactions. Tax rate proposals by EC ranging from 0.01 to 0.5% will bring a low burden on financial institutions and financial services intermediaries, while on the other hand, a higher volume of transactions on the market will ensure a greater effect of social welfare and more financial sources in the state budget. Studies such as Pomeranets and Weaver (2011); Peracek *et al.* (2018); Hau (2006); Baltagi and Li (2006) found out that there is a statistically significant positive relationship between transaction tax and trading volume, which means that with a low volume of trading in financial assets, the final tax revenue from the transaction tax would be low. Rühl and Stein (2014), based on Italian data, confirmed that the higher the volatility in the development of financial asset prices, the lower the liquidity in the financial market. The economic effect of financial management decision analysed Okanazu (2018), and summarized that to ensure the stability, adoption of business solvency is crucial in financial operations. The effect of local taxes on budget describes Darabos (2016) who states that taxes play a decisive role, and they serve as important sources of funding. Also, Ključnikov *et al.* (2019) confirm the close relationship between financial management and economic information.

The second area of research of FTT is the analysis of the dependence between banking regulation and the impact of taxes in the banking sector in different countries from the perspective of ensuring financial stability. Authors such as Chaudhry *et al.* (2015), Donohoe (2015) or Capelle-Blancard and Havrylchyk (2017) seek to analyse how effective regulation and the fiscal system should look to ensure economic stability. Empirical findings have shown that if fiscal taxes are an effective instrument for financial stability in accordance with banking regulation, then (a) funds raised from bank taxes and charges should be used to create "a correction fund" and a deposit guarantee fund; (b) the deductible item for interest expense on debt should be abolished; and (c) to avoid double taxation, Member States

should agree on tax harmonization and introduce common accounting standards for financial operations (Schandlbauer, 2017).

And lastly, let us clarify the recent discussion on the financial transaction tax within the EU countries. It aims to understand the effect of this tax on the harmonization and integration process and to analyse the relationship between FTT and the volume of trading. The introduction of a financial transaction tax in the EU is an instrument of economic policy to regulate transactions made on the financial market. The main objective is to curb speculative market transactions and prevent risky trades that have been the cause of the financial crisis (Haviernikova & Kordos, 2019). From the perspective of public finances (Dykha *et al.*, 2019; Osipov *et al.*, 2018; Okanazu *et al.*, 2019), FTT should generate additional tax revenues to cover the financial sector's costs in the context of the debt crisis. In the analysis of FTT revenues, the EC assumes that supplementary budget revenues will increase the stability of financial markets in uncertain times. Studies that analyse FTT in EU Member States examine its impact on economic agents, economic growth, and the effect the tax has on the integration process. Hvozdyk and Rustanov (2016) analysed how Italian FTT affects the volatility of the Italian capital market and concluded that financial transaction tax has a positive effect on the cost of capital, but no impact on market liquidity. This may mean that the performance of the capital market depends more on market liquidity and the tax burden is borne by financial institutions. Another study by Schulmeister (2008) emphasizes that a transaction tax reduces the volatility of asset prices and the tax revenue in the EU common budget would reach 1.6% of GDP at the rate of 0.05%.

In summary, we can state that the main benefits of the introduction of FTT in the market are:
– reducing the volume of speculative transactions in the financial markets,
– strengthening the efficiency of the capital market,
– transparency of trading on financial markets in line with the real economy,
– lower fluctuations in the financial asset prices,
– an additional source of public revenue,
– offsetting losses in the banking sector after the debt crisis,
– preventing fragmentation of financial markets.

On the other hand, the literature also provides evidence of the disadvantages of financial transaction tax. Economic theories seek to find a solution to how transaction tax can reduce the price volatility of financial assets and market liquidity, how it affects capital costs in the long-term period, or they explain the behaviour of economic agents that transfer capital to countries where financial transactions are not taxed. According to expert opin-

ions (Wang & Yau, 2012; Schulmeister, 2009), to the weaknesses of the financial transaction tax belong:
− threat of tax evasion,
− a slight negative effect on economic growth and GDP,
− wide tax base (all financial transactions and instruments on the market),
− tax revenue depends on the volume of transactions on the market,
− higher risk of short-term speculative trading,
− the problem of determining the tax base and who will bear the tax burden.

In this paper, we will analyse the effects of FTT on the economic growth. Opinions concerning the positive or negative effects of the tax on growth is very different in the literature. According to European Commission, if the tax rate of FTT were 0.1% then there would be a drop in GDP of -1.76% in the long run. Griffith-Jones and Persaud (2012) confirmed this negative impact of the FTT on level of GDP, however, based on their results GDP growth falls to -0.2%. On the other hand, some authors think that the impact of FTT on economic growth is more likely positive than negative, at around a minimum of +0.25%. This effect can be identified through channels (i.e. effects on final consumption, aggregate demand and government investments) that FTT could improve sustainable growth. Also important is the effect on the fiscal consolidation because tax incomes from FTT could reduce the cost of government debt (Irish Congress of Trade Unions, 2012; Griffith-Jones & Persaud, 2012).

If we look at FTT implementation through the experience by EU countries which have already applied similar taxes in their systems, there are 12 Member States which have adopted similar financial tax in their tax systems. The most advocates of the transaction tax are from Germany, France, Italy, the United Kingdom and Ireland, Benelux is represented by Belgium and the Netherlands, the Nordic countries have their representatives in the form of Denmark and Finland, and V4 countries are represented by Slovakia and Poland. However, within the Member states without this form of taxation are the Baltic countries.

The evidence that FTT has an influence on countries GDP growth can be found within some EU countries, such as:
− *Belgium:* in comparison with non-European countries, it has a relatively high share of transaction taxes in GDP, on average just around 1% of GDP.
− *Italy:* like Belgium, the share of these taxes in GDP in recent years has been ranged just above 1% of GDP.
− *France:* the value of the share gradually increased to 0.8% of GDP.
− *United Kingdom:* the value of the share has long been at 0.8% of GDP.

Before we start to analyse an impact of FTT on economic growth, it is necessary to introduce a brief description of banking environment to show why transaction activities realized by banks should be taxed. As economic practise has shown, fiscal taxation is charged particularly to those economic sectors which are above-average profitable, and their profit can increase revenues in the state budget. Consequently, these sectors can improve economic development in a country. In general, the banking and financial sector is more profitable than the non-financial sector, which is due to higher productivity. To illustrate the fact that the banking sector has sufficient resources that could be used to generate additional sources for government budget in the tax form, we followed the sector's profitability measured through the development of the two basic indicators — ROA and ROE. As there is an evidence that banks have enough financial resources and enough profit, we considered changes caused by the crisis and analysed bank profitability in Eurozone in 2008–18. We looked at ROA and ROE indicators in Eurozone. These variables show the quality of financial assets and own capital, and they indicate capitalization of the banking sector and provided lending. As can be seen from Figure, ROE, which explains the efficiency of own capital, was at the level of 10% in the pre-crisis period, then fell sharply to negative values -4%. The lower values are due to the low interest rates monetary policy. Lower profitability figures could jeopardize economic growth, or at least could have a harmful effect at the national level. Also low ROE can cause difficulties in financing business activities, as a decline in the yields of major banks may signal difficulties in allocating capital to the market. Since 2012, ROE has improved in value (6.08% in 2018), which means that the ROA indicator expresses a level of efficiency of assets and liability management. Compared to ROE, it better explains the decline in bank profitability and changes in the economic cycle after crisis. On average, value of ROA ranges from 0.4% to 0.6%. From our results, we see that in 2008 ROA was at the level of -0.11%, while the decline in 2009 was due to the decline in quality of financial assets, net interest and non-interest income, low refinancing rates and an increase in the cost of provisioning on non-performing loans. Then, due to central bank arrangements, its value improved slightly (0.20% in 2010), and from 2012 ROA raises every year (0.43% in 2018). This can indicate that banks in the Eurozone have overcome problems with assets quality.

To consider operational costs, cost-to-income ratio between Member States is quite high (above 60%) which means that banks have a negative perception of low interest rates, weak economic growth and their attitude towards financial market activities is uncertain. In the long term, structural reforms and the introduction of new investment and innovation would help

reduce banks' costs. When comparing profitability with US banks, recovery after crisis is slower on the European market, although a slight stabilization of the financial position has been observed since 2014 (KPMG, 2019; De Haan & Poghosyan, 2012).

As ECB states in Financial Stability Review, bank´s profitability plays important role as a support for economic growth, productivity and overall economic stability. Studies such as Albertazzi *et al.* (2010), Bobáková (2003) or Gambacorta *et al.* (2017) found out that bank profitability (measured by ROE) can increase economic growth, raise tax revenues and maintain macro- and microeconomic stability. Also, there is a hypothesis that banking sector is under-taxed in comparison to other economic sectors because of VAT exemption. Within the EU, experts discuss about VAT for financial services, however, due to specific characteristics of financial services, it is a very difficult topic.

To conclude, because of the financial crisis and low interest rate policy, banking and financial sectors noted regulatory changes, a decline in net interest income, an increase in operational and capital costs and a disruption in stable development. However, recent data have shown that the trend has turned, cost-to-income ratio has declined gradually, and banks have reached similar profitability as before the crisis. Arguments for taxing the banking sector claim that it is under-taxed, and so there is a reason to introduce FTT or other transaction tax with aim to raise total tax revenues. On the other hand, if FTT applies, there is an empirical evidence that banks can shift taxation on clients through lower operating costs and provisions.

Research methodology

This paper deals with the issue of taxation, especially taxation of financial transaction tax in the EU Member States. The paper focuses on the analysis of the need for fiscal taxation in the European financial market environment. We intended to assess whether the benefits of introducing transaction tax would influence tax revenue and economic growth in the country. We used data from Eurostat database and indicators "Real GDP growth rate — volume" as well as "GDP and main components" for the economic growth rates. For the tax analysis, we retrieved data from Data on taxation on the website of the European Commission (EC, 2019).

Since one of the arguments of lawmakers of financial transaction tax is that bank taxation will improve economic growth, we selected and tested three EU Member States which have already adopted this tax method into their national legislatives. If the financial transaction tax had been included

in the tax system, then an increase in revenues from this taxation would lead to economic growth. Our aim is to examine what the macroeconomic impact of established taxes has in these countries and their economic growth. We will focus on Belgium, Ireland and the United Kingdom, which have been strongly committed to the adoption of FTT in other countries over the past year.

As the original proposal of the EC suggested, we predict that FTT would strengthen the economic growth and the efficiency of tax collection. In our analysis, we are interested in a) testing the relationship between the financial transaction tax (FTT) and economic growth (GDP), and b) to verify the hypothesis that FTT could improve GDP growth in a country. We assume that if a country has adopted FTT in tax system, then it would lead to significant GDP growth, and so it could lead to financial market improvement after the crisis.

We set research hypothesis as follows:

H_0: *If the EU country applies financial transaction tax, then this tax would improve economic growth.*

To test the relation between dependent and independent variables, we use three-way factorial mixed ANOVA. This type of methodology is used in financial accounting mainly for testing experimental research focusing on the impact of specific accounting policy on investors´ decisions, changes in accounting standards and their impact on auditor opinion, financial managers' responsibility for the decision to record an asset impairment, or to find out how financial accounting can be based on psychological, economic and institutional theories (Libby *et al.*, 2002; Rennekamp *et al.*, 2014). We chose this statistical method because our sample contains one dependent continuous variable (real economic growth of GDP), one categorical independent variable between-subject (country) and one categorical independent variable within-subject (rate of FTT).

ANOVA analysis

For our analysis of financial transaction tax, we followed general European classification of taxation, as well as we chose financial transaction taxes as they are defined in individual countries. We chose only those EU states which have transaction taxes that by nature correspond to *the Proposal for a Council directive on implementing enhanced cooperation in the field of financial transaction tax*. In the absence of a uniform tax system between EU countries, we have decided not to use absolute taxation in the-

se calculations, rather the proportion of FTT_{it} (i.e. FTT in Belgium, Ireland and the United Kingdom) to the total volume of selected taxes in analysed countries. We used the following formula:

$$Tax_{it} = \frac{FTT_{it}}{TT_{it}}, \qquad (1)$$

where TT_{it} represents the volume of all taxes paid in individual Member state in a given year, and FTT_{it} expresses the amount of the relevant transaction tax in the given country and year. We assumed that this variable allows better comparison between the Member states. We analysed a period of 2000–2018, excluding years 2008–2009 because of the crisis period, and 2015 due to the prudent fluctuation in the Irish economic growth. Due to the fact this model consists of various factors, we decided to test FTT through *three-way mixed design ANOVA*. Mixed ANOVA allows to assess the impact of analysed variable by monitoring within-factors and between factors. In our ANOVA analysis, we chose between factor as Country, and within-factor as period (Years) and Tax_{it}. Our explained variable is represented by Economic growth (Growth).

The main benefit of mixed ANOVA is statistical power, which can be increased by including pre-test and post-test in model. On the contrary, the drawbacks are that mixed ANOVA must meet certain assumptions to estimate the main and the interaction effects. One assumption is to meet homogeneity condition, which means that two groups should have approximately the same error variance. The second assumption is that residuals must have normal distribution in all models.

It should be also noted that we chose only three EU countries in our analysis. Therefore, to improve this methodology and gained better review, further research should analyse FTT and economic growth at least within all Eurozone Member States.

Results

One of the conditions of mixed ANOVA is normality of selected data. Therefore, we firstly tested normality of variables, and then excluded those countries which did not fulfil this condition. We had to exclude countries because there is a very short time period since these states adopted transaction tax. After normality testing, we get three Member states which fulfilled normality condition, while for Tax_{it} variable we chose log of their values. We measured the economic growth in basic values (in %). For normality

test, we chose Shapiro-Wilcoxon test because it can be also used for small samples. We tested normality on significance level of α=0.05, and based on the results, for all three countries, we do not reject the null hypothesis of data normality. The results of normality test are shown in the table 1.

In calculation of the variable Tax_{it}, we chose two transaction taxes in all three analysed countries. The detailed characterization of these taxes can be found in Table 2.

Our basic model for testing FTT and economic growth is expressed by the following formula:

$$Y_{ijkl} \sim \mu + \alpha_i + \beta_j + \gamma_k + (\alpha\beta)_{ij} + \\ + (\propto \gamma)_{ik} + (\beta\gamma)_{jk} + (\alpha\beta\gamma)_{ijk} + \varepsilon_{ijkl} \tag{2}$$

where Y_{ijkl} represent the economic Growth of the ith Country in the jth Year of the kth Tax_{it}, then variables α_i β_j γ_i are the main factor effects for Country, Year and Tax$_{it}$; $(\alpha\beta)_{ij} + (\propto \gamma)_{ik} + (\beta\gamma)_{jk}$ are the two factor interaction effects for factor interactions; and $(\alpha\beta\gamma)_{ijk}$ are the three factor interaction effects. Variable ε_{ijkl} is the random error of kth observation from (i,j,k) treatment.

Subsequently, we compiled a model (labelled as Model A) to calculate three-way mixed ANOVA as follows:

$$Y_{ijkl} \sim \mu + \alpha_i + \gamma_k + (\alpha\beta)_{ij} + \varepsilon_{ijkl} \quad , \tag{3}$$

where Y_{ijkl} represent the economic Growth of the ith Country in the jth Year of the kth Tax_{it}.

Secondly, the time-adjusted Model B was based on this equation:

$$Y_{ijkl} \sim \mu + \alpha_i + (\alpha\beta)_{ij} + (\beta\gamma)_{jk} + \varepsilon_{ijkl} \tag{4}$$

and Model C, that is adjusted for the impact of the specificities of the countries can be expressed as:

$$Y_{ijkl} \sim \mu + \alpha_i + (\alpha\beta)_{ij} + (\alpha\gamma)_{ik} + \varepsilon_{ijkl} \tag{5}$$

From our testing of the basic model, we obtained the results (Table 3) that showed that the impact of defined log variable Tax_{it} is statistically significant, affecting economic growth for all analysed countries and throughout the reporting period. Model B adjusted by time effects, and Model C adjusted by country specifics, are shown in Table 4. For both

models, the results confirmed that transaction taxes were statistically significant, affecting economic growth in all countries and all years. This result follows our presumption. The decisive variable for economic growth seems to be the impact of the introduction and collection of transaction taxes in Belgium, Ireland and the UK, however, this impact is very small. Based on our calculations, a 10% increase in FTT_{BUI} volume will lead to an increase by 0.00007476% in terms of economic growth (Model A), by 0.000080103% (Model B) and by 0.00009935% (Model C), which is very unimportant and negligible economic growth.

We realize that the results are distorted by the short period of time, as well as the small amount of tax collection, or the lack of a uniform tax system within the Member States. Therefore, an analysis of financial transaction tax correlations will be the subject of our further research.

Discussion

Although our analysis has showed that there is only negligible impact of FTT on economic growth in a country, our predicted hypothesis cannot be rejected. In the hypothesis, we assumed that the effect of transaction taxes improves economic growth positively. Our results from ANOVA particularly follow the predictions made by European Commission (2013) on the proposal of FTT. As EC states, the introduction of this tax can slightly improve and increase the level of GDP, which confirms our hypothesis.

However, these results should be interpreted with caution. Firstly, we have surveyed a small sample, which included only three EU countries (i.e. Belgium, Ireland and the United Kingdom). We chose only those EU states which have already applied similar transaction taxes like the proposed European FTT and then, from that sample, we selected those countries which fulfilled the normality test on significance. Such studies as Griffin and Persaud (2012) have made opposite conclusion than ours, but they used different research methods (such as regression analysis, difference-in-difference, or DSGE models). To improve our conclusions about FTT effect on the economy, in the next research we will add to model another variable (such as tax rate, predicted tax revenues from FTT and market volume) and, to verify hypothesis, we will also use additional research method. Comparing the recent studies, we have found out that most authors analyse transaction taxes related not to economic growth, but rather to market efficiency.

In financial accounting and taxation, regression analysis is a statistical method that allows to find out a relationship between capital market and expected profits. For example, Cambell *et al.* (2011) examined expected

incomes from financial assets in relationship to market performance and fiscal taxes.

Difference-in-difference analysis (DID) is used in financial accounting to evaluate and compare the values of variables within time period in two groups, i.e. in treatment group and control group. For example, Schandlbauer (2017) examined optimal taxation on financial market in relationship to equity financing and tax shield. Another example of using DID is a study by Cappelletti *et al.* (2017), which explains the effect of FTT on volatility of the French and Italian stock market. Also, Colliard and Hoffmann (2013) examine the correlation between FTT and stock markets through DID and they state that applying FTT would lead to a negative effect on market volatility and market volume.

The advantage of DSGE model is that it can estimate the macroeconomic effects of policy changes. Applied to FTT, DSGE can interpret an increase in corporate income tax or changes in investment activities. However, as Griffin and Persaud (2012) states DSGE models neglect *"the critical difference in the incidence of the transaction tax caused by the different holding periods of the investor".*

Secondly, when we explain our results, we should be careful because there is absence of some other macroeconomic indicators that can influence our analysed variable in a significant way. In our model, we did not include market volume or volatility of assets prices. However, these indicators have also significant influence on the volume of FTT, and therefore we should include them in future research.

Conclusions

In this paper, we dealt with the financial transaction tax in the selected European countries. We intended to assess whether the introduction of FTT in some EU countries would influence economic growth in a positive way. Our motivation to write this paper was to open a debate among the public on this special and very recent issue and to discuss how to improve and harmonise taxation in the EU.

We used mixed 2x3 between-subjects design mixed ANOVA because of the small sample. As dependent continuous variable we chose economic growth, and as independent categorical variables FTT and individual EU country were selected. Our results have showed that for all three analysed countries the effect of FTT is statistically significant, but very negligible. Based on our calculation, a 10% increase in FTT volume would lead to an increase by 0.00007476% in economic growth (Model A), while in adjust-

ed Model B it would increase by 0.000080103% and by 0.00009935% in Model C.

The limitation of this paper lies in the short period of time, as well as the small sample considered in analysis. In our next research, we will focus on FTT from more detailed review and we will analyse the impact of FTT within all EU11, respectively at EU–27 level, using also additional methods to verify presumptions.

In the further research, we see an opportunity in zeroing in on prediction of tax revenues from FTT in correlation to GDP. Also, in our opinion it is challenging for future research to identify the level of tax rate and tax base of common FTT in the EU Member States. This is especially important to know because of the discussion about fiscal harmonisation and integration process.

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Annex

Table 1. Resulting statistic values and p-value of the Shapiro-Wilk normality test

Country	W (Test statistics)		p-value	
	$log\,Tax_{BUI_t}$	Growth	$log\,Tax_{BUI_t}$	Growth
Belgium	0.94849	0.94183	0.4661	0.372
Ireland	0.95392	0.97047	0.5543	0.8462
UK	0.89481	0.94164	0.06642	0.3696

Table 2. Brief description of financial transaction taxes in selected EU countries

| Country	Tax	Description
Belgium	Bank Levy and Stamp Duty	Levied only in a limited number of cases, e.g. stock exchange tax on transactions in public securities and other financial instruments (at rates ranging from 0.09% to 1.32%) (Deloitte, 2019).
Ireland	Bank levy on DIRT accounts & Stamp Duty (capital transactions)	DIRT is deducted at source by financial institutions. For 2019 the rate of DIRT is 35% and is due to be reduced to 33% for 2020 and remain at that level. (Revenue.ie, 2019) Stamp duty at a rate of 1% of the consideration paid for (or, where relevant, the market value of) the shares of an Irish incorporated company may be payable by the purchaser or transferee. (Thomson Reuters, 2019).
UK	Bank Levy and Stamp Duty	The bank levy is a tax on bank liabilities. There is a standard rate, originally planned to be 0.075 per cent but subsequently repeatedly raised to 0.21 per cent on long-term liabilities together with a short-term liabilities rate of half the standard rate. (taxpayersalliance.com, 2019; Gov.uk, 2019).

Table 3. Results for Model A

Model A	df	Sum Sq	F value	p-value
Country	2	0.0096166	20.1952	7.858e-07
Log Tax	1	0.0018061	7.57	0.008732
Country: Year	3	0.0007440	1.0416	0.384353
Residuals	41	0.0097617		

Table 4. Results for adjusted Model B and Model C

Model B / Model C	df	Sum Sq	F value	p-value
Country	2 /2	0.0096166 / 0.0096166	20.6157 / 20.6122	6.365e-07 / 7.795e-07
Year/Country: Log Tax	1 / 3	0.0019352 / 0.0008139	8.2973 / 3.4297	0.006287 / 0.02621
Country: Year	3 / 3	0.0008139 / 0.0024002	1.1632 / 1.1631	0.335405 / 0.33614
Residuals	41 / 39	0.0095627 / 0.0090977		

Figure 1. The development of profitability in banking sector in EU
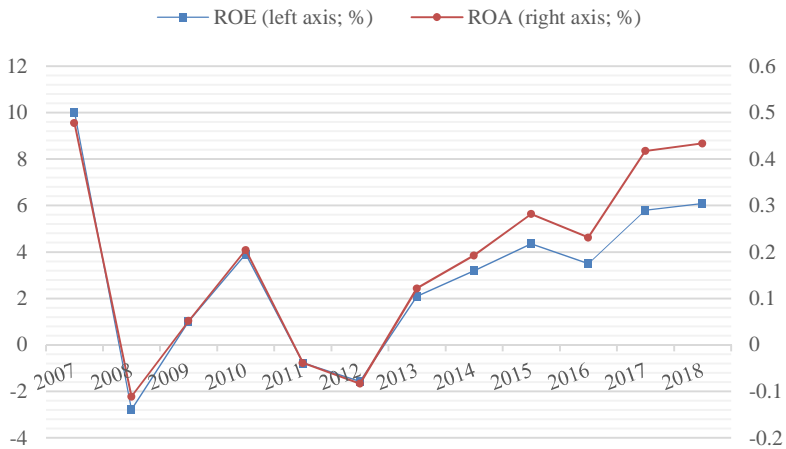
Source: own calculation based on ECB Statistical Data Warehouse (2019).