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FINANCIAL TRANSACTION TAX: DETERMINATION OF ECONOMIC IMPACT UNDER DSGE MODEL

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Abstract

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The discussion about the possible taxation of the financial sector has started in the European Union as a result of the financial crisis which has spread to the Europe from the United States in 2008 and consequently of the massive financial interventions by governments made in favour of the financial sector. On 14 February 2013, after rejection of the draft of the directive introducing a common system of financial transaction tax in 2011, the European Commission introduced the financial transaction tax through enhanced cooperation. The aim of the paper is to research economic impact of financial transaction tax on EU (EU27 or EU11) with respect to the DSGE model which was used for the determination of impacts. Based on our analysis the DSGE model can be considered as underestimated in case of the impact on economic growth and an overestimated in case of the revenue collection. Particularly, the overall impact of the financial transaction tax considering cascade effects of securities (tax rate 2.2%) and derivatives (tax rate 0.2%) is ranged between –4.752 and 1.472 percent points of GDP. And further, is assumed that the relocation effects of business/trade can be in average 40% causes a decline of expected tax revenues in the amount of 13bn EUR. Thus, at a time of fragile economic growth across the EU and the increased risk of recession in Europe, the introduction of the FTT should be undesirable.

Keywords: financial transaction tax, economic growth, EU, enhanced cooperation, DSGE model

INTRODUCTION

The discussion about the possible taxation of the financial sector has started in the European Union as a result of the financial crisis which has spread to the Europe from the United States in 2008 and consequently of the massive financial interventions by governments made in favour of the financial sector. Specifically, Member States individually committed to support the financial sector for a total of about EUR 4.6 trillion (39% of EU-27 GDP in 2009). As the financial sector has played a major role in causing the economic crisis, there is a strong consensus not only within Europe but also internationally that the financial sector should contribute more fairly given the costs connected with the crisis and the current under-taxation of the sector.

On 28th September 2011, the Commission published a draft of the directive introducing a common system of financial transaction tax, to be implemented by member States by 1st January 2014. However, some of the EU Member States rejected the implementation of financial transaction tax (hereinafter FTT), therefore European Commission decided to introduce the tax through enhanced cooperation – i.e. that it will be implemented only by EU Member States willing to participate.

Legal basis for the taxation of the financial transactions through enhanced cooperation in EU can be found in two basic documents. The first represents the Council Decision 2013/52/EU of 22 January 2013 authorising enhanced cooperation in the area of financial transaction tax. Under that decision the Member States listed

in Article 1[1] are authorised to establish enhanced cooperation in the area of financial transaction tax. The second document represents the proposal for a Council Directive implementing enhanced cooperation in the area of financial transaction tax of 14 February 2013[2] (hereinafter FTT Proposal).

After introducing of the FTT Proposal which covers "all actors, all instruments and all markets" within the group of the EU11 Member States who signed up the enhanced cooperation in the area of FTT, has started huge discussions about impacts of the FTT on economy and on participating/non-participating Member States. The aim of the paper is to research economic impact of FTT on EU (EU27 or EU11) with respect to the dynamic stochastic general-equilibrium model (hereinafter DSGE model) which was used for the determination of impacts.

Theoretical Background

First scientific work, which has been focused on the idea of financial transaction tax in the form of security transaction tax, was presented by (Keynes, 1936). After more than 40 years, he was followed by (Tobin, 1978), who suggested the imposition of the FTT on currency trading as a one percent tax with aim to mitigate cross-border flows of capital, excessive speculation and thereby decreasing volatility in the markets. Further (Eichengreen, Tobin and Wyplosz, 1995) state that introduction of FTT would curb speculation, systematic risk and lead to better allocation of capital.

Based on the following theoretical literature there can be identified two main streams – FTT proponents and FTT opponents. Proponents of the FTT argue that the FTT would mainly reduce the incentive for high-frequency trading (hereinafter HFT) and short-term trading, which are considered by them as highly speculative, increasing volatility of the markets and having a destabilising, harmful and speculative effect (Summers and Summers, 1989). Further, (Cortez and Vogel, 2011) underline that short-term speculations cause severe deviation from the theoretical price equilibrium in the long-term perspective, which have a negative effect on the long-term economic growth. As mention (Summers and Summers, 1989) some form of FTT would have not only desirable economic effects of curbing speculation but also raising a significant amount of revenues. The revenue potential would mainly depend on how a tax is designed and administrated. Similarly it is mentioned by (Stiglitz, 1989), a such tax is likely to increase the overall efficiency of the economy as well as stock market and reduce the national deficit through increased tax revenues. Another positive effect of the FTT was mentioned by (Palley, 1999), who concluded, that FTT can eliminate individual "noise traders", as well as (Westerhoff, 2003), who states that FTT can reduce volatility by curbing speculations.

On the contrary, opponents of the FTT argue that FTT would increase the transaction costs and subsequently lead to the higher costs of capital for companies. As investors will demand a higher expected return commensurate with the added costs which lead to the lower price of assets (Schwert and Senquin, 1993, Habermeier and Kirilenko, 2003; Wang and Yau, 2012). Further, (Matheson, 2010) states that the increased transaction costs of short-term transactions will have a large effect on assets valuation, assets price and cost of capital, therefore it is likely that there will be shifting away from short-term products towards long-term products or non-taxed products. In that respect (Baltagi, Dong Li and Qi Li, 2006) and (Schwert and Senquin, 1993) underline that trading volume decline after introducing the FTT. It was also proved by (Umlauf, 1993) on the empirical example in Sweden, where after imposition of transaction tax during 1980–1987 more than 50% of the volume migrated to non-taxed or lower-taxed jurisdictions. In addition, several opponents argue that the FTT would reduce liquidity and increase volatility in the market, based on the experience of other countries[3] which have adopted similar financial sector taxation (BlackRock, 2012 and Healey, 2013). However as mentions (Matheson, 2010) the net effect of a transactional tax on securities on volatility depends on market microstructure and the composition of trading, it could cause an increase or decrease of the price volatility.

Regarding the level of the tax rate, (Spahn, 1995) suggested two tire rate system, specifically low-rate FTT and exchange surcharge at prohibitive rate. Further, (Mende and Menkhoff, 2003) underline that low Tobin's type tax will not eliminate speculation and a high tax rate will significantly reduce liquidity. Therefore, while (Tobin,1978) suggested one percent tax rate, later due to the concern about the decrease in the market liquidity and about the tax evasion in the form of driving the activity off-shore, (Pollin and others, 2003; Sprat, 2006; Kapoor and others, 2007)

1 Namely Austria, Belgium, Estonia, France, Germany, Greece, Italy, Portugal, Slovakia, Slovenia, Spain. Hereinafter FTT zone, EU11 or FTT jurisdiction.

2 European Commission, 2013, Proposal for a Council Directive implementing enhanced cooperation in the area of financial transaction tax, COM(2013) 71 final, 2013/0045 (CNS).

3 France's market share of European equities plummeted nearly a quarter since the introduction of a national FTT on August 2012. Based on the average of monthly market share figures for the first 11 months the tax has been implemented, compared to the preceding year, France's share of European equities has slipped 23.4% to 13.11% from 17.12%. Further the market share high registered in June 2012 of 20.72% marked a 37.8% decline compared to the estimated 2013 market share value of 12.88%.

or (Schulmester, Schrazenstaller and Picek, 2008) suggest tax rate not being higher than one-half of the basis point.

Concerning the discussion whether to place the FTT within the EU, there can be identified two situations based on practical experiences of some European states. The first one, when some countries currently do not have their FTT in force, as they abolished their FTT in past. For example, Spain (1988), Germany (1991), Sweden (1991), Netherlands (1990) and Denmark (1999) which abolished their FTT mainly during the 1990s. The second one, when some countries do have their FTT in force, for example the United Kingdom and Switzerland. In the United Kingdom, financial transactions are subjected to a Stamp Duty or Stamp Duty Reserve Tax in the amount of 0.5% of the consideration for the transfer of the shares. In Switzerland, the securities transfer tax is levied on domestic and foreign securities where a party to the transaction is a Swiss security leader. In that perspective, (Cortez and Vogel, 2011) state that if countries as the United Kingdom, Switzerland, China, India, Hong Kong, Singapore and others use the FTT or similar kind of tax without damage to the competitiveness of the financial markets or other worries, the introduction of the FTT is politically desirable in terms of guiding behaviour through taxation, and even reasonable in an economic sense. Moreover, the FTT is mainly considered as a tool for raising the revenue and collecting back financial interventions which had been made by governments during the financial crisis.

MATERIALS AND METHODS

In order to determine the limitations of DSGE model, the analysis of model description, parameters and its results was performed. The basic sources of the research were the FTT Proposal, Impact Assessment accompanying the document Proposal for a Council Directive on a common system of financial transaction tax from 2011 and Impact Assessment accompanying the document FTT Proposal from 2013. Further, another basic source of the research was the DSGE model by Lendvai J., Raciborski R., Vogel L., which was used after that by European Commission for an analysis of the effects of FTT on economy.

European Commissions made some assumptions in the respect of DSGE model. Based on the European Commission opinion, the use of DSGE model represents a standard procedure of estimating the macroeconomic effects of policy changes. The model is a two-period and closed-economy model including hypothesis that the new "steady state" would be reached after 40 years, in 2050[4]. Moreover, it is also based on the assumption that only part of the sources of financing is affected by the tax on financial transactions. Since the companies have access also to the alternative sources of finances that are not subjected to FTT e.g. borrowing from banks, raising of capital through venture capital funds; and primary markets are excluded from taxation. Those sources of financing represent between 60 and 80% of all financing of investment. Under these assumptions, the possible deviation of GDP was established by European Commissions at –0.28% of percent points. However, it is assumed that revenues generated by the FTT will be spent on growth-enhancing public investment or recycling back into the economy. Then, the net effect of introducing FTT on the long run level of GDP would be expected to be by European Commissions in the range between 0.1 and 0.1 percentage points.

The DSGE model by Lendvai J., Raciborski R., Vogel L. integrates noise trading (its share 50%) and the securities transaction tax (hereinafter STT, rate 0.14%) in a general-equilibrium model that links financial and real sector variables. DSGE model assumes two types of traders (namely households as noise traders or fundamental traders, and firms) and an atomistic market structure. Households have a long-term investment horizon and own a fixed share of total equity on which they earn dividends. The equity owned by them is not publicly traded and accounts for a larger part of total equity. The value assets that are never traded is unaffected by the STT. Noise traders have short planning horizons, which emphasizes the short-term return orientation of their transactions. Noise traders borrow from non-trader households and invest to funds into publicly-traded corporate stocks. Then when they receive return on the investment, they return the borrowed funds plus interest to the non-traded households and consumed the remaining profit. Firms choose employment, the capital stock and investment to maximize the discounted flow of expected future dividends. The majority of corporate equity is own by non-trader households. As firms have a preference for financing by non-trader households that require lower returns, making financing cheaper. The opportunity of raising funds for new investment by long-term borrowing from non-trader households or stock insurance is constrained by the current value of the firm as reflected in the equity value. The equity value of the firm consists of two types of assets, particularly value of publicly-traded stocks and of private equity.

Further the DSGE model includes government that consumes an exogenous amount of goods and receives tax income from wages, corporate income and financial transactions. The DSGE model uses

4 Instead of being 81.4% above today's level, the European GDP in around 2050 would have risen by 81.1% above today's level. Thus the annual impact would be "negligible" about 0.01% per annum.

of lump-sum taxes to stabilise the debt-to-GDP ratio and eliminate the income effect of the STT. The parametrisation of the real economy part is standard in the RBC[5] literature, e.g. government purchases account for circa 20% of GDP, labour income tax rate is 40%, corporate income tax rate is 20%, public debt equals 50% of GDP and investment share is 23% of GDP. In case of financial sector, the share of noise traders is set to 50% in line with evidence on trading behavior in markets. The share of stocks owned by non-trader households is 80%. The STT rate is set to 0.14%, which generates a steady-state tax revenue of around 0.1% of GDP. Moreover the DSGE model considers the response of the economy to fundamental and non-fundamental disturbances as technology and noise shocks, in the presence of an STT. However, the DSGE model focuses on corporate equity and excludes other classes of risky assets, i.e. the model excludes derivatives. Time intervals for financial trading and decisions on real economic variables were imposed as quarters of years. The following Tab. I below presents the DSGE model parameters.

The STT's impact on financial variables and economic aggregates base on the DSGE model is summarised in Tab. II below. As can be seen there is negative impact of the STT on economic efficiency e.g. the introduction of STT causes decline of the price of the trade equity and its trade circa –8%, with the result of increase of the return on shares by 1.25% and declining of investment and capital by –0.43%. Further, real GDP decreases by 0.19% in the long term as well as employment and consumption. In the respect of tax revenue the STT would generate circa 0.09% of GDP in steady state.

I: *Parameters of DSGE model*

Name of parameter	Value
Discount factor	0.99
Elasticity of labour supply	1.00
Labour weight in utility	5.00
Labour share in production	0.64
Capital depreciation rate	0.025
Financing constraint	0.025
Public debt-to-GDP target	0.50
Labour tax rate	0.40
Capital tax rate	0.20
STT rate	0.0014
Long-term share holding	0.80
Share of noise traders	0.50
Trader endowment	0.10
Tax rebate to traders	0.00
Financial transaction costs	0.01
Persistence of technology shock	0.95
Steady-state technology shock	1.00
Steady-state noise shock	0.00
Standard deviation of technology shock	0.0072
Standard deviation of noise shock	0.0707

Source: Lendvai J., Raciborski R., Vogel L., 2012

II: *Impact of STT on mean values and volatilities*

Variables	Mean (%)	Std (%)
Output	–0.19	–0.99
Capital	–0.43	0.15
Investment	–0.42	–3.59
Consumption	–0.02	–3.25
Employment	–0.06	–8.28
Real wage	–0.14	–0.34
Share trade	–8.40	–12.25
Share price	–8.40	–1.74
	Mean (pp)	**Std (%)**
Return on shares	1.25	–8.61
Risk-free return	0.00	–7.59
Return on physical capital	0.04	–1.57
Transactions costs/GDP	–0.06	–2.61
STT revenues/GDP	0.09	

Note: The table compares scenarios without and with STT and reports the percentage (%) or percentage point (pp) changes in the mean and the standard deviation of the variables for identical shocks. Values in the first column (mean) report the percentage change in the steady-state level in response to the introduction of the STT. The second column (std) shows the percentage change between the standard deviation of the variables with and without STT.

Source: Lendvai J., Raciborski R., Vogel L., 2012

Further, the methodology developed by (Marsden, 1983) and (Romer and Romer, 2007) was used to quantify economic impacts of the FTT on the GDP.

Relocation effect of the FTT was researched based on the analysis of the experiences of countries which introduced the FTT or similar kind of tax was performed. Particularly the experiences of Sweden, Germany, Brazil, Switzerland, France and Italy were analyzed. Further, for the indication of countries in FTT zone, which can relocate their business or trade out of FTT zone, was used net balance of international transaction in insurance and financial services presented by Eurostat in National Account.

RESULTS

1. Limitations of DSGE Model

One of the concerns is the potential deleterious effect on economic growth. As states European Commission (2011), based on the original Impact Assessment it is estimated a decrease in the future

5 Real business cycles.

GDP growth in the long run by 1.76%[6] of GDP, compared to a negative **impact on GDP growth of –0.28%(percent point)**[7] as a result of the increase in the cost of capital in relation to the current Impact Assessment for FTT proposal through enhanced cooperation (European Commission, 2013). This difference arises mainly from revised economic modelling, and from the fact that tax revenues collected will be spent on growth-enhancing public investment with a positive impact of such spending in the amount of 0.2 and 0.4% of GDP as state (European Commissions, 2012 and 2013). Further European Commissions (2013, p. 46) estimate that the net effect of introducing FTT on the long run level of GDP would be in the range between –0.1 and 0.1 percentage points.[8] In addition, they also estimate that the cost of capital in the EU11 would rise by 7bp and that the cost of capital in non-EU11 Member States would also rise, albeit marginally. On the contrary, other analysis by third party estimates that the FTT could result in a 3.6% drop in business investment and a **reduction of 1% of GDP**. Although (Griffith-Jones S. and Persaud A., 2012) estimate that the impact of introducing the FTT on the level of GDP could be positive, at **around +0.25%** as a minimum due to the assumption of the positive effect of the FTT in the form of reduced risk of future crises.

However, as regards to the general equilibrium model[9], specifically Dynamic Stochastic Equilibrium (hereinafter DSGE) model which was used by the Commission to estimate the effects on economic growth in EU, and then revised, there are a number of concerns. European Commission's model did not adequately factor-in the full impact, as it ignored certain important aspects.

Firstly, the model takes only into account the tax on securities, **not on derivatives**, despite of the fact that derivatives account for a large share of transactions in financial markets today. The size of the world's OTC Derivatives Market by notional value was approximately $693 trillion at June 2013 as states (BIS, 2013)[10]. Contrast with the total value of the world's financial stock, comprising equity market capitalization and outstanding bonds and loans in the amount of $212 trillion at the end of 2010 as mentions (McKinsey & Co, 2011). The exclusion of derivatives from the model results in the model falling to analyse any impact of the FTT on using of derivatives as a tool for hedging or financing and their impact on economic activity, GDP. However, it is important to note that derivatives were not excluded in case of the revenue estimations. It cannot be assumed that additional tax revenue collection from the taxation of derivatives can be received without a change of the impact of the FTT on GDP. Since is assumed that imposition of the FTT on securities causes a decrease GDP growth of 0.28%, in case of derivatives is also assumed negative impact on GDP growth (for determination of the impact, see a chapter 2 below).

Secondly, the model represents a **closed economy model** without any consideration of relocation effects and capital migration, which are important aspects for evaluation of impacts of the FTT. In the open economy, if the FTT is imposed on the financial transactions, the transaction costs of trading will increase, with results of decreasing of the expected net return to investors. After that two situations can be identified. *In the first situation* due to the fact of a freedom of movement of capital in EU can be expected that investors would move their capital out of FTT zone[11] to avoid a FTT and generate similar or higher net return. Moreover financial institutions from FTT zone would relocate their business out of FTT zone to avoid the FTT or at least would eliminate intermediaries[12] involved in the taxable transactions to reduce the overall FTT. These actions will result in the change of the business structures and in reducing trading in FTT markets. *In the second situation*, investors will require a higher gross rate of return that causes both higher cost of capital for companies and eliminates investments of companies in the real economy. Trading activities will reduce. It is questioned whether reduced trading decreases volatility based

6 Based on Eurostat's GDP figures for 2010 it is EUR 286bn.

7 As a consequence, in such a scenario, instead of being 81.4% above today's level, the European GDP in around 2050 would have risen by 81.1% above today's level. Thus the annual impact would be "negligible" about 0.01% per annum.

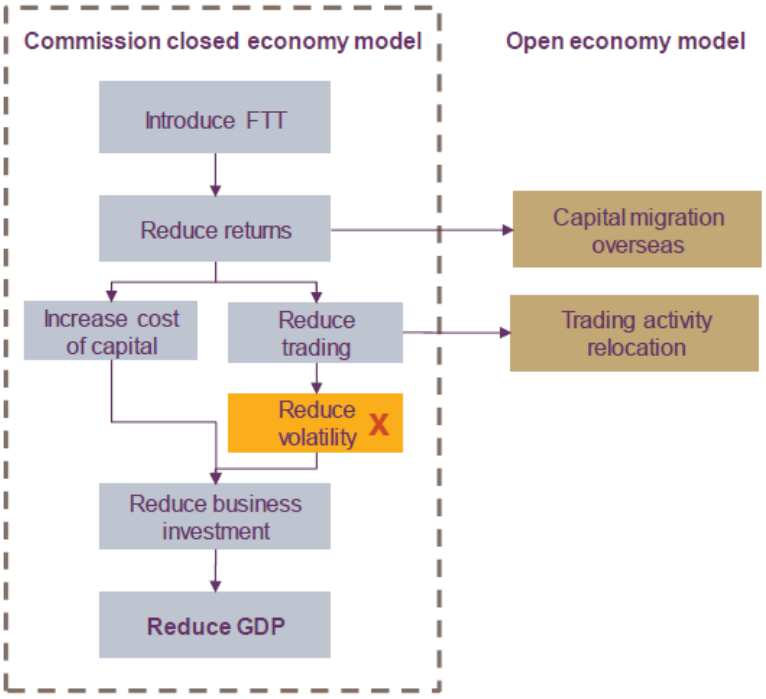
8 It is the deviation from a scenario without the tax of the level of GDP after about 40 years.

9 For more details on the model specifications ECFIN(2012) – Securities Transaction Taxes: Macroeconomic Implications in a General-Equilibrium Model (economic paper by Rafal Raciborski, Julia Lendvai, Lukas Vogel).

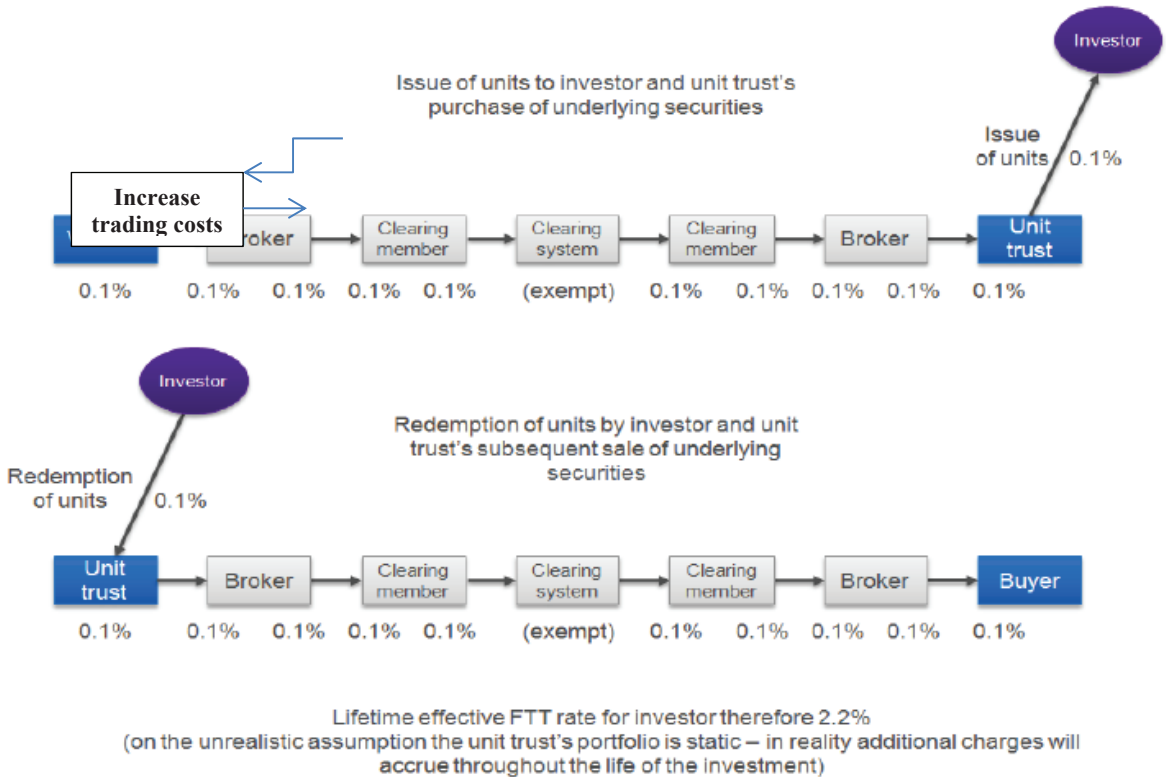
10 Moreover, under FESE, BIS and European Commission the total trade volume of derivatives was in the amount of 122,199 bn. EUR for EU27.

11 For example there are experiences of some countries which implemented similar kind of transaction tax in past: The introduction of FTT in Sweden caused trade migration to non-taxed or lower-taxed jurisdiction with the result that 50% of all Swedish equity trading had moved offshore. In UK the market responds to the introduction of the Stamp Duty tax was the substitution of equity trading for the trading in equity derivatives and trading in American Deposit Receipts. In Switzerland, after introduction of Stamp Duty in 1994, the mutual fund business relocated to Luxemburg, the eurobond and equity businesses relocated to London. In Germany was similar situation when 30% of trading in German government bonds, 50% of trading in other Deutsche Mark-denominated bonds and 80–90% of trading in floating rate Deutsche Mark-denominated bonds migrated to London. And in Brazil after introduction of Brazil FTT on all foreign portfolio investments, foreign investors reallocated capital to Brazil ADRs in New York.

12 Through the elimination of intermediaries is reduced overall effect of the FTT. See cascade effect of FTT below.



1: *Conceptual basis of the closed-economy model, and links to the impact of using an open-economy model*
Source: Oxera, 2011



2: *Cascade effect of the proposed FTT*
Note: Increased transaction costs due to the FTT could result in:
1. Discouragement of sound investment management practices (e.g., diversification and hedging).
2. The security holder foregoing income from lending securities.
This example assumes that trading behaviour/methods would remain unchanged.
Source: AIMA, 2012

on the divergent evidence about impact of the FTT on volatility. However, overall result for both situations is a decrease the capacity of the financial sector in economy, a lower economic growth and lower GDP (see Fig. 1 above).

Thirdly, the model assumes that **noise traders** (high-frequency trading) **increase volatility** and that the high-frequency trading has no economic value. Their share on trades is set on 50% in the model. Based on these assumptions the Commission reduced by 40% the impact of FTT on GDP. However, this reduction only on the side of the impact of the FTT on GDP is questionable, because the reduction was not also made on the side of revenue estimation. Further, zero economic value of high-frequency trading is also questionable, because there is no evidence about it. Conversely, there is evidence about ensuring liquidity, efficiency and lowering transaction costs by them in markets (AIMA, 2012; Vella J., 2013; Vella J., Fuest C., Schmidt-Eisenlohr, T., 2011).

Further, this model assumes an **imposition of the FTT only once to each transaction**, rather than to both sides of each transaction, and it does not take into account a cascade effect of the FTT. Thus overall amount of tax rate is at least 0.2% for final securities transaction and 0.02% for derivative, but it could be even higher, it depends on the number of transaction (number of intermediaries) required to complete the final transaction. As can be seen in Fig. 2 above, if there are 5 intermediaries between vendor and investor or investor and buyer, the overall amount of tax rate is 2.2% for the final securities transactions. In addition, this model does not take into account tax evasion and its impact on the reducing of tax revenue.

2. Determination of Excluded Impacts from the DSGE Model on the GDP

Generally, as states macroeconomic theory, if taxes increase then the consumption function decreases as well as GDP. Marsden, K. (1983) mention that the tax increase of 1% of GDP results in decreasing of GDP by 0.36 percent point. Romer and Romer (2007) state that the tax changes have very large effects on the GDP, specifically an exogenous tax increase of 1% of GDP lowers real GDP by roughly 2 to 3 percent. Further, (King and Rebello, 1990) mention that an increase of income tax by 10% will result in a change in the growth rate in the value of –0.0152. And further, an increase capital tax by 10% will result in a change in the growth rate in the amount of –0.0052. Moreover, (Xu, B., 1994) state that a tax on income or investment will always have a negative direct effect on the long-run growth rate because it reduces the incentive for agents to behave in a growth enhancing way. However, that taxation may have indirect growth effects, provided that the generated tax revenue is used to invest in public infrastructure. So the net growth effects of taxation will depend on the mechanism that growth is driven and the way that tax revenue is spent.

If the results by Marsden K. and the World Bank and by Romer and Romer are taken into account, then in case of derivatives the impact of the FTT on GDP growth is ranged between 0.0072 and –0.04 percent points of GDP without considering a cascade effect. Overall impact of the FTT considering securities and derivatives is after that between **–0.2872 and –0.32 percent points of GDP**. This value is twice lower than another value of –0.73 which is determined based on the assumption if a taxation of securities affects GDP in the value of –0.28, then a taxation of derivatives should affect

III: *Revenue estimations by product group (in EUR bn.) and its impact on GDP (in percent points)*

Revenue estimations			**Impact on GDP**			
	EU27	**EU11**	**GDP**			
Securities	**19.4**	**13.0**	–0.28			
shares	6.8	4.6				
bonds	12.6	8.4				
				Without cascade effect*	With cascade effect**	
					derivatives	securities
Derivatives	**37.7**	**21.0**	–0.45	–0.0072[1]	(–0.072)[1]	(–4.4)[1]
equity linked	3.3	1.8		–0.04[2]	(–0.4)[2]	(–0.792)[2]
interest rate linked	29.6	16.5				
currency linked	4.8	2.7				
Total for securities and derivatives	**57.1**	**34.0**	**–0.73**	**–0.2872 –0.32**	**–4.752 –1.472**	

*FTT rate for derivatives 0.01%, for securities 0.1%
**FTT rate for derivatives 0.2%, for securities 2.2%
1) Impact of FTT on GDP based on the Marsden results.
2) Impact of FTT on GDP based on the Romer results.
Source: European Commission (2013), Impact Assessment and own processing

GDP in the value of –0.45 percent points of GDP based on the received tax revenues (see Tab. III above).

When the cascade effect is considered, then the impact of the FTT on GDP growth is worse. There is made an assumption that the cascade effect for derivatives will be designed similarly as in case of securities (see Fig. 2 above, effective FTT rate is 2.2%) i.e. lifetime effective FTT rate for investors is 0.2%. Therefore the impact of the FTT (in case of derivatives) on GDP growth is ranged between –0.072 and –0.4 percent points of GDP. Further, regards to the lifetime effective FTT rate 2.2% for investor in case of securities, GDP declines by roughly 4.4 percent points of GDP. Overall impact of the FTT considering cascade effects of securities (FTT rate 2.2%) and derivatives (FTT rate 0.2%) is after that **between –4.752 and 1.472 percent points of GDP** (see Tab. I above).

In the respect of cascade effect, the fiscal impact of the FTT and as well as on economic growth will be greater than the EU Commissions expects. The cascade effect as was proved (see Tab. I above) causes the worse impact on the GDP. Moreover it can be one of the reasons to relocate trade or business to another non-taxed or non-participated jurisdiction, or to substitute taxable securities/derivatives for non-taxable ones.

Regarding the **relocation effects** can be assumed that the relocation of business/trade can be in average **40%** based on the experiences of other states which implemented FTT in past. Reduction of trading affects negatively the long-run economic growth, thus the impact of the FTT on GDP as it is presented in Tab. I above can be worse. Further the relocation effect also causes a decline of expected tax revenues, specifically by almost of 13bn EUR (see Tab. IV below).

IV: *Relocation effects*

	Relocation in %	Weight factor	Assumed relocation	Tax revenues in EUR bn.[5]
Sweden	60	3	**40%**	**–13**
Germany	50	3		
Brazil[1]	100	1		
Switzerland[2]	100	1		
France[3]	9	5		
Italy[4]	30	5		

1) All foreign portfolio investments, foreign investors reallocated capital to New York.
2) The mutual fund business relocated to Luxemburg.
3) For 20 months since the FTT was introduced in France, the daily average turnover. Only stocks are considered.
4) For 12 months since the FTT was introduced in Italy, the daily average turnover. Only stocks are considered.
5) Tax revenue estimated for EU11.
Source: own processing

V: *International transaction in financial and insurance services versus all services: export, import and balance in EU*

Country	2008			2009			2010			2011		
	Net balance (in 1 000 million ECU/EUR)											
FTT-zone	fin	ins	all	fin	ins	all	fin	ins	all	fin	ins	all
Belgium	0.6	0.1	4.7	1.4	0.1	6.2	1.1	0	6.8	1.1	–0.1	3
Germany	3.9	0.2	–25.6	4.3	1.2	–16.6	4.2	1.4	–18	3.7	1.3	–22.7
Estonia	0	0	1.3	0	0	1.4	0	0	1.3	0	0	1.2
Greece	–0.1	–0.7	17.1	–0.1	–0.6	12.6	–0.2	–0.8	13.2	–0.2	–0.7	14.6
Spain	0.3	–0.5	25.8	–0.1	–0.3	25	–0.1	–0.7	27.5	0.2	–0.5	34.2
France	0	–0.8	16.5	0.3	0.6	18.3	0.7	0.5	15.9	2.1	1.6	24.2
Italy	–0.5	–1.3	–8.6	–1.5	–0.5	–8.4	–1.5	–1	–9.2	–1.8	–1.1	–7
Austria	0.6	0.2	14.2	0.5	0	12.7	0.5	0.1	13.2	0.6	–0.1	13.7
Portugal	0	–0.1	6.6	0	–0.1	6	–0.1	–0.1	6.7	–0.3	–0.1	7.7
Slovenia	0	0	1.4	0	0	1.2	0	0	1.3	0	0	1.4
Slovakia	–0.4	–0.1	–0.5	–0.2	–0.1	–1	–0.2	–0.2	–0.7	–0.1	–0.2	–0.4
EU27	31.7	4.5	71.3	27	11.7	83	29	12	103	29	7.3	121
EA17	10.2	–1.7	42.9	9.8	–0.8	44.6	13	–0.8	54.1	12	–0.4	67.2

fin – financial services, ins – insurance services, all – services
EU11is highlighted.
Source: Eurostat, National Account

In addition, based on the net balance of international transaction in insurance and financial services can be indicated **countries from FFT zone, which may relocate to a greater extent than the other, e.g. Germany, Austria, France and Belgium** (see Tab. V above). However, the extent of the relocation or the prediction of the type of financial institutions and its location and possible relocation outside FTT is uncertain.

It is surprising that the Commission does not take into account the cascade effect into consideration when estimating the adverse effect of the FTT on economic growth. As was proved there is significant adverse effect of it on the GDP growth, which can decline by roughly 4.7 percent points of GDP. Moreover, the increased cost of the cascade effect in the form of increased FTT burden will be passed onto the end customers who could react through a reallocation to non-taxable events or non-taxed jurisdiction, which could in turn dampen trading activity and economic growth.

Since DSGE model does not cover all the above mentioned factors, this model can be understood as a static model with underestimated results in case of negative impacts (mainly impact on GDP growth) and with overestimated results in case of positive impacts (e.g. revenue estimation). Thus the implementation of the FTT could have worse effects on GDP, than the Commission expected. Therefore, if the FTT is to be implemented, the negative impact on growth must be mitigated as far as possible in the whole EU28. This opinion is understandable as EU11 represent the critical mass of EU market, because four big continental economies, namely Germany, France, Spain and Italy are in. Further EU11 represent over 90% of the Eurozone economy (Eurozone creates assets in the value of 270% of GDP), comprise 2/3 of EU GDP and 1/6 of the global economy. In addition EU financial sector is more concentrated than in pre-crisis period. Thus it would be difficult not to serve and interact with this market (FTT market). However, there is no comprehensive assessment of FTT on non-participating Member States and its extraterritorial effects. The Commission's Impact Assessment includes no details about this issue.

Therefore at a time of fragile economic growth across the entire EU and the increased risk of recession in Europe, the imposition of the FTT through enhanced cooperation in EU11 could affect other EU Member States out of FTT zone and could have a substantial detrimental impact on EU GDP, which is undesirable.

DISCUSSION AND CONCLUSION

The introduction of the FTT bears a lot of negative consequences, for example a decrease in the future GDP and trading in financial markets, an increase in the cost of capital, change of the business structures, cascade effect and others; that outweigh over positives like as tax revenues. Further, there are divergent impacts on the participating and non-participating Member States. For instance, all EU Member States would benefit from the improvement of the internal market, as amongst EU11 would be used one approach to financial sector taxation, therefore simplifications and reduced administrative burdens for business, more transparency, less compliance costs and competitive distortions are expected. Non-participating Member States would benefit from the relocation outside of the FTT jurisdiction as their business without FTT would be more attractive than in participating Member States. However, there is no comprehensive assessment of FTT on non-participating Member States and extraterritorial effects. The Commission's Impact Assessment includes no details about this issue. As regards as objectives of the FTT, namely an elimination of potential undesirable market behaviour, ensuring of the functioning of the internal market and making another financial crash less likely; must be highlighted that there are a lot of concerns about FTT like as a suitable tool for achieving those aims. Moreover, what has to be highlighted that the FTT focuses on two counterproductive aims – fiscal and elimination of the potential undesirable market behaviour. In the respect of the first aim, it is possible to fulfil it by the general excise duties, e.g. by the FTT, as FTT is mainly considered as a tool for raising the tax revenue. However, in the respect of the second aim, it is generally fulfilled by selective excise duties. There is no doubt that there is unbalance in respect of the aims of the FTT. Even if the Impact Assessment (European Commission, 2013) states that the second aim is only "welcomed side effect" of the FTT introduction.

In addition, the results based on the Commission's model (DSGE) can be considered as an underestimated in case of the impact on economic growth, and an overestimated in case of the revenue collection, because this model did not factor-in the full impact. Particularly the model did not take into account the tax on derivatives, relocation effects and capital migration, cascade effect, imposition of the FTT on the both sides of transaction, and others. Moreover, accordingly to the current and past experiences, impacts of the FTT on economy can be worse. Based on our assumption, the overall impact of the FTT considering cascade effects of securities (FTT rate 2.2%) and derivatives (FTT rate 0.2%) is ranged **between –4.752 and 1.472 percent points of GDP**. And further, is assumed that the **relocation effects** of business/trade can be in average **40%,** causes a decline of expected tax revenues in the amount of 13bn EUR. Thus, at a time of fragile economic growth across the EU and the increased risk of recession in Europe, the introduction of the FTT should be undesirable.

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