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Fiscal and Economic Impacts of a Limited Financial Transaction Tax

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Fiscal and economic impacts of a limited financial transaction tax**

Final report

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Executive Summary

- The present study examines the effects of the introduction of a financial transaction tax along with enhanced cooperation across 11 European Union member states. In particular, based on the tax concept of the European Commission, the tax revenues for four participating countries, Germany, France, Italy, and Austria, are estimated.
- The cross-border financial transaction tax (FTT) is of fundamental importance to the European Union. With the FTS, it is hoped to establish a model of enhanced cooperation across the fiscal area, to generate substantial fiscal revenues, to adequately share the cost of the crisis with the financial sector, and to contribute to the prevention of future crises.
- France and Italy introduced in 2012 and 2013, respectively, their own models of the FTT. The overall review of the available empirical evidence on the impact of those FTT-models does not allow a clear conclusion. The studies find mostly a decline in trading volume, but the findings are strongly dependent on the selected control group for the taxed firms, and the duration of the observation period. A study of the tax elasticity suggests that the limited tax bases invite traders to avoid taxes by switching from taxed to non-taxed financial instruments.
- The estimation of the tax revenues for four EU countries is at the core of this study. The results of the first estimation reveal that a FTT with a broad tax base can provide substantial revenues. The obtained revenue for Germany ranges from 18 to over 44 billion EUR, if the tax is collected on the basis of both residence principle and issuance principle, and the tax rate is 0,1 percent for securities and 0,01 percent for derivatives.[1] France's tax revenue varies from about 14 to about 36 billion EUR. The estimated volume for Italy is between 3 and 6 billion EUR. Austria could expect revenues between 700 million and about 1.5 billion EUR.
- If the tax base is broad, considerable revenues can still be achieved even if the rates are lowered. In case of a uniform tax rate of 0,01 percent for both derivatives and securities, the estimated revenue for Germany is between nine and about 34 billion EUR.
- If the secondary markets for government bonds are not taxed, the forecast for the revenue is considerably lower. Germany's volume is then between 11 and about 36 billion EUR. France can expect revenue ranging from about 10 to 30 billion EUR. Italy's reve-

[1] It should be noted that throughout this text, a period (.) is used within a number to separate 000, while a comma (,) serves as the decimal mark.

nues are between 2 and about 5 billion EUR. Austria can expect revenues between a half and slightly over one billion EUR.

- Likewise, a waiver of the residence principle would strongly restrict the fiscal yield of a financial transaction tax. Italy and Austria would be particularly affected. While France and Germany would lose about thirty percent of the estimated income, Austria would lose more than three-quarters of its forecasted revenue. Therefore, smaller countries may be disproportionately affected if the residence principle was dropped and the FTT was collected on the basis of the issuance principle only.
- Derivatives make up most of the tax base. If exempted, most of the potential revenue from FTT is lost. Germany and France could lose about 90 percent of the revenues.
- In addition, exemption of derivatives encourages traders to circumvent the tax through instrument arbitrage. The likely consequence is a strong erosion of the tax base in the taxable segment. Therefore, a model that stages the introduction of the FTT and leaves the derivatives exempt in the first stage seems to be unsuitable for achieving the objectives of the FTT.
- Data on how certain types of traders (banks, hedge funds, insurance companies, etc.) are affected by the FTT are scarce. In the segment of over-the-counter derivatives “reporting banks” of the Bank for International Settlements and “other financial institutions" appear to be affected in particular. In contrast “non-financial institutions” seem to be rarely affected. Even such rather rough assessment is not possible for exchanges. The required data on counterparties are not available.
- Measures to improve the financial transaction data are urgently needed. The breakdown of publicly available turnover data by stock exchange, financial instrument’s country of issuance, and residency of the counterparties would be particularly helpful in calculating the consequences of the FTT.

1 Objectives and structure of the study

On September 28, 2011 the EU Commission presented an initial proposal for a common system of financial transaction tax (FTT) for all 27 EU member states (European Commission 2011). In the EU Commission's proposal, the FTT is based on a broad tax base and comprises essentially all business transactions in the secondary markets. Direct financial transactions, however—such as corporate and consumer lending and the issue of shares—would be exempt from taxation. Using transaction data from 2010, the Commission estimated the EU-wide tax revenue to be 57 billion EUR. In 2012, the European Parliament and several committees, including the Economic and Social Committee, approved the proposal; however, no consensus was reached among all EU countries regarding its implementation.

In response, the Commission published a proposal for a directive in February 2013, which called for enhanced cooperation across eleven EU countries with regard to the financial transaction tax. Since the submission of the proposal, the eleven states have been negotiating the exact configuration of the common financial transaction tax. Fiscal revenue and incentive effects are critically dependent on the width of the tax base, the level of the tax rates, and the principle of taxation. As of yet, no consensus has been reached on these key elements.

Against this background, this study aims to estimate the fiscal and economic effects of a limited financial transaction tax (FTT), in which the two principles of taxation—residence principle and issuance principle—are taken into account. In particular, the study examines the consequences of excluding certain financial instruments, or groups of financial instruments, from the tax base. As well, the effect of varying tax rates on tax revenue is investigated.

In making this assessment, the study considers the experiences with the effects of the French and Italian FTTs, and identifies and factors in possible behavioral adaptations of the market participants. Furthermore, it evaluates the so-called "phase model" that would be used to stage the introduction of an FTT—a model that is theoretically comprehensive, but ultimately limited in practice. (According to the phase model, certain financial instruments—or groups of instruments—would initially have a tax rate of zero.) Finally, the study examines the effects of the financial transaction tax on different market participants.

The tax revenues are quantified for Germany, France, Italy, and Austria. The comparison of these four countries gives, among other things, an indication of how tax revenues and effects would be distributed among the larger and smaller countries.

2 The unified FTT is of fundamental importance

The transnational financial transaction tax is of fundamental importance for the European Union—and even beyond its borders. Its implementation could lead to a breakthrough on several levels.

2.1 … establishes enhanced cooperation in the fiscal area

The eleven states involved—Belgium, Germany, Estonia, France, Greece, Italy, Austria, Portugal, Slovakia, Slovenia, and Spain—have entrusted the EU Commission with developing a proposal for enhanced cooperation with regard to the financial transaction tax. In February 2013, the Commission generated a corresponding proposal for a directive for the tax area comprising these eleven states. Purpose and scope are consistent with the original proposal that applied to all EU countries; the aim is to establish the basis for a harmonized FTT in order to counteract the fragmentation of the internal market in the area of capital movements.

To date, ten countries in the EU have imposed a financial transaction tax. A few of those countries, including Italy and France, have only recently (re)introduced the tax. The structure of the FTT differs from country to country. These individual solutions are constraining the free movement of capital within the EU.

The proposal for a directive for enhanced cooperation involves imposing a tax rate of 0,1 percent per party[2]—that is, both the buyer and the seller—in securities trading (essentially, stocks and bonds); here, the tax basis is the transaction price. Derivative contracts are taxed based on the nominal value, which is often the value of the underlying security. The proposed tax rate in this instance is 0,01 percent.

The transaction partners are jointly and severally liable for the tax payment. If only one of the parties is taxable, it will bear the entire tax burden. Given the possibility of sharing the tax burden, there is incentive for parties within the tax area to encourage their trading partners to register in the tax area as well. The goal of creating the broadest possible tax base, as outlined

[2] It should be noted that throughout this text, a period (.) is used within a number to separate 000, while a comma (,) serves as the decimal mark.

in the original proposal, is also included in the Commission's updated proposal. Securities trading will be subject to taxation jointly with derivatives transactions so as to prevent tax arbitrage among financial instruments as much as possible.

Tax avoidance through a relocation of activities is greatly limited by a combination of residence principle and issuance principle. All transactions carried out by financial institutions located in the tax area (residence principle) and all transactions made using instruments that were issued in the tax area (issuance principle) will be taxed. Tax collection should give priority to the residence principle, as the country in which the financial institution is located was usually the one to supply rescue funds had there been difficulties in the past (EU Commission 2013b). In addition, according to the Commission's proposal for enhanced cooperation (EU Commission 2013b), the principle of "substance over form" should be applied in order to prevent legal circumvention through the use of special constructs.

One of the legal constructs used to minimize taxes is so-called margin trading. Here, a derivative is constructed that causes a gain through an upward movement of an underlying security (stocks or bonds) and a loss through a declining share price. The owner of the derivative takes part in the performance of the financial instrument without owning the stock or bond. If the "substance over form" principle is effective here, the higher tax rate applied to securities would still be imposed.

Like the original proposal, the FTT concept for enhanced cooperation excludes all primary activities, including everyday banking transactions, among others. Accordingly, demand or time deposits in banks are not taxed, nor are loans to businesses, households, and governments or the issuance of stocks and bonds. All transactions between customers and life insurance companies are also excluded (Schäfer 2013c). Since the proposal for the unified financial transaction tax was submitted, the members of the tax area have been negotiating its exact configuration.

Several obstacles have been getting in the way of negotiations. The EU Commission is not authorized to organize the negotiation process of an enhanced cooperation in which only a subset of EU countries is involved: It has no say in the matter, nor can it provide protocol or administrative support. On the level of content, the premature implementation in France and Italy of national FTTs with more or less limited tax bases has also been a hindrance. Both countries have long been negotiating toward a solution that draws as much as possible from their respective individualized concepts. This intention is reflected in French Minister of Fi-

nance Michel Sapin's proposal from the beginning of November 2014, which stipulates that only the trading of stocks and credit default swaps should be taxed (Sapin 2014).

At the end of 2014, the French government backed away from this stripped-down solution. Since then, France and Austria have launched a joint initiative to make a broad tax base and low tax rates the basis for further negotiation processes. Concurrently, the negotiation process among the eleven countries is being restructured. Portugal will serve as the secretariat, providing administrative support and guidance to the negotiation process. Austria will preside over future rounds of negotiations and lead the political coordination.

The outcome of these negotiations has overriding importance for the EU, and is widely regarded as the jumping-off point for further agreements of enhanced cooperation with regard to taxes. This is connected to the hope of sooner or later establishing more tax harmonization in the EU. If this limited level of enhanced cooperation is successful, there is a high likelihood of other EU countries joining the system.

2.2 … creates much-needed fiscal space

The creation of fiscal space in the tax area is necessary for several reasons. Germany has passed a budget plan for 2015 that does not involve the creation of any new debt—the first time it has done so in 40 years. At the same time, there are plans to reduce "bracket creep" in the coming years to strengthen the purchasing power of the population. If a balanced budget is nevertheless to be maintained for the coming years, the resulting drop in revenue must be refinanced. The FTT can make a substantial contribution to this. It could also contribute to a more equitable distribution of the tax burden between the production factors of labor and capital. Because the tax has less of an effect on lower and middle-income segments than it does on higher-income segments (Schäfer 2013c), undesirable distributional effects are unlikely.

Germany's favorable budget situation is due in large part to the historically low interest rates. In 2013, slightly more than 59 billion EUR in interest had to be paid on the debt of the public sector. This corresponds to an average interest rate of only 2,75 percent.[3] Due to the planned reduction of the pay-as-you-go (state) pension levels, the funded pension pillar will become more important in the future. Higher interest rates would therefore be desirable, at least in the medium term. But without massive cuts in spending, the state can only afford to pay higher interest rates by creating the necessary fiscal space through additional revenue (Kokert,

[3] Own calculations based on Eurostat, www.ec.europa.eu/eurostat.

Schäfer und Stephan 2014). Even a one percent increase in the average interest rate on the outstanding debt would cost Germany more than 20 billion EUR in additional interest.

In Europe, investments need to be higher than they have been in previous years in order to preserve existing infrastructure and create new infrastructure. Productivity-enhancing investments seem to be necessary as well so as to restimulate, in the medium to long term, the currently weak growth. Such an investment offensive would be accompanied by growing expenditure within the public sector. Increasing flows of refugees and the cost of an intensified fight against climate change are other factors that will be reflected on the expenditure side of the state budget. If the balanced budget amendment is adhered to, additional revenues will be required in the coming years.

The FTT is of great importance to countries with debt problems, such as France and Italy, especially in relation to a gentle and socially responsible fiscal consolidation. France's annual budget deficit is still at about 4 percent of the GDP. Italy, due to the ongoing recession, is at risk of violating the Maastricht criteria, which limit a maximum new debt to 3 percent of GDP. A further reduction of public spending would probably have a negative impact on the already weak growth and exacerbate the social problems in these countries (e.g., Semmler, Semmler and Schroder 2013, DeGrauwe and Ji 2013).

Revenues from the financial transaction tax could help to overcome this dilemma. Of course, this requires sufficient fiscal efficiency, which exists in neither the French nor the Italian models of the FTT; the very limited tax bases of the F-FTT and I-FTT only generate relatively low revenues.

2.3 … establishes a price for the public good “financial stability”

To stabilize the financial markets during the acute crisis, the EU Commission for Financial Institutions authorized 4,500 billion EUR in state aid (EU Commission 2012). This is equal to about 37% of the EU GDP. Although the actual costs of the crisis account for only part of this aid, the EU Commission assumes that these costs are nevertheless equal to around 15–20 percent of the EU GDP.

The FTT can be economically justified by virtue of financial market stability being a public good. If one interprets the trading of financial instruments as a utilization of this public good, the FTT can be viewed as the price for this usage. According to the polluter pays principle, the financial transaction tax would consequently contribute to internalizing the costs of this usage.

In this way, it counteracts the overexploitation and collapse of the system (Schäfer et al, 2012, Schäfer 2013a).[4]

The taxation of transactions promotes long-term orientation and transparency. The tax applies if the funds are put into financial instruments that are traded on secondary markets; according to the Commission's proposal, it does not apply if the funds are used for financing the real economy. The tax burden is high if the financial instrument is frequently traded, but low in the case of long-term investments. These attributes are basic components of a sustainable and stable financial sector (Schäfer 2013b).

3 National FTT solutions fall short of expectations

3.1 The French financial transaction tax

The French financial transaction tax (F-FTT) has been in effect since August 1, 2012. The F-FTT applies to stock trading if:

- The issuing company is headquartered in France.
- The company has a minimum market capitalization of 1 billion EUR.
- Transfer of ownership in return for payment takes place.

At the end of the trading day, only the net position is taxed. If the security is bought and sold on the same day, no taxation applies.

In securities transactions, buyers must pay a tax of 0,2% per transaction, regardless of their location or nationality or the origin of the order. OTC trading is taxed if the traded instrument is also traded at the stock exchange and is itself taxable.

For high-frequency trading (HFT), a tax of 0,01% is applied to all cancellations or modifications of any transaction within half a second, regardless of origin or volume, if the order change exceeds a certain cut-off point (80%).[5] The HFT tax applies only to resident taxpayers (Europe-

[4] Darvas and von Weizsäcker (2011) view the aspect of correction of market failures as, in fact, the central motive for introducing the tax: "Financial-transaction taxes should not be introduced with the primary objective of raising revenue. However, there could be a case for a small financial transaction tax if financial transactions cause negative external effects that need to be internalised" (p. 9). The authors also do not see the financial transaction tax as an alternative to financial market regulation, but rather as a complement to it: "Therefore, transaction taxes may be justified given the uncertainties about future regulatory problems. And they might, from time to time, even be able to give regulators a little more time to think about the holes to be plugged" (p.10).

[5] The cancellation rate is calculated by dividing two sums. The numerator is the sum of the nominal amounts of cancellations and change orders, and the denominator is the sum of the nominal amounts of initial orders and change orders

an Commission 2013c).

In the case of derivatives, only naked credit default swaps whose underlying is based in an EU country and has been bought by French resident taxpayers are taxed. For these, a tax of 0,01% on the nominal value is in effect. Market making is exempt from this tax.

In 2012, 109 companies fell under the tax (Coelho 2014). American Depositary Receipts (ADRs) were initially not included, but trade in these securities became taxable in December 2012. These ADRs are derivatives of French shares that have been issued by U.S. banks. They make it possible to trade French shares within the U.S. without exposing the dealer to foreign exchange risk and French trading fees. The corresponding shares are deposited with the French partner bank of the American institute that issued the ADR.

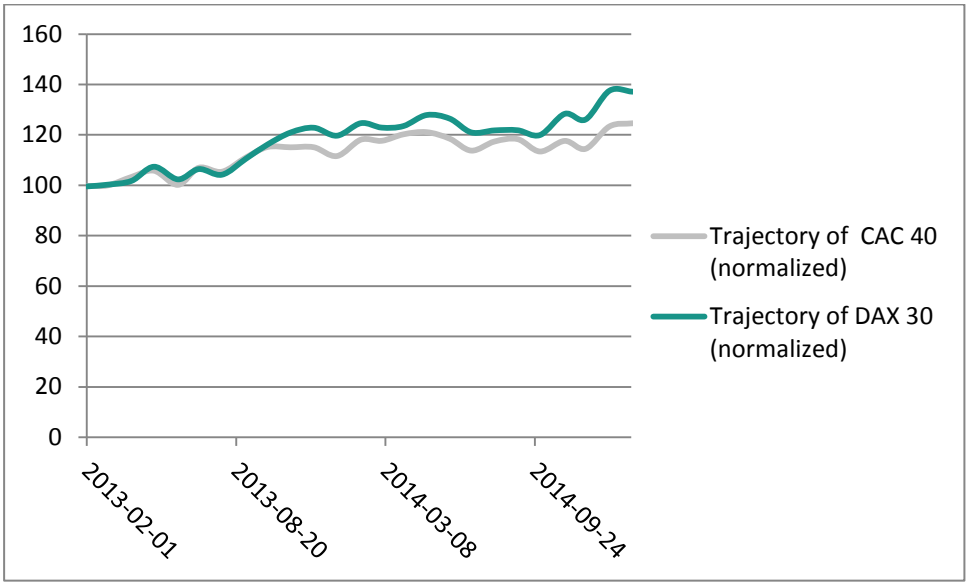
Revenue from the F-FTT amounted to 200 million EUR in the second half of 2012. In 2013, it amounted to EUR 700 million.[6] In 2012, 99,5% came from share trading and 0,5 percent came from unfunded credit insurance. None of the revenues in 2012 came from high-frequency trading (Capelle-Blancard und Havrylchyk 2013).

Figure 3-1 depicts the trajectory of the benchmark French stock market index CAC 40 (gray line) compared to the German stock market index DAX 30 (green line) over the past two years. Thirty-five companies from the CAC 40 are subject to the tax. The values of the indices in February 2013 were both normalized to 100.

(Sauckel 2014). For example, if the average price of a security (calculated over the course of one trading day) is 50 EUR and the first order of 100.000 securities comprises 85.000 cancellations and 1.000 changes, the result is a cancellation rate of (85.000 + 1.000) / (100.000 + 1.000) = 85,14 percent. Hence the tax of 26 EUR is calculated as follows: ((85.000 + 1.000) - (100.000. +1.000) * 0,8) * 50 EUR * 0,01% = 26 EUR (Sauckel 2014).

[6] The data are not consistent here. Capelle-Blancard and Havrylchyk (2013) mention 200 million EUR, whereas the OECD mentions 245 million EUR for 2012 and 697 million EUR for 2013 (OECD 2013). Even the details of the original estimates for 2012 and 2013 are inconsistent. They range from 170 million EUR for 2012 and 500 million EUR for the subsequent years (Meyer et al, 2013), up to 530 million EUR (2012) and 800 million EUR (2013) (Capelle-Blancard and Havrylchyk 2013).

Figure 3-1
Trajectory of CAC 40 and DAX 30 in the last two years[a]



[a]The basis is the value of the indices on February 2013. The values of the indices on February 2013 were both normalized to 100.
Source: Calculations of DIW Berlin on the basis of data from Euronext and Frankfurter Börse.

It is evident that the French stock market index has seen weaker development than its German counterpart. However, there could be many causes for this. For example, the unemployment rate in Germany decreased between 2012 and 2014, whereas it increased in France between 2012 and 2013. In 2014, France's unemployment rate, at 10,2 percent, was more than twice as high as Germany's rate of 5%.

Because there are a number of possible causes, studies on the impact of the F-FTT usually draw on a statistical method in which the trading of shares of the taxed firms is compared with the trading of shares of "similar" but untaxed companies (Difference-in-Differences estimation method). This approach aims to isolate the effect of the FTT from other factors (e.g., unemployment, weak growth, etc.) so it can be identified. The non-taxable control groups used for this purpose differ from study to study; they range from German DAX companies, to Belgian and Dutch companies, to non-taxable French companies below the market capitalization threshold. The duration of the observation periods also differs; here, it ranges from the period between 10 days before and after the introduction of the F-FTT, to more than one year.

The impact analysis generally focuses on three factors: trading volume, extent of the price fluctuations (volatility), and impact on the bid-ask spread and prices in general, respectively.[7] Only one study focuses on tax avoidance through circumvention and examines the elasticities. A tabular summary of the studies can be found in the appendix.

In some studies, a high trading volume is viewed as an indicator of high liquidity in the market. It is generally believed that under high liquidity, it is easy for a seller to find a buyer at the desired price. Understood in this way, a high level of liquidity is beneficial because it enhances the welfare of a market. Whether the probability of finding a counterparty willing to pay the desired price bears a high correlation with the trading volume is theoretically and empirically unresolved. A high trading volume may also point to undesirable behaviors in terms of welfare economics. An example of this is when high-frequency traders snap up shares at low prices due to rapid market access and sell them at slightly higher prices within a split second. Apparently, a "suitable" counterparty was already available at the desired (higher) price of the original sales offer. Thus through the intervention of the HFT no new liquidity has been created, although compared to a situation without intermediary HFT, the trading volume has doubled and the wealth position of the selling party has diminished.

The comparative analyses of the trading volume show varying results (see Appendix). The EU Commission's analysis of the period between August 2011 and January 2013 determined that the trading volume of the non-taxed German DAX companies experienced a stronger decrease than did the volume of all taxable French companies. The decline in the German DAX companies' turnover of shares, however, is less pronounced than the decline in the taxable CAC 40 companies' turnover of shares (EU Commission 2013c).

Haferkorn and Zimmermann (2013) analyzed the taxable CAC 40 companies and the (non-taxed) DAX 30 companies over a period of 10 and 40 days before and after the introduction of the F-FTT. They identified a statistically significant decrease in the number of transactions of French companies relative to the German control group, but no statistically significant decrease in the volume of trade. Other studies using varying control groups have shown a relative

[7] The bid-ask spread is the difference between the lowest price for the security that someone is willing to offer (best offer) and the highest price at which someone is willing to spend money, that is to purchase, the security (best bid price). The smaller the difference between the two rates, the more liquid the stock is said to be.

decline in the taxable French companies' turnover of shares.

The vast majority of F-FTT studies have identified sharp declines in the trading volume and the number of transactions in taxable French securities right after the introduction of the F-FTT. However, it is also apparent that the decline is weaker if longer periods after the introduction are included.

Table 3-1 shows higher sales growth for the CAC 40 in the period between February 11, 2014 and February 10, 2015 compared to the same period from the previous year, than it does for the DAX 30. This suggests that the more short-term empirical studies comparing the impact of F-FTT on the trading volumes should be supplemented by longer-term analyses.

To what extent the observable decline can be explained by traders switching to non-taxable derivatives is usually not addressed. However, anecdotal evidence suggests that at the very least, the transaction volume of so-called contracts for difference increased after the introduction of the F-FTT.[8]

Almost all empirical studies come to the conclusion that the FTT has no effect on price fluctuations (volatility). An exception is the study by Becchetti et al. (2013). The authors identified a statistically significantly smaller intraday volatility (difference between the daily highest and lowest prices) in the share trading of the taxable French companies than in that of the control group of non-taxed French companies.[9]

The findings regarding the bid-ask spread—which is often used as a gauge of liquidity—likewise show almost no change resulting from the F-FTT against the control group. However, Haferkorn and Zimmermann (2013) have come to the conclusion that the bid-ask spread in the stock trading of the taxed French CAC 40 companies has worsened in comparison to the German control group. They have also found a reduced order book depth.

[8] "But Pierre-Antoine Dusoulier, Saxo Bank's head of Western Europe, noted a 20 percent rise in French CFD volumes in the first quarter." Reuters: CORRECTED-Impact of trading taxes seen in declining French, Italian stock turnover http://uk.reuters.com/article/2013/08/02/markets-stocks-tax-idUKL6N0G04TE20130802 (See also: Hannig und Schweinitz 2015).

[9] The depth of the order book indicates the size of an order that is necessary to move the price. If the order book is very deep, it needs large orders for a price movement. At shallow depths, the price can be changed even by small purchase or sales orders. A large order book depth is considered desirable because it makes targeted price manipulation difficult and works against price jumps.

Only one study dealt explicitly with the avoidance responses of market participants. The elasticities discovered point to partially strong avoidance responses. The author believes this is caused by the very limited tax base (Coelho 2014), which opens up many possibilities to switch to non-taxable instruments.

Table 3-1
Development of sales of the CAC 40 and DAX 30 in the last two years

Index	February 11, 2013 to February 10, .2015	February 11, 2013 to February 10, .2015
Turnover CAC 40 (billions of EUR)	726,8	872,2
Turnover growth CAC 40		**20%**
Turnover DAX 30	773,73	846,56
Turnover growth DAX 30		**9%**

Source: Calculations of DIW Berlin on the basis of data from Euronext and Frankfurter Börse, https://indices.Euronext.com/en/products/indices/FR0003500008-XPAR/quotes,http://www.boerse-frankfurt.de/de/aktien/indizes/dax+DE0008469008/kurs_und_umsatzhistorie

3.2 The Italian financial transaction tax

The Italian financial transaction tax (I-FTT) applies to stock trading, including any certificates derived therefrom, if:

- The issuing company is based in Italy.
- The company has a minimum market capitalization of 500 million EUR.
- Transfer of ownership in return for payment takes place.

In securities transactions, the buyer pays a tax of 0,1% (2012) or 0,12% (2013) of the transaction volume at regular stock markets and multilateral trading facilities, and 0,2% (2012) or 0,22% (2013) on an OTC trade. This tax applies regardless of the location or nationality of the buyer or the origin of the order. As in the case of the F-FTT, only the net position at the end of a trading day is taxed.

In high-frequency trading, 0,02% is charged on all modifications and cancellations in the event that the percentage of the order change exceeds a certain cut-off point (60%) in a given

timespan. The transaction must be carried out in Italy. The tax liability lies with the commissioning institution.

All derivatives on stocks and other financial products that are subject to the tax are, depending on the type of derivative and its nominal value, taxed at different fixed amounts:

- on a sliding scale according to transaction volume, not exceeding 200 EUR (per trading partner) for OTC transactions with a nominal value of more than 1 million EUR,
- a reduced tax rate of 20 percent of the OTC derivatives rate if the transaction is carried out at a regulated market or a multilateral trading facility.

Pension funds are exempt from the tax. Market making is taxed to a great extent. The tax revenues in 2012 amounted to 200 million EUR; the value was initially estimated to be 1 billion EUR.[10]

With the exception of Coelho's study on trade at the Milan Stock Exchange (2014), the impact of the I-FTT has rarely been examined empirically until now. At the Milan Stock Exchange, there has been no decline in trading volume following the introduction of the I-FTT. No significant change in volatility has been detected compared to the control group (Spanish companies). However, the elasticities found suggest avoidance responses. For example, OTC trading in the taxable Italian securities has decreased relative to the control group. Coelho (2014) attributes this to Italy having on OTC trade twice the tax rate.

Overall, the empirical evidence on the effects of the French and Italian FTTs does not lead to any clear conclusions about the impact of a financial transaction tax on trading activity. For the most part, it indicates a decline in trading volume, but this finding—as shown in the EU Commission study, among others—is greatly dependent on the selected control group and the observation period. The findings related to the elasticities, however, indicate that due to the avoidance responses they provoke, stripped-down solutions for the tax base are not advisable.

[10] This number can be found in Coelho (2014), for example.

4 Calculating turnover using a multiple-step process

According to the EU's proposal for a Directive, the taxable turnover for each country is made up of two components. The first component results from the residence principle, and includes all turnover generated by traders who reside within the country under observation, regardless of which financial instrument was traded. The second component results from the issuance principle—that is, turnover from financial instruments that were issued in the country under observation. In this instance, the location of the transaction and the nationality of the trading partners play no role in determining tax liability. Since no country-specific data are available on which turnover is attributable to the trading of domestic financial instruments by traders from other countries, information on the taxable trade under the terms of residence principle and issuance principle must be derived using an appropriate method.

The eleven countries that have all agreed on joint collaboration comprise the tax area. Other countries both within and outside the EU are considered part of the "non-tax area." Under the terms of the residence principle, all trading parties based in the tax area are taxed, even if they trade a financial instrument that was not issued in the tax area. Thus, a German bank that trades a French share in Paris with a French partner institute is taxed in the same way as a German bank that trades an English share with a U.S. counterparty in London. At the same time, the tax revenue for the home country—in the preceding examples, Germany—depends on whether the counterparty is also headquartered in the tax area. If the two parties are located in two different countries within the tax area, the home country under observation receives half of the tax revenue, while the other half goes to the counterparty's home country. If the counterparty is located in the non-tax area, however, the home country under observation receives all tax revenue.

4.1 ... combines residence principle and issuance principle

The method used to calculate turnover under the terms of residence principle and issuance principle follows Copenhagen Economics (2014), and consists of several stages. In the first stage, turnover attributable to the residence principle is calculated by determining the proportion of the other countries' stocks and bonds portfolio that is retained by actors residing in the home country under observation. In the second stage—assuming the proportions of the port-

folio correspond to that of the total sales—the turnover proportion attributed to the country of residence ("home country") is calculated.

Table 4-1
Principle of the calculation of tax base and tax revenue according to residence principle

The table below illustrates the procedure described above according to residence principle. The country under observation ("home country") is denoted here by Y. Country X is any foreign state from the tax area.

Starting point					
Market capitalization of stocks in country X	**Share turnover in country X**	**Investment of country Y in the stocks of country X (5 %)**	**Investment of non-tax area in the stocks of X (20%)**	**Investment of country X and other countries in the tax area in the stocks of country X (75 %)**	**Country Y's attributable turnover share of the trade with stocks from country X (5%)**
2.000	**2.200**	**100**	**400**	**1.500**	**110**
Calculation principle					
		… the home country (Y)	**… the non-tax area**	**… the tax area (excluding the home country Y)**	
Sales attributable to a counterparty from Y trading with a counterparty from … …		**0,05 x 110 =5,5**	**0,2 x 110 =22**	**0,75 x 110 =82,5**	
Tax base for calculating the tax revenue		**5,5**	**22**	**0,5 x 82,5**	

Source: DIW Berlin

In the case of derivatives, there are no data available on individual countries' usage of domestically issued derivative financial instruments. Therefore, the determined turnover proportions

for stocks and bonds are used for derivatives as well. For stock-related derivatives, the stock market proportions are used, while the turnover from bond-related derivatives is attributed to the individual countries by using the calculated bond market shares.

Table 4-2
Principle of the calculation of tax base and tax revenue according to issuance principle

The table below illustrates the procedure for the calculation according to issuance principle.

Starting point				
Market capitalization of shares of the country under observation (issuing country)	**Sales of shares issued in the country under observation**	**Local investment: Local share of the market capitalization of the country under observation (66,66 %)[a]**	**Investment of non-tax area in the shares issued by the country under observation (10 %)**	**Investment of the tax area in the shares issued by the country under observation (23,33 %)**
3.000	**4.400**	**2.000**	**300**	**700**

Calculation principle				
		… the country under observation	**… the non-tax area**	**… the tax area**
Sales attributable to a local counterparty trading with a counterparty from …		**0,666 x 0,666 x 4.400 = 1.955,6** (Tax base belonging to the country under observation: 1.955,6)	**0,666 x 0,1 x 4.400 = 293,3** (Tax base belonging to the country under observation: 293,3)	**0,666 x 0,233 x 4.400 = 684,4** (Tax base belonging to the country under observation: 0,5 x 684,4)

It should be noted that throughout this text, a period (.) is used within a number to separate 000, while a comma (,) serves as the decimal mark.

Source: DIW Berlin

In the third stage, it is determined whether the resulting turnover proportion can be attributed to trade with another domestic counterparty (1); with a non-domestic counterparty from the tax area (2); or with a counterparty from the non-tax area (3). When traders from home countries trade with counterparties from another country within the tax area, only half of the reve-

nue remains in the home country (Table 4-1). Thus in case (2), only half of the attributable turnover is multiplied by the full tax rates of 0,2 percent or 0,02 percent, respectively. This procedure is used for each of the home countries under observation.

In a similar way, the relevant turnover under the terms of the issuance principle is ascribed to the individual countries (Table 4-2) (See also: Copenhagen Economics 2014, Appendix). First, the proportion of the market capitalization of the domestic financial instrument is determined for the three relevant groups. The three groups are: (1) trading parties from the issuing country under observation; (2) trading parties from another country within the tax area; and (3) trading partners from the non-tax area. Under the assumption that the proportion of market capitalization corresponds to the proportion of the turnover, we can use these proportions to determine the probabilities of a trading party from the issuing country encountering a counterparty from one of these three groups. To determine the taxable turnover for each country under observation, the total turnover of the domestic financial instrument is weighted with the probabilities of the occurrence of a specific composition of the trading parties. It should be noted, though, that due to the dominance of the residence principle, the issuing country under observation does not receive any tax revenue in two cases. If the trade takes place between a party from another country in the tax area and a counterparty from the non-tax area, the issuing country under observation comes out empty-handed. The same applies if the transaction is carried out between two parties from other countries within the tax area. However, when two parties from the non-tax area conduct the trade, the issuing country collects the entire tax revenue.[11]

The revenue of the four countries under observation is estimated based on 17 financial instruments. Here, three different scenarios are considered. In the first scenario, the revenue is calculated using the data set from the Commission's estimates. The EU impact study performs an a priori turnover correction with the factor of 0,85, which accounts for the fact that only 85 percent of turnover is generated within the financial sector. We maintain this correction throughout this study. Tax avoidance is established by using a deduction (factor of evasion) on

[11] The corresponding probabilities for the occurrence of this composition of the two counterparties of the trade may be calculated using the same procedure as is used in the cases shown in Table 4-1 and Table 4-2.

the outstanding market and nominal values. In the Commission's original estimate, it was calculated at 15% for securities and 75% for derivatives (EU Commission 2011b).[12] This scenario is referred to within our study as the "maximum evasion scenario." The second scenario assumes no evasion on the markets at all. The third scenario is calculated with an evasion of 50 percent in the case of derivatives. We refer to this scenario as "the moderate scenario."

The revenue is estimated according to the EU Commission's calculation formula,[13] which uses the total tax rates for both parties: 0,02 percent for derivatives and 0,2 percent for securities. The division of tax revenues between two countries in the tax area is calculated by cutting the tax base in half.

Table 4-3
Transaction costs per financial instrument according to the EU impact study

Financial instrument	Transaction costs (share of market/nominal value)
Stocks	0,006
Bonds	0,006
Exchange-traded derivatives	0,003
OTC-interest rate derivatives	0,007
OTC-foreign exchange derivatives	0,00024
Credit default swaps CDS	0,007

The comma (,) serves as the decimal mark.

Source: European Commission (2011), Impact Assessment

[12] In the EU Commission's original estimate there are different data on the extent of evasion and avoidance (Evasion E). The values used here in the so-called maximum scenario were provided to the author of this study in 2012 by a representative of the Department of Indirect Taxation and Tax Administration, DG TAXUD, as those on which the revenue estimate of 57 billion EUR for all EU countries is based. The impact study from 2011 examines various evasion configurations without focusing entirely on any one configuration. See also European Commission (2011b), http://ec.EURpa.eu/taxation_customs/taxation/other_taxes/financial_sector/index_en.htm .

[13] The formula for calculating the tax revenue is as follows: $\mathbf{R=2t\ U\ f\ (1-E)(1+2t/c)^{\varepsilon}}$. *R* is the tax revenue, *U* is the taxable turnover, *f* is the portion that is attributable to the trading of financial institutions, *t* is the simple tax rate, *E* is the percentage of the gross sales that may no longer take place after the tax is introduced (=evasion), and *c* represents the transaction costs on a decimal basis. Tax elasticity is represented by ε.

As the calculation formula requires data on transaction costs, we employ the same data as were used in the EU Commission's impact study (Table 4-3).

The tax elasticity reflects the deterioration of the tax base, which is directly linked to a percentage increase of the tax rate. As in the EU revenue estimate, calculations are carried out with elasticities of -1 for securities, -1,5 for non-currency derivatives, and -2 for currency derivatives. The calculation parameters for the basic estimates are summarized in Table 4-4.

Table 4-4
Calculation parameters for the estimate[a]

Group of instruments	Tax rate for each counter-party	Elasticity	Scenario 1: Maximum evasion	Scenario 2: No evasion	Scenario 3: Moderate evasion
Securities (bonds and stocks)	0,10%	-1	15%	0%	0%
Derivatives excluding foreign exchange derivatives	0,01%	-1,5	75%	0%	50%
Foreign exchange derivatives	0,01%	-2	75%	0%	50%

The comma (,) serves as decimal mark. Source: DIW Berlin

France and Austria's joint initiative explicitly aims to create a broad tax base with "small" tax rates. Tax rates that are lower than those in the Commission's proposal will therefore play a greater role in future negotiations on enhanced cooperation than they have in the past. To account for this, the revenue from lower tax rates is also estimated (Table 4-5).

Table 4-5
Other tax rates

Group of instruments	Tax rates as proposed by the EU Commission	Variations		
Securities (bonds and stocks)	0,10%	0,05%	0,01%	0,05%
Derivatives	0,01%	0,005%	0,001%	0,001%

The comma (,) serves as decimal mark. Source: DIW Berlin

In addition to these various tax rates, a proposal of Schulmeister and Sokoll (2013) is factored. They suggest an alignment of the two tax rates to that of the derivatives so as to put the securities transactions—with their close connection to the real economy—in a relatively better position than envisioned in the EU Commission's proposal.

4.2 … uses publicly available data

To estimate the turnover proportion attributable to residence principle and issuance principle, we use data from 2012. To calculate the share turnover, we use data on market capitalization and turnover frequency from the World Bank and the European Central Bank. A correction factor is used to take the OTC share trading into account. Gomper and Pierron (2010) estimate OTC share trading at just under 40% of the total market.[14] We use this information to extrapolate the attributed shares revenue to 100 percent. For the bonds revenue, we draw upon data from the Federation of European Securities Exchanges (FESE) and the World Federation of Exchanges (WFE).[15] Following Copenhagen Economics (2014), it is assumed here that the observable trade accounts for 84 percent of total trade. The attributed turnover is corrected accordingly.

As the vast majority of the bond turnover is known to come from government bonds, they are included in the estimate to the extent permitted by the available data. This available data, however, is less than satisfactory because usually, selected financial institutions trade these types of bonds over-the-counter (OTC) (Bias und Green 2007). For example, according to the German Finance Agency,[16] turnover from German government bonds amounted to 5.501 billion EUR in 2012. In comparison, the FESE's data for 2012 accounts for just over 33 billion EUR in turnover of private domestic bonds, and in turnover of public bonds, even less, at only 18

[14] The exact value is 37.8% of the OTC share market in the overall market (Gomper and Pierron 2010, p. 15). In AFME (2011), the OTC share of the total market is estimated at only 12%. This would mean a lower correction and hence lower attributable revenues.

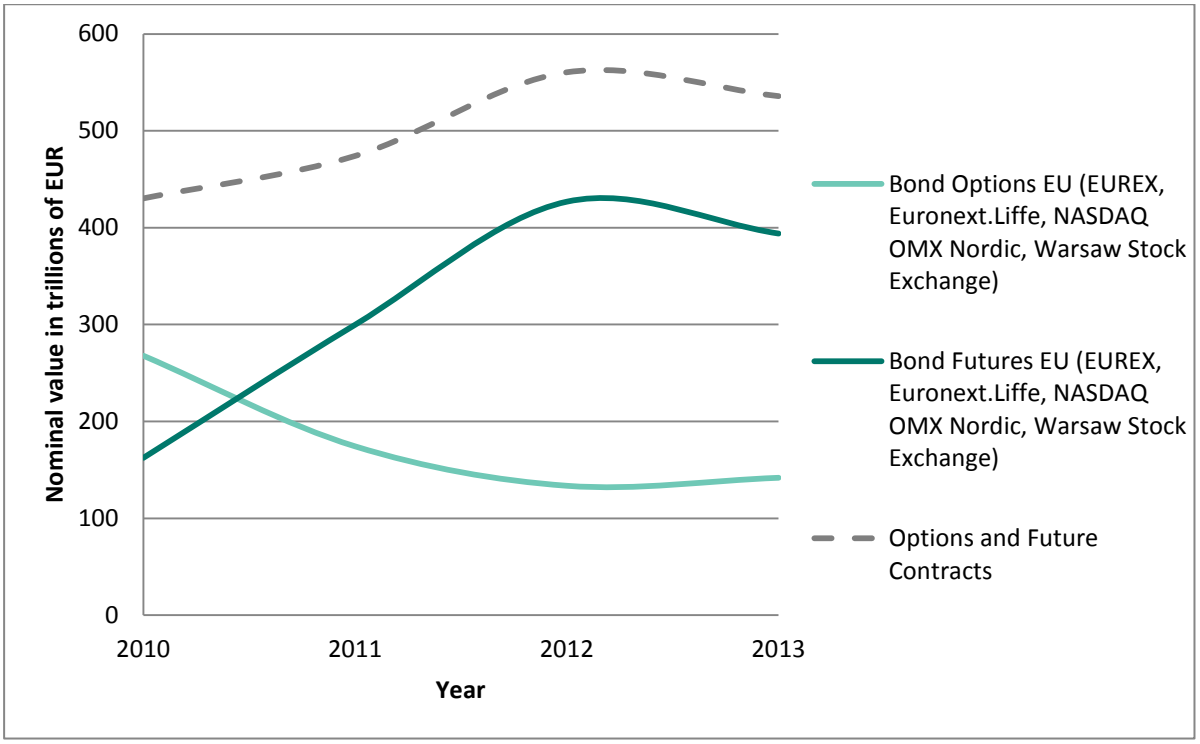
[15] The turnover of Euronext, the common exchange of Belgium, Portugal, France, and the Netherlands, is broken down by respective country by means of estimation.

[16] The Finance Agency GmbH of the Federal Republic of Germany makes this information available in the form of fact sheets,
http://www.deutschefinanzagentur.de/fileadmin/Material_Deutsche_Finanzagentur/PDF/Aktuelle_Informationen/bund_fact_sheet.pdf (accessed 10 December 2014).

billion EUR. It is therefore necessary to resort to the national financial agencies; however, these often only provide incomplete data for OTC sales of domestic government bonds.

The data on the transaction volume of listed derivatives also come from the statistics of the WFE and FESE. Data on the OTC transaction volumes of derivatives come from the Triennial Survey of the Bank for International Settlements (BIS). These surveys are conducted every three years, and account for country-specific OTC transaction volumes of derivatives. Here we draw on the 2013 Triennial Survey and calculate the corresponding values back to 2012. Data on sales of credit default swaps (CDS) are unavailable, but the CDS data from the Bank for International Settlements make it possible to determine the "market share" of CDS in the OTC interest rate derivatives based on outstanding nominal value. This share has been declining since 2010 and was at 5,12 percent at the end of 2012. Assuming that CDS are traded as often as other OTC interest rate derivatives, the share of turnover corresponds to the share of the outstanding nominal value. Accordingly, we calculate a taxable turnover from CDS transactions at 5,12 percent of the OTC interest rate derivatives sales.

Figure 4-1
Turnover of listed bond options and bond futures contracts at European derivatives stock markets, 2010-2013

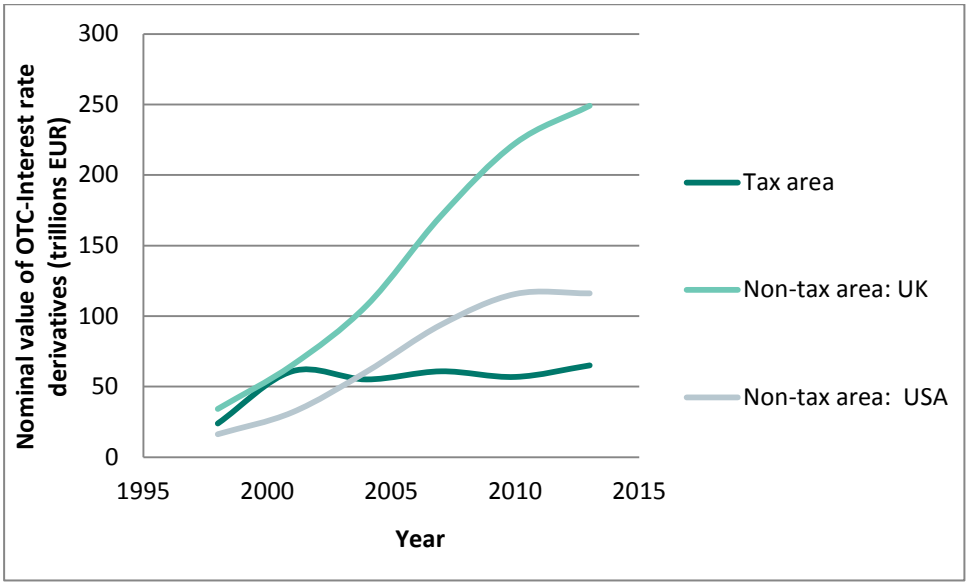


Source: DIW Berlin based on data from Federation of European Stock Exchanges (FESE), various years

Interest rate derivatives contribute significantly to the taxable turnover, and thus to tax revenues. In particular, the nominal values of exchange-traded future contracts on bonds grew strongly during the acute debt crisis in the euro area (Figure 4-1). The nominal value of transactions made with bond options, however, declined between 2010 and 2012. It was not until the end of 2013 that a slight increase reappeared. Overall, the transaction volume of exchange-traded interest rate derivatives increased by more than 24 percent between 2010 and 2013.

The growth of the nominal value of the transactions with OTC interest rate derivatives (excluding CDS) has taken place primarily outside the tax area. The growth was particularly high in the UK. Within the tax area, the volume of transactions with OTC derivatives has remained relatively stable (Figure 4-2).

Figure 4-2
Transaction volumes for OTC interest rate derivatives in the tax area, the United Kingdom, and the United States, 1995-2013



Source: DIW Berlin based on data from BIS (Triennial Survey 2013)

5 Substantial tax revenue requires a broad tax base

Table 5-1 shows the estimated revenues for Germany, France, Italy, and Austria, taking into account government bonds, for various financial instruments and scenarios. The tax rates are 0,1 percent per party for securities, and 0,01 percent per party for derivatives. The scenarios mentioned earlier are also taken into consideration: A 15 percent evasion in securities trading and a 75 percent evasion in derivatives trading (1); no evasion (2); and an evasion of 50 percent only in derivatives (3).

As could be expected, Germany and France generate the largest revenues by far. Given a comprehensive tax base, Germany's estimated revenue amounts to around 18 billion EUR under the maximum evasion scenario (15 percent evasion in stock and bond trading, as well as 75 percent evasion in the derivatives transactions) and just under 45 billion EUR if there is no evasion. France's tax revenue varies from about 14 billion EUR to just under 36 billion EUR, depending on the scenario. The estimated volume for Italy is between 3 billion EUR and 6 billion EUR. Austria could expect revenues between over 700 million EUR (maximum evasion scenario) and

about 1.5 billion EUR (no evasion). Even if government bonds are included, the majority of revenue in all countries will still come from derivatives, leading to correspondingly high tax revenues from derivatives if the scenarios with no or only moderate evasion are assumed. Only if we assume the maximum evasion scenario will the revenues from derivatives lag behind those from stock and bond trading.

Compared to the other OTC interest rate derivatives, the "market share" of the CDS is small; therefore, they also contribute very little to tax revenue. If the CDS were the only taxable instrument of the class of derivatives—as in the former French proposal—the tax revenue based on derivatives would still remain very low, even if the CDS market players did not switch over to other, non-taxable market segments. Assuming the moderate evasion scenario, the estimated income from CDS would fluctuate between approximately 340 million EUR (France) and 6 million EUR (Austria).

With a broad tax base, substantial revenues can also be generated at lower tax rates. Table 5-2 shows the estimates. However, if the rates were reduced to only 10% of the original proposal (bottom rows of Table 5-2), the revenue of Germany would still range from 2 billion EUR (maximum evasion) to 5 billion EUR (no evasion), and that of France from 1,5 billion EUR (maximum evasion) to 4,5 billion EUR—but Italy's revenue would probably remain under 1 billion EUR, and that of Austria would be in the low hundreds of millions.

Table 5-1

Tax revenue resulting from a broad base for Germany, France, Italy, and Austria

Broad base	Germany				France				Italy				Austria			
Instrument	Turnover billion EUR	Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives)	Turnover billion EUR	Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives	Turnover billion EUR	Revenue billion EUR (evasion: 15%,	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives	Turnover billion EUR	Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives
Securities	**9.637,1**	**10,44**	**12,29**	**12,29**	**6.977,1**	**7,56**	**8,90**	**8,90**	**2.340,7**	**2,54**	**2,98**	**2,98**	**456,2**	**0,49**	**0,58**	**0,58**
Equity shares	1.804,9	1,96	2,30	2,30	1.918,0	2,08	2,45	2,45	1.091,6	1,18	1,39	1,39	125,6	0,14	0,16	0,16
Bonds	7.832,2	8,49	9,99	9,99	5.059,1	5,48	6,45	6,45	1.249,1	1,35	1,59	1,59	330,6	0,36	0,42	0,42
Exchange traded derivatives	**173.970,5**	**6,71**	**26,85**	**13,42**	**116.384,7**	**4,49**	**17,96**	**8,98**	**8.745,4**	**0,34**	**1,35**	**0,67**	**3.648,2**	**0,14**	**0,56**	**0,28**
Equity options	5.433,2	0,21	0,84	0,42	1.446,8	0,06	0,22	0,11	226,3	0,01	0,03	0,02	89,8	0,00	0,01	0,01
Equity futures	4.226,4	0,16	0,65	0,33	1.732,9	0,07	0,27	0,13	227,3	0,01	0,04	0,02	186,8	0,01	0,03	0,01
Securitized derivatives	44,3	0,00	0,01	0,00	7,1	0,00	0,00	0,00	1,0	0,00	0,00	0,00	0,5	0,00	0,00	0,00
Interest rate derivatives-options	27.087,8	1,05	4,18	2,09	31.034,0	1,20	4,79	2,39	1.890,6	0,07	0,29	0,15	703,1	0,03	0,11	0,05
Interest rate derivatives-futures	135.998,8	5,25	20,99	10,49	80.936,9	3,12	12,49	6,24	6.033,3	0,23	0,93	0,47	2.556,8	0,10	0,39	0,20
Commodity options	47,3	0,00	0,01	0,00	46,3	0,00	0,01	0,00	15,9	0,00	0,00	0,00	5,2	0,00	0,00	0,00
Commodity futures	1.125,3	0,04	0,17	0,09	1.173,3	0,05	0,18	0,09	348,6	0,01	0,05	0,03	105,2	0,00	0,02	0,01
Currency options	5,1	0,00	0,00	0,00	5,2	0,00	0,00	0,00	1,7	0,00	0,00	0,00	0,7	0,00	0,00	0,00
Currency futures	2,3	0,00	0,00	0,00	2,2	0,00	0,00	0,00	0,7	0,00	0,00	0,00	0,2	0,00	0,00	0,00
Derivatives OTC	**54.582,4**	**1,45**	**5,80**	**2,90**	**77.491,0**	**2,22**	**8,89**	**4,44**	**15.006,2**	**0,42**	**1,68**	**0,84**	**4.460,1**	**0,10**	**0,40**	**0,20**
Interest rate derivatives (IR-D)	25.196,7	1,03	4,11	2,05	41.132,9	1,68	6,70	3,35	7.644,0	0,31	1,25	0,62	1.414,3	0,06	0,23	0,12
*Forward																
*Swaps																
*Options and other IR-D																
FX-derivatives	29.385,7				36.358,1				7.362,2				3.045,8			
*Forward	3.656,5	0,05	0,18	0,09	4.112,8	0,05	0,21	0,10	992,9	0,01	0,05	0,03	630,2	0,01	0,03	0,02
*Currency swaps	429,8	0,01	0,02	0,01	784,2	0,01	0,04	0,02	93,1	0,00	0,00	0,00	50,4	0,00	0,00	0,00
*Foreign exchange swaps	23.428,4	0,30	1,18	0,59	29.322,9	0,37	1,48	0,74	5.763,6	0,07	0,29	0,15	2.204,6	0,03	0,11	0,06
*Options	1.871,1	0,02	0,09	0,05	2.138,1	0,03	0,11	0,05	512,6	0,01	0,03	0,01	160,5	0,00	0,01	0,00
CDS (5,12 % of the OTC IR-D)	**1.290,1**	**0,05**	**0,21**	**0,11**	**2.106,0**	**0,09**	**0,34**	**0,17**	**391,4**	**0,02**	**0,06**	**0,03**	**72,4**	**0,00**	**0,01**	**0,01**
Derivatives in total	**229.843,0**	**8,16**	**32,65**	**16,32**	**195.981,7**	**6,71**	**26,85**	**13,42**	**24.142,9**	**0,76**	**3,03**	**1,52**	**8.180,8**	**0,24**	**0,96**	**0,48**
All instruments	**239.480,1**	**18,61**	**44,94**	**28,61**	**202.958,9**	**14,27**	**35,74**	**22,32**	**26.483,6**	**3,29**	**6,02**	**4,50**	**8.637,0**	**0,73**	**1,54**	**1,06**

A period (.) is used within a number to separate 000, while a comma (,) serves as the decimal mark. Tax rates and scenarios as defined in Table 4-4. Source: DIW Berlin own calculations based on data from FESE, WFE, BIS 2013 Triennial Report and statistical releases, ECB, World Bank, IMF CPIS statistics, Euronext, Eurex, LSE, national financial agencies, and SIFMA. Tax revenue is expressed in billion EUR up to 2 decimal places. Therefore, amounts below 5 million EUR are rounded down and appear as 0,00 billion EUR. Due to Excel's rounding function, the amounts that appear here are not necessarily factored into the corresponding totals. Source: Own calculation of DIW Berlin

Table 5-2
Tax revenue resulting from a broad tax base with varying tax rates

Broad base	Germany				France				Italy				Austria			
Variation of tax rates		Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives)		Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives)		Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives)		Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives)
Revenue with tax rates of the EU Commission's proposal	**Tax rate**	**18,61**	**44,94**	**28,61**	**Tax rate**	**14,27**	**35,74**	**22,32**	**Tax rate**	**3,29**	**6,02**	**4,50**	**Tax rate**	**0,73**	**1,54**	**1,06**
Revenue from equity and bonds	0,1%	10,44	12,29	12,29	0,1%	7,56	8,90	8,90	0,1%	2,54	2,98	2,98	0,1%	0,49	0,58	0,58
Revenue from derivatives	0,01%	8,16	32,65	16,32	0,01%	6,71	26,85	13,42	0,01%	0,76	3,03	1,52	0,01%	0,24	0,96	0,48
Revenue with half of the tax rates of the EU Commission's proposal	**Tax rate**	**10,35**	**24,55**	**15,78**	**Tax rate**	**7,96**	**19,64**	**12,36**	**Tax rate**	**1,87**	**3,39**	**2,55**	**Tax rate**	**0,42**	**0,88**	**0,61**
Revenue from equity and bonds	0,05%	5,97	7,02	7,02	0,05%	4,32	5,08	5,08	0,05%	1,45	1,71	1,71	0,05%	0,28	0,33	0,33
Revenue from derivatives	0,005%	4,38	17,53	8,76	0,005%	3,64	14,56	7,28	0,005%	0,42	1,69	0,84	0,005%	0,14	0,55	0,27
Revenue with half of the tax rate of the EU Commission's proposal for securities, and 1/10 of the rate for derivatives	**Tax rate**	**6,92**	**10,82**	**8,92**	**Tax rate**	**5,13**	**8,30**	**6,69**	**Tax rate**	**1,55**	**2,10**	**1,90**	**Tax rate**	**0,32**	**0,46**	**0,40**
Revenue from equity and bonds	0,05%	5,97	7,02	7,02	0,05%	4,32	5,08	5,08	0,05%	1,45	1,71	1,71	0,05%	0,28	0,33	0,33
Revenue from derivatives	0,001%	0,95	3,80	1,90	0,001%	0,80	3,22	1,61	0,001%	0,10	0,39	0,19	0,001%	0,03	0,13	0,07
Revenue with 1/10 of the tax rates of the EU Commission's proposal	**Tax rate**	**2,30**	**5,39**	**3,49**	**Tax rate**	**1,78**	**4,37**	**2,76**	**Tax rate**	**0,42**	**0,77**	**0,58**	**Tax rate**	**0,10**	**0,21**	**0,14**
Revenue from equity and bonds	0,01%	1,35	1,59	1,59	0,01%	0,98	1,15	1,15	0,01%	0,33	0,39	0,39	0,01%	0,06	0,08	0,08
Revenue from derivatives	0,001%	0,95	3,80	1,90	0,001%	0,80	3,22	1,61	0,001%	0,10	0,39	0,19	0,001%	0,03	0,13	0,07

A period (.) is used within a number to separate 000, while a comma (,) serves as the decimal mark. Source: DIW Berlin own calculations

Table 5-3 shows tax revenue resulting from a uniform tax rate of 0,01% for derivatives and securities. In this case, securities trading would bear a comparatively low tax burden. In all countries under observation, the revenues would come primarily from derivatives trading. For example, Germany would earn only 1 billion EUR to 1,5 billion EUR from securities trading, whereas it could expect between 8 billion EUR and just under 33 billion EUR from derivatives trading.

Table 5-3
Broad tax base—uniform tax rate 0,01%

Instrument	Tax rate	Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives)	Tax rate	Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives)
	Germany				France			
Revenue		**9,51**	**34,23**	**17,91**		**7,69**	**27,99**	**14,57**
Revenue from equity and bonds	0,01%	1,35	1,59	1,59	0,01%	0,98	1,15	1,15
Revenue from derivatives	0,01%	8,16	32,65	16,32	0,01%	6,71	26,85	13,42
	Italy				Austria			
Revenue		**1,09**	**3,42**	**1,90**		**0,30**	**1,03**	**0,55**
Revenue from equity and bonds	0,01%	0,33	0,39	0,39	0,01%	0,06	0,08	0,08
Revenue from derivatives	0,01%	0,76	3,03	1,52	0,01%	0,24	0,96	0,48

A period (.) is used within a number to separate 000, while a comma (,) serves as the decimal mark.

Source: DIW Berlin own calculations

5.1 Substantial losses due to government bonds exception

If the secondary market for government bonds is not taxed, the tax base in securities trading declines dramatically (Table 5-4).[17] In this case, Germany would only earn about 3 billion EUR from securities trading. Germany's total revenue without government bond sales would range from just under 11 billion EUR (maximum evasion) to nearly 36 billion EUR (no evasion).

If the tax rates were reduced by 50% (90%), the corresponding revenue would range from just 6 billion EUR (about 1 billion) to about 19 billion EUR (about 4 billion) (Table 5-5). With the EU Commission's approach to tax rates, France can expect a total revenue ranging from just

[17] This assumes that the interest rate derivatives are fully taxable, even if the underlying security is a government bond.

under 10 billion EUR to 30 billion EUR. With reduced tax rates, revenues would range from 5 billion EUR to 16 billion EUR (50% reduction of tax rates), or from 1 billion EUR to about 3,5 billion EUR (90% reduction of tax rates). Italy's revenues range from about 2 billion EUR to just under 5 billion EUR, and Austria can expect a revenue ranging from half a billion to 1,2 billion EUR. With a 90% reduction in tax rates, Italy still can expect revenue in the mid three-digit million range, while Austria's revenue, however, would only land in the lower three-digit million range—even assuming that no evasion takes place.

The derivatives make a larger contribution to the total revenue if government bond trading in secondary markets is not taxed. Using the tax rates from the Commission's proposal, at least 70 percent of the revenue in Germany and France can be attributed to derivatives (in the moderate scenario, it is more than 80% each). In the other two countries, derivatives are less important. In the moderate evasion scenario, Italy obtains about half of its revenue through derivatives, and Austria obtains about two-thirds through derivatives.

Table 5-4
Tax revenue without government bonds for Germany, France, Italy, and Austria

Without govenment bonds	Germany				France				Italy				Austria			
Instrument	Turnover billion EUR	Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives)	Turnover billion EUR	Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives)	Turnover billion EUR	Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives)	Turnover billion EUR	Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives)
Securities	**2.487,2**	**2,70**	**3,17**	**3,17**	**2.549,6**	**2,76**	**3,25**	**3,25**	**1.286,6**	**1,39**	**1,64**	**1,64**	**197,5**	**0,21**	**0,25**	**0,25**
Equity shares	1.804,9	1,96	2,30	2,30	1.918,0	2,08	2,45	2,45	1.091,6	1,18	1,39	1,39	125,6	0,14	0,16	0,16
Bonds	682,3	0,74	0,87	0,87	631,6	0,68	0,81	0,81	195,0	0,21	0,25	0,25	71,9	0,08	0,09	0,09
Exchange traded derivatives	**173.970,5**	**6,71**	**26,85**	**13,42**	**116.384,7**	**4,49**	**17,96**	**8,98**	**8.745,4**	**0,34**	**1,35**	**0,67**	**3.648,2**	**0,14**	**0,56**	**0,28**
Equity options	5.433,2	0,21	0,84	0,42	1.446,8	0,06	0,22	0,11	226,3	0,01	0,03	0,02	89,8	0,00	0,01	0,01
Equity futures	4.226,4	0,16	0,65	0,33	1.732,9	0,07	0,27	0,13	227,3	0,01	0,04	0,02	186,8	0,01	0,03	0,01
Securitized derivatives	44,3	0,00	0,01	0,00	7,1	0,00	0,00	0,00	1,0	0,00	0,00	0,00	0,5	0,00	0,00	0,00
Interest rate derivatives-options	27.087,8	1,05	4,18	2,09	31.034,0	1,20	4,79	2,39	1.890,6	0,07	0,29	0,15	703,1	0,03	0,11	0,05
Interest rate derivatives-futures	135.998,8	5,25	20,99	10,49	80.936,9	3,12	12,49	6,24	6.033,3	0,23	0,93	0,47	2.556,8	0,10	0,39	0,20
Commodity options	47,3	0,00	0,01	0,00	46,3	0,00	0,01	0,00	15,9	0,00	0,00	0,00	5,2	0,00	0,00	0,00
Commodity futures	1.125,3	0,04	0,17	0,09	1.173,3	0,05	0,18	0,09	348,6	0,01	0,05	0,03	105,2	0,00	0,02	0,01
Currency options	5,1	0,00	0,00	0,00	5,2	0,00	0,00	0,00	1,7	0,00	0,00	0,00	0,7	0,00	0,00	0,00
Currency futures	2,3	0,00	0,00	0,00	2,2	0,00	0,00	0,00	0,7	0,00	0,00	0,00	0,2	0,00	0,00	0,00
Derivatives OTC	**54.582,4**	**1,45**	**5,80**	**2,90**	**77.491,0**	**2,22**	**8,89**	**4,44**	**15.006,2**	**0,42**	**1,68**	**0,84**	**4.460,1**	**0,10**	**0,40**	**0,20**
Interest rate derivatives (IR-D)	25.196,7	1,03	4,11	2,05	41.132,9	1,68	6,70	3,35	7.644,0	0,31	1,25	0,62	1.414,3	0,06	0,23	0,12
*Forward																
*Swaps																
*Options and other IR-D																
FX-derivatives																
*Forward	3.656,5	0,05	0,18	0,09	4.112,8	0,05	0,21	0,10	992,9	0,01	0,05	0,03	630,2	0,01	0,03	0,02
*Currency swaps	429,8	0,01	0,02	0,01	784,2	0,01	0,04	0,02	93,1	0,00	0,00	0,00	50,4	0,00	0,00	0,00
*Foreign exchange swaps	23.428,4	0,30	1,18	0,59	29.322,9	0,37	1,48	0,74	5.763,6	0,07	0,29	0,15	2.204,6	0,03	0,11	0,06
*Options	1.871,1	0,02	0,09	0,05	2.138,1	0,03	0,11	0,05	512,6	0,01	0,03	0,01	160,5	0,00	0,01	0,00
CDS (5,12 % of the OTC IR-D)	**1.290,1**	**0,05**	**0,21**	**0,11**	**2.106,0**	**0,09**	**0,34**	**0,17**	**391,4**	**0,02**	**0,06**	**0,03**	**72,4**	**0,00**	**0,01**	**0,01**
Derivatives in total	**229.843,0**	**8,16**	**32,65**	**16,32**	**195.981,7**	**6,71**	**26,85**	**13,42**	**24.142,9**	**0,76**	**3,03**	**1,52**	**8.180,8**	**0,24**	**0,96**	**0,48**
All instruments	**232.330,2**	**10,86**	**35,82**	**19,50**	**198.531,4**	**9,47**	**30,10**	**16,67**	**25.429,6**	**2,15**	**4,67**	**3,16**	**8.378,3**	**0,45**	**1,21**	**0,73**

A period (.) is used within a number to separate 000, while a comma (,) serves as the decimal mark. Tax rates and scenarios as defined in Table 4-4. Source: DIW Berlin own calculations based on data from FESE, WFE, BIS 2013 Triennial Report and statistical releases, ECB, World Bank, IMF CPIS statistics, Euronext, Eurex, LSE, national financial agencies, and SIFMA. Tax revenue is expressed in billion EUR up to 2 decimal places. Therefore, amounts below 5 million EUR are rounded down and appear as 0,00 billion EUR. Due to Excel's rounding function, the amounts that appear here are not necessarily factored into the corresponding totals. Source: Own calculation of DIW Berlin

Table 5-5

Tax revenue resulting from a broad tax base at varying tax rates—without government bonds

Without government bonds	Germany				France				Italy				Austria			
Variation of tax rates		Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives		Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives)		Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives)		Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives)
Revenue with tax rate of the EU Commission's proposal	**Tax rate**	**10,86**	**35,82**	**19,50**	**Tax rate**	**9,47**	**30,10**	**16,67**	**Tax rate**	**2,15**	**4,67**	**3,16**	**Tax rate**	**0,45**	**1,21**	**0,73**
Revenue from equity and bonds	0,1%	2,70	3,17	3,17	0,1%	2,76	3,25	3,25	0,1%	1,39	1,64	1,64	0,1%	0,21	0,25	0,25
Revenue from derivatives	0,01%	8,16	32,65	16,32	0,01%	6,71	26,85	13,42	0,01%	0,76	3,03	1,52	0,01%	0,24	0,96	0,48
Revenue with half of the tax rates of the EU Commission's proposal	**Tax rate**	**5,92**	**19,34**	**10,58**	**Tax rate**	**5,22**	**16,41**	**9,14**	**Tax rate**	**1,22**	**2,63**	**1,78**	**Tax rate**	**0,26**	**0,69**	**0,42**
Revenue from equity and bonds	0,05%	1,54	1,81	1,81	0,05%	1,58	1,86	1,86	0,05%	0,80	0,94	0,94	0,05%	0,12	0,14	0,14
Revenue from derivatives	0,005%	4,38	17,53	8,76	0,005%	3,64	14,56	7,28	0,005%	0,42	1,69	0,84	0,005%	0,14	0,55	0,27
Revenue with half of the tax rate of the EU Commission's proposal for securities, and 1/10 of the rate for derivatives	**Tax rate**	**2,49**	**5,61**	**3,71**	**Tax rate**	**2,38**	**5,08**	**3,47**	**Tax rate**	**0,89**	**1,33**	**1,13**	**Tax rate**	**0,15**	**0,27**	**0,21**
Revenue from equity and bonds	0,05%	1,54	1,81	1,81	0,05%	1,58	1,86	1,86	0,05%	0,80	0,94	0,94	0,05%	0,12	0,14	0,14
Revenue from derivatives	0,001%	0,95	3,80	1,90	0,001%	0,80	3,22	1,61	0,001%	0,10	0,39	0,19	0,001%	0,03	0,13	0,07
Revenue with 1/10 of the tax rates of the EU Commission's proposal	**Tax rate**	**1,30**	**4,21**	**2,31**	**Tax rate**	**1,16**	**3,64**	**2,03**	**Tax rate**	**0,28**	**0,60**	**0,41**	**Tax rate**	**0,06**	**0,16**	**0,10**
Revenue from equity and bonds	0,01%	0,35	0,41	0,41	0,01%	0,36	0,42	0,42	0,01%	0,18	0,21	0,21	0,01%	0,028	0,032	0,032
Revenue from derivatives	0,001%	0,95	3,80	1,90	0,001%	0,80	3,22	1,61	0,001%	0,10	0,39	0,19	0,001%	0,033	0,131	0,065

A period (.) is used within a number to separate 000, while a comma (,) serves as the decimal mark. Source: DIW Berlin own calculations

5.2 Substantial losses through the waiver of the residence principle

In this section, we examine how the waiver of the residence principle would impact the tax revenues for the four countries. All other modalities of revenue allocation remain unchanged.[18] Table 5-7 shows the revenue under the assumption that the tax rates follow the Commission's proposal and only the issuance principle is in effect. Table 5-8 considers various tax rates if the residence principle were waived; the sums are noticeably smaller in these circumstances.

Italy and Austria would be particularly affected. While France and Germany would only have to worry about a maximum loss of thirty percent of the estimated income—in comparison to the income without concurrent taxation of government bonds—the decline for Italy amounts to more than 40% (Table 5-6). And Austria would lose more than three-quarters of its forecasted revenue. Therefore, smaller countries may be disproportionately affected if the residence principle were dropped.

Table 5-6
Percentage decline in tax revenue if the residence principle is waived (without government bonds)

	Germany			France			Italy			Austria		
	S 1	S 2	S 3	S 1	S 2	S 3	S 1	S 2	S 3	S 1	S 2	S 3
Revenue (billion EUR)	**10,86**	**35,82**	**19,50**	**9,47**	**30,10**	**16,67**	**2,15**	**4,67**	**3,16**	**0,45**	**1,21**	**0,73**
Revenue if residence principle is waived (billion EUR)	**8,20**	**28,18**	**15,06**	**6,41**	**22,03**	**11,76**	**1,22**	**2,04**	**1,61**	**0,09**	**0,19**	**0,13**
Loss in revenue (%)	24	21	23	32	27	29	43	56	49	80	84	82

A period (.) is used within a number to separate 000, while a comma (,) serves as the decimal mark. Tax rates: 0,1 percent per party for securities, 0,01 percent per party for derivatives,

Scenarios: 15 percent withdrawal in securities trading and a 75 percent withdrawal in derivatives trading (S1); no withdrawal (S2); and an evasion of 50 percent only in derivatives (S3)

Source: Calculations of DIW Berlin

[18] If a party residing in the country under observation trades the domestic financial instrument with a counterparty from another country in the tax area, the revenue is split between both countries. If the transaction with a domestic financial instrument takes place between a party from another country in the tax area and a counterparty from the non-tax area, the income is given to the country in the tax area, and the issuing country comes out empty-handed. The issuing country is owed the entire revenue if both trading parties are based in the non-tax area.

Table 5-7

Tax revenue if the residence principle is waived (without government bonds) for Germany, France, Italy, and Austria

Residence principle waived	Germany				France				Italy				Austria			
Instrument	Turnover billion EUR	Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives)	Turnover billion EUR	Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives)	Turnover billion EUR	Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives)	Turnover billion EUR	Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives)
Securities	**1.513,9**	**1,64**	**1,93**	**1,93**	**1.175,3**	**1,27**	**1,50**	**1,50**	**930,2**	**1,01**	**1,19**	**1,19**	**56,0**	**0,06**	**0,07**	**0,07**
Equity shares	1.479,8	1,60	1,89	1,89	1.171,9	1,27	1,49	1,49	915,1	0,99	1,17	1,17	56,0	0,06	0,07	0,07
Bonds	34,076	0,037	0,043	0,043	3,420	0,004	0,004	0,004	15,093	0,016	0,019	0,019	0,059	0,000	0,000	0,000
Exchange traded derivatives	**151.114,8**	**5,83**	**23,32**	**11,66**	**91.532,3**	**3,53**	**14,12**	**7,06**	**202,4**	**0,01**	**0,03**	**0,02**	**125,8**	**0,00**	**0,02**	**0,01**
Equity options	5.163,3	0,20	0,80	0,40	829,5	0,03	0,13	0,06	109,5	0,00	0,02	0,01	5,7	0,00	0,00	0,00
Equity futures	3.941,7	0,15	0,61	0,30	1.126,2	0,04	0,17	0,09	92,9	0,00	0,01	0,01	120,1	0,00	0,02	0,01
Securitized derivatives	43,1	0,00	0,01	0,00	4,6	0,00	0,00	0,00	0,0	0,00	0,00	0,00	0,0	0,00	0,00	0,00
Interest rate derivatives-options	21.411,7	0,83	3,30	1,65	25.609,3	0,99	3,95	1,98	0,0	0,00	0,00	0,00	0,0	0,00	0,00	0,00
Interest rate derivatives-futures	120.555,1	4,65	18,60	9,30	63.884,7	2,46	9,86	4,93	0,0	0,00	0,00	0,00	0,0	0,00	0,00	0,00
Commodity options	0,0	0,00	0,00	0,00	0,0	0,00	0,00	0,00	0,0	0,00	0,00	0,00	0,0	0,00	0,00	0,00
Commodity futures	0,0	0,00	0,00	0,00	77,5	0,00	0,01	0,01	0,0	0,00	0,00	0,00	0,0	0,00	0,00	0,00
Currency options	0,0	0,00	0,00	0,00	0,4	0,00	0,00	0,00	0,0	0,00	0,00	0,00	0,0	0,00	0,00	0,00
Currency futures	0,0	0,00	0,00	0,00	0,0	0,00	0,00	0,00	0,0	0,00	0,00	0,00	0,0	0,00	0,00	0,00
Derivatives OTC	**26.764,7**	**0,73**	**2,93**	**1,47**	**52.926,4**	**1,60**	**6,40**	**3,20**	**6.805,4**	**0,21**	**0,83**	**0,41**	**1.582,8**	**0,03**	**0,10**	**0,05**
Interest rate derivatives (IR-D)	13.064,0	0,53	2,13	1,06	30.869,5	1,26	5,03	2,52	3.983,7	0,16	0,65	0,32	190,2	0,01	0,03	0,02
*Forward																
*Swaps																
*Options and other IR-D																
FX-derivatives	**13.700,7**				**22.056,9**				**2.821,7**				**1.392,6**			
*Forward	839,8	0,01	0,04	0,02	1.440,4	0,02	0,07	0,04	147,6	0,00	0,01	0,00	365,8	0,00	0,02	0,01
*Currency swaps	167,5	0,00	0,01	0,00	552,7	0,01	0,03	0,01	16,3	0,00	0,00	0,00	25,4	0,00	0,00	0,00
*Foreign exchange swaps	12.144,4	0,15	0,61	0,31	19.186,5	0,24	0,97	0,49	2.545,7	0,03	0,13	0,06	968,1	0,01	0,05	0,02
*Options	549,0	0,01	0,03	0,01	877,3	0,01	0,04	0,02	112,1	0,00	0,01	0,00	33,3	0,00	0,00	0,00
CDS (5,12 % of the OTC IR-D)	**668,9**	**0,03**	**0,11**	**0,05**	**1.580,5**	**0,06**	**0,26**	**0,13**	**204,0**	**0,01**	**0,03**	**0,02**	**9,7**	**0,00**	**0,00**	**0,00**
Derivatives in total	**178.548,4**	**6,56**	**26,25**	**13,13**	**146.039,1**	**5,13**	**20,53**	**10,26**	**7.211,7**	**0,21**	**0,86**	**0,43**	**1.718,4**	**0,03**	**0,12**	**0,06**
All instruments	**180.062,3**	**8,20**	**28,18**	**15,06**	**147.214,4**	**6,41**	**22,03**	**11,76**	**8.141,9**	**1,22**	**2,04**	**1,61**	**1.774,4**	**0,09**	**0,19**	**0,13**

A period (.) is used within a number to separate 000, while a comma (,) serves as the decimal mark. Tax rates and scenarios as defined in Table 4-4. Source: DIW Berlin own calculations based on data from FESE, WFE, BIS 2013 Triennial Report and statistical releases, ECB, World Bank, IMF CPIS statistics, Euronext, Eurex, LSE, national financial agencies, and SIFMA. Tax revenue is expressed in billion EUR up to 2 decimal places. Therefore, amounts below 5 million EUR are rounded down and appear as 0,00 billion EUR. Due to Excel's rounding function, the amounts that appear here are not necessarily factored into the corresponding totals. Source: Own calculation of DIW Berlin

Table 5-8

Tax revenue at varying tax rates if the residence principle is waived (without government bonds)

Residence principle waived	Germany				France				Italy				Austria			
Instrument		Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives)		Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives)		Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives)		Revenue billion EUR (evasion: 15%, 75%)	Revenue billion EUR (no tax evasion)	Revenue billion EUR (evasion: 50% with derivatives)
Revenue with tax rate of the EU Commission's proposal	**Tax rate**	**8,20**	**28,18**	**15,06**	**Tax rate**	**6,41**	**22,03**	**11,76**	**Tax rate**	**1,22**	**2,04**	**1,61**	**Tax rate**	**0,09**	**0,19**	**0,13**
Revenue from equity and bonds	0,1%	1,64	1,93	1,93	0,1%	1,27	1,50	1,50	0,1%	1,01	1,19	1,19	0,1%	0,06	0,07	0,07
Revenue from derivatives	0,01%	6,56	26,25	13,13	0,01%	5,13	20,53	10,26	0,01%	0,21	0,86	0,43	0,01%	0,03	0,12	0,06
Revenue with half of the tax rates of the EU Commission's proposal	**Tax rate**	**4,43**	**15,05**	**8,08**	**Tax rate**	**3,49**	**11,90**	**6,38**	**Tax rate**	**0,70**	**1,16**	**0,92**	**Tax rate**	**0,06**	**0,13**	**0,08**
Revenue from equity and bonds	0,05%	0,94	1,10	1,10	0,05%	0,73	0,86	0,86	0,05%	0,58	0,68	0,68	0,05%	0,03	0,04	0,04
Revenue from derivatives	0,005%	3,49	13,95	6,98	0,005%	2,76	11,04	5,52	0,005%	0,12	0,48	0,24	0,005%	0,02	0,09	0,04
Revenue with half of the tax rate of the EU Commission's proposal for securities, and 1/10 of the rate for derivatives	**Tax rate**	**1,68**	**4,08**	**2,59**	**Tax rate**	**1,33**	**3,27**	**2,06**	**Tax rate**	**0,60**	**0,79**	**0,74**	**Tax rate**	**0,04**	**0,07**	**0,05**
Revenue from equity and bonds	0,05%	0,94	1,10	1,10	0,05%	0,73	0,86	0,86	0,05%	0,58	0,68	0,68	0,05%	0,03	0,04	0,04
Revenue from derivatives	0,001%	0,74	2,97	1,49	0,001%	0,60	2,41	1,20	0,001%	0,03	0,12	0,06	0,001%	0,01	0,03	0,01
Revenue with 1/10 of the tax rates of the EU Commission's proposal	**Tax rate**	**0,96**	**3,22**	**1,74**	**Tax rate**	**0,77**	**2,60**	**1,40**	**Tax rate**	**0,16**	**0,27**	**0,21**	**Tax rate**	**0,01**	**0,03**	**0,02**
Revenue from equity and bonds	0,01%	0,21	0,25	0,25	0,01%	0,16	0,19	0,19	0,01%	0,13	0,15	0,15	0,01%	0,008	0,009	0,009
Revenue from derivatives	0,001%	0,74	2,97	1,49	0,001%	0,60	2,41	1,20	0,001%	0,03	0,12	0,06	0,001%	0,006	0,026	0,013

A period (.) is used within a number to separate 000, while a comma (,) serves as the decimal mark. Source: DIW Berlin own calculations

6 Derivatives taxation: The whole is more than the sum of its parts

A transaction tax that is as comprehensive as possible is more than the sum of the tax bases of the individual financial instruments. The reason for this lies in the external effects caused by the removal of financial instruments from the tax base. In this context, derivatives are of particular importance. Firstly, the vast majority of the tax base falls away if derivatives are exempted from taxation, and secondly, strong avoidance responses, and thus high external effects for the taxable securities, have to be taken into account. Financial innovations that mimic movements of the taxable securities and / or simply the trading with non-taxable derivatives instead of the security itself give reason to expect a reduction in revenue that goes far beyond the direct effect of the exclusion of this particular tax base.

The loss of income caused by the exemption of derivatives is significant (Table 6-1). If the secondary markets for government bonds is taxed, Germany will lose up to 73 percent of the revenue through the exemption of the derivatives. In the other two configurations being assessed, the revenue loss is up to more than 90%.[19] France's percentage losses due solely to the exclusion of this tax base are similarly high. In the no evasion scenario with taxed government bonds, Austria loses over 60 percent of the revenue and Italy loses 50 percent if derivatives are exempt.

The various bypass strategies—in the event that derivatives are exempted—have in common that they will likely be used, in particular, by market participants for whom the actual trading instrument is secondary. This is above all given if the trading is conducted primarily from the speculative motive and / or the arbitrage motive. For example, high-frequency trading tries to capitalize on, among other things, minimum price differentials between various markets. Such price differences are often perceptible only in the nanosecond range, but can still be exploited by high-frequency traders. In such cases, the trading instrument is secondary. Therefore, the costs of switching from securities to the derivatives segment will probably drop to zero.

[19] These maximum revenue losses belong to the scenario with no tax evasion (S2).

Table 6-1

Loss of tax revenue if the taxation of derivatives is waived—without avoidance responses

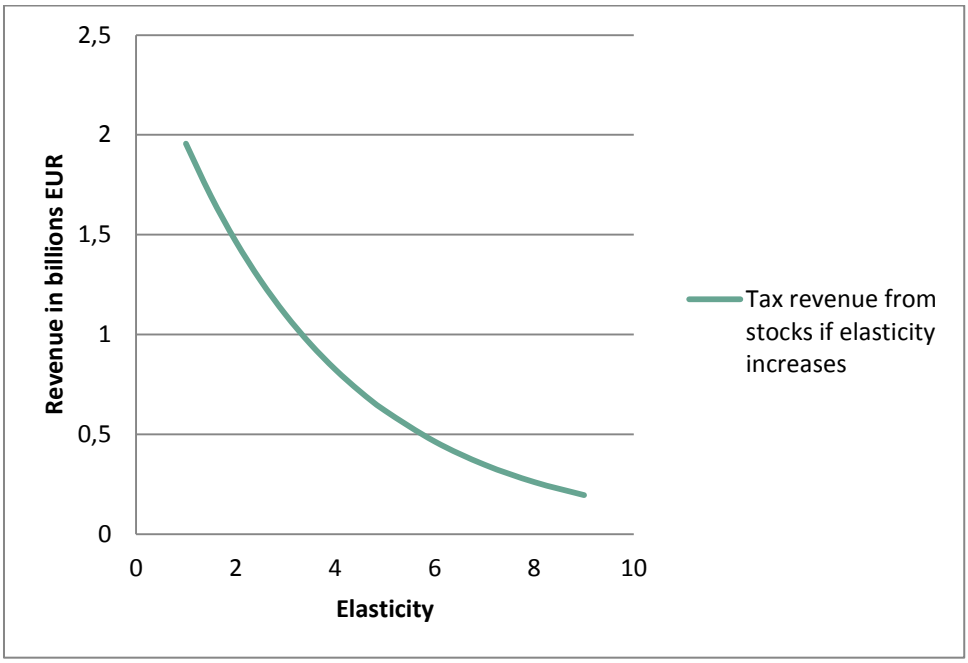
	Germany				France				Italy				Austria			
	Turnover (billion EUR)	Tax revenue (billion EUR)			Turnover (billion EUR)	Tax revenue (billion EUR)			Turnover (billion EUR)	Tax revenue (billion EUR)			Turnover (billion EUR)	Tax revenue (billion EUR)		
		S1	S2	S3		S1	S2	S3		S1	S2	S3		S1	S2	S3
With government bonds																
All derivatives	229843,0	8,2	32,6	16,3	195981,7	6,7	26,8	13,4	24142,9	0,8	3,0	1,5	8180,8	0,2	1,0	0,5
All financial instruments	239480,1	18,6	44,9	28,6	202958,9	14,3	35,7	22,3	26483,6	3,3	6,0	4,5	8637,0	0,7	1,5	1,1
Loss in revenue if derivatives are exempt (%)		**44%**	**73%**	**57%**		**47%**	**75%**	**60%**		**23%**	**50%**	**34%**		**33%**	**62%**	**45%**
Without government bonds																
All derivatives	229843,0	8,2	32,6	16,3	195981,7	6,7	26,8	13,4	24142,9	0,8	3,0	1,5	8180,8	0,2	1,0	0,5
All financial instruments	232330,2	10,9	35,8	19,5	198531,4	9,5	30,1	16,7	25429,6	2,2	4,7	3,2	8378,3	0,5	1,2	0,7
Loss in revenue if derivatives are exempt (%)		**75%**	**91%**	**84%**		**71%**	**89%**	**81%**		**35%**	**65%**	**48%**		**53%**	**79%**	**66%**
Issuance principle only																
All derivatives	178548,4	6,6	26,3	13,1	146039,1	5,1	20,5	10,3	7211,7	0,2	0,9	0,4	1718,4	0,0	0,1	0,1
All financial instruments	180062,3	8,2	28,2	15,1	147214,4	6,4	22,0	11,8	8141,9	1,2	2,0	1,6	1774,4	0,1	0,2	0,1
Loss in revenue if derivatives are exempt (%)		**80%**	**93%**	**87%**		**80%**	**93%**	**87%**		**18%**	**42%**	**27%**		**34%**	**63%**	**46%**

A period (.) is used within a number to separate 000, while a comma (,) serves as the decimal mark. Tax rates: 0,1 percent per party for securities, 0,01 percent per party for derivatives, scenarios: 15 percent evasion in securities trading, 75 percent evasion in derivatives trading (S1); no evasion (S2); and 50 percent evasion for derivatives (S3). Source: Own calculations of DIW Berlin, based on data from FESE, WFE, BIS statistical releases and Triennial Report 2013, ECB, World Bank, LSE, national financial agencies, and SIFMA. Tax revenue is expressed in billion EUR at 1 decimal place.

Market participants who must trade with the taxable securities are, however, obliged to pay the tax. A small investor investing long-term in a stock or bond in order to provide for himself in retirement would have no way to escape the tax, as an untaxed derivative would not constitute an alternative for this particular purpose. On the other hand, a financial institution or trading house that holds the shares only to profit from short-term performance trends probably could easily switch to a derivative contract for difference or other derivative instruments to achieve the targeted profit.[20]

Using trade data collected from Italy and France after the introduction of their respective FTTs, Coelho (2014) found an unusually high tax elasticity of -9 for high-frequency trading. The author traces this high figure back to a major shift of high-frequency trading into the non-taxable segments of the financial market, and the correspondingly lower sales in the taxable segment.

Figure 6-1
Correlation between tax revenue forecast and tax elasticity



Source: Calculations of DIW Berlin

Similar behavioral adaptions among market participants must be expected in the framework of enhanced cooperation in the event that only share trading is taxed. Due to the variety of possible avoidance responses (movements into untaxed market segments), the turnover in share trading will decline far more than could be explained solely through the elimination of the tax base from derivatives. Figure 6-1 illustrates how, in the case of Germany, the forecast of tax

[20] Such contracts for difference are banned in the United States but are widespread in Europe (Coelho 2014).

revenues in equity securities would have to be adjusted if the introduction of the FTT were connected with an increase in the tax elasticity. Using the data of the EU Commission's proposal—tax elasticity of -1 and an assumed evasion of 15 percent—the revenue amounts to 1,96 billion EUR. If the elasticity doubled after the introduction of the tax, the forecasted revenue would decrease to nearly 1,5 billion EUR, and it would drop to nearly half when the elasticity is tripled.

Empirically, an increased tax elasticity is indicated by a decline in sales following the introduction of the tax. Identifying the exact cause of the increased tax elasticity, however, is nearly impossible. For example, if an investment fund reduces the turnover rate in the actively managed investment portfolio, the elasticity increases and the revenue decreases, as in the case of the instrument arbitrage. Therefore, the decline in tax revenue caused exclusively by instrument arbitrage can hardly be identified and quantified.
An analogous problem arises when evaluating the observed decline in sales. While it is positive from a sustainability perspective if the turnover rate decreases, leading to a longer-term investment horizon caused by the FTT, instrument arbitrage is economically undesirable. With a broad tax base including derivatives, the probability of the occurrence of an FTT's undesired side effect can be reduced without affecting the incentive for long-term orientation.

7 Phase model endangers objective

The negotiations for the implementation of a financial transaction tax in the framework of enhanced cooperation focused for a while on a so-called phase model. A variant of the phase model consists of defining at the outset, during the negotiations, which financial instruments should be included in the final tax base, while imposing a tax rate of zero on certain financial instruments (for example, on some or all derivatives) in the initial stages. The time and manner for the "ignition" of the next stage could also be determined a priori.
A hypothetical tax base with a tax rate of zero for individual segments and a time-limited validity remains unresolved in terms of legality. It is clear, however, that the corresponding laws have yet to be created. It seems hard to deny that a phase model would significantly increase the hassle of implementation and adjustment for financial institutions. It follows from the previous statements that a phase model that does not include derivatives in the first phase will already have a significant impact on tax revenue through the reduction of the tax base. The danger of an erosion of the tax base in the segment of the first phase due to behavioral adaptations of market participants is evident. At the current stage of discussion, it is very likely that equity securities would be the first to be allocated a positive tax rate. In such a phase model,

however, it must be assumed with a relatively high probability that the "ignition” of the second phase will be unsuccessful. This would mean that equity financing would be put at a substantial disadvantage compared to other market segments. The financial transaction tax would thus be mainly borne by market participants who rely on equity financing and trade with this instrument, and not by those who use the financial systems for speculative reasons or "rent-seeking" (Emunds 2013). Considering the evidence that policymakers are in the position to learn the right lessons from the crisis, this would be fatal. These critical lessons should also include the insight that more risk-bearing equity financing is urgently needed in Europe.

8 OTC trading: Tax liability primarily affects “reporting banks” and “other financial institutions”

How individual groups of market participants are affected by the FTT can be determined by examining the respective shares in the transaction volume. However, it is not easy to get a sense of the FTT’s specific effects on banks, hedge funds, insurance companies, etc. Existing data on the counterparties usually provide only rough classifications. For example, the BIS divides the counterparties in many OTC derivatives transactions into only three categories: "reporting banks,” "other financial institutions," and "non-financial institutions.” There is no publicly available data at all on the counterparties in exchange-traded financial instruments.

"Reporting banks" ("reporting dealers") are financial institutions that regularly report trade data to the Bank for International Settlements or to the relevant central banks. The German Central Bank also mentions "market-leading banks” here. The BIS’s "other financial institutions" include, among others, the following market participants: other banks, institutional investors, hedge funds, high-frequency traders, central banks, and sovereign wealth funds. [21]

[21] Other financial institutions “include lower-tier banks, institutional investors (e.g. pension funds and mutual funds), hedge funds, high-frequency trading (HFT) firms, and official sector financial institutions (e.g. central banks or sovereign wealth funds)” (Rime and Schrimpf 2013).

Table 8-1

Share in the OTC currency exchange trading involving "other financial institutions"

		“Other financial institutions”				
	Share „other financial institutes“ (in total) (%)	**Non-reporting banks**	**Institutional investors (investment funds, Pension funds and insurances)**	**Hedge funds incl. high-frequency traders**	**Official sector (central bank and sovereign wealth funds)**	**Others**
In total	**53**	**24**	**11**	**11**	**1**	**6**
By location						
Centers in United Kingdom and United States	**63**	**26**	**14**	**16**	**1**	**7**
Asian centers	**26**	**14**	**6**	**1**	**1**	**2**
Centers in Australia, France, Germany, The Netherlands and Switzerland	**43**	**23**	**8**	**3**	**1**	**7**
Centers in other countries	**34**	**23**	**6**	**1**	**1**	**3**
By instrument						
Spot markets (non-taxed)	**58**	**25**	**13**	**14**	**1**	**5**
Forwards	**59**	**14**	**19**	**17**	**1**	**8**
Swaps	**45**	**27**	**7**	**5**	**1**	**5**
Options	**61**	**19**	**16**	**21**	**0**	**6**

Source: Rime und Schimpf (2013).

Since the 2013 Triennial Survey, the counterparties in the foreign exchange market have been recorded in finer detail by the BIS. According to the records, the "other financial institutions" group has now become the largest counterparty in the “reporting banks” segment (Rime and Schrimpf 2013). Overall, this heterogeneous group serves as a counterparty in 53 percent of the sales. Institutional investors are particularly active in the segment of over-the-counter currency forwards and currency swaps. Hedge funds and high-frequency traders trade currency options fairly often. The official sector barely plays a role in the OTC foreign exchange market.

Trade conducted by institutional investors and hedge funds is mainly concentrated in the trade centers of London and New York; more than 60% of the total turnover on the OTC currency market can be attributed to these two centers. Trade between "reporting banks" and

"other financial institutions" in these centers is ten times higher than trade between reporting banks and non-financial institutions (Rime and Schrimpf 2013).[22]

Table 8-2

Market shares in outstanding CDS volume

Market	CDS
Reporting banks	71%
Other financial institutions	
Banks/security firms	12%
Official sector (Central bank and sovereign wealth funds)	8%
Insurances	1%
SPVs, SPCs, or SPEs	2%
Hedge funds	2%
Others	3%
Non-financial institutions	1%

SPVs, SPCs, and SPEs (Special Purpose Vehicles, Special Purpose Companies, and Special Single Entities) denote off-balance sheet special-purpose entities with limited liability. They are often set up for the purpose of selling securitized, tranched, and graded blocks of securities.
Source: BIS (2014), http://www.bis.org/statistics/derdetailed.htm

For OTC interest rate derivatives, the BIS split the portfolio of outstanding volumes of credit default swaps (CDS) into various subgroups (Table 8-2). Under the assumption that the proportion of the outstanding volume corresponds to that of the total transaction volume, around 70 percent of the activity with CDS can be traced back to "reporting banks.” Insurances account for one percent and hedge funds for two percent of the outstanding volume as counterparties for the "reporting banks.” “Non-financial institutions" only account for one percent of the nominal volume as counterparties.

The BIS also makes available highly aggregated statistics on counterparties for all of the outstanding volumes of OTC derivatives (Table 8-3). In the case of interest rate derivatives, the number of “other financial institutions” serving as counterparties to reporting banks is the highest. In June 2014, the proportion had already increased to 82 percent, compared to only 64 percent two years earlier. The dominance of this group within interest rate derivatives also appears in the sales statistics, according to Gyntelberg and Upper (2013). At the time of the survey in April 2013, the proportion of "other financial institutions" serving as counterparties

[22] http://www.bis.org/publ/qtrpdf/r_qt1312e.htm

stood at 58% of total sales of OTC interest rate derivatives.[23] "Non-financial institutions," however, played a minimal role as counterparties.

Table 8-3

Shares in the outstanding volumes of the various OTC derivatives

OTC Interest rate derivatives					
Market	**Jun 2012**	**Dec 2012**	**Jun 2013**	**Dec 2013**	**Jun 2014**
Reporting banks	28%	24%	18%	16%	15%
Other financial institutions	64%	69%	75%	81%	82%
Non-financial institutions	8%	7%	6%	3%	3%
OTC foreign exchange derivatives					
Market	**Jun 12**	**Dec 12**	**Jun 13**	**Dec 13**	**Jun 14**
Reporting banks	44%	43%	42%	44%	43%
Other financial institutions	41%	43%	43%	43%	45%
Non-financial institutions	14%	14%	15%	12%	12%
OTC stock and commodity derivatives					
Market	**Jun 12**	**Dec 12**	**Jun 13**	**Dec 13**	**Jun 14**
Reporting banks	38%	34%	34%	32%	34%
Other financial institutions	50%	54%	54%	59%	56%
Non-financial institutions	11%	12%	12%	9%	10%

Source: BIS (2014), Tables 20A, 21A und 22A.

For OTC derivatives trading, it can thus be cautiously concluded that "reporting banks" and "other financial institutions" in particular are likely to be affected as taxable entities. "Non-financial institutions" hardly make an appearance in this area as counterparties, and therefore would hardly make an appearance as taxable entities either. Even such rather rough assessments of how they would be affected must be omitted for the actors in exchange trading, as no data on counterparties are publicly available for this segment.

9 Conclusion

The proposal of the French Minister of Finance Sapin from November 2014 was pushing for a complete departure from the EU Commission's concept for a comprehensive taxation of financial instruments. However, rejecting a broad tax base would lead to the deterioration of the tax revenue, and not only because part of the tax base would be missing: Changes in behavior also

[23] "This rather diverse group accounted for 58% of total turnover in April 2013, up from 46% in the previous survey." Gyntelberg and Upper (2013), p 71.

must be taken into account. The tax exemption for categories of financial instruments or the assignment of a rate of zero to individual financial instruments creates an incentive to shift trading activity into non-taxable segments.

The presented findings on potential tax revenues show that fiscal yield requires a broad tax base. This is especially true if low tax rates are to be imposed. The experiences with the existing Italian and French FTT models also make it seem doubtful that the FTT's original objectives—steering effect and adequate contribution from the financial sector to the costs of the crisis—are achievable using a phase model. As well, an initial step towards enhanced cooperation between EU countries in the fiscal area can only be expected if the selected model is credible. Credibility requires not only considerable revenues, but also the avoidance of undesirable incentives to instrument arbitrage.

Revenue estimates are only as good as the existing data records allow. The current data situation forces us considerably to bridge existing gaps in the data using appropriate assumptions. If turnover data and OTC transactions were broken down by stock exchange, the financial instrument's country of issuance, and the residency of the counterparties, such assumptions could, to a large extent, be eliminated. Therefore, it appears that measures to improve the financial transaction data are urgently needed. For example, it would be helpful, and a first step, if the Bank for International Settlements would require their banks to report a corresponding breakdown of reported OTC transactions. After all, forecasting reliability is of central importance not only in the run-up to the introduction of a financial transaction tax. It is also important for the subsequent evaluation of the FTT.

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Appendix: Summary of the French and Italian FTT studies

Characteristics						Results/Impact			
Author(s) of the Study	**Year of Publication**	**Observation Period**	**Taxed Enterprises (Treatment Group)**	**Control Group(s)**	**Method**	**Trading Volume (TV)**	**Volatility**	**Price/ Bid-Ask Spread**	**Elasticity**
EU Commission	2013	8/2011–2/2013	1) 108 large taxed companies 2) Subgroup of 35 large taxed companies of the CAC 40	1) DAX 30 companies 2) 40 Italian companies 3) 5 large non-taxed French companies from CAC 40 4) 33 medium non-taxed French companies Effect before and after the introduction of F-FTT	Difference-in-difference estimation	Period before FTT introduction: Decline in TV, with the exception of the Italian control group. Period after FTT introduction: Increase in TV for all taxed French companies, decrease in TV in the untaxed German DAX segment, increase in TV in the (not-yet-taxed) Italian segment. Entire observation period: TV in untaxed German DAX-segment shows a stronger decrease than does the TV in the French total taxable segment, but a weaker decrease than the TV in the taxable CAC 40 segment. Immediate decrease in TV when FTT was introduced among all taxable French companies, followed by increase in TV of the 108 taxed companies. The average monthly decline in TV of taxable CAC 40 companies between 08/2011 and 02/2013 is, however, less pronounced than of DAX 30 companies.	No (negative) effect; decrease in the volume of trade is not associated with an increase in volatility.	No (negative) effect on the price level.	

Characteristics						Results/Impact			
Author(s) of the Study	**Year of Publication**	**Observation Period**	**Taxed Enterprises (Treatment Group)**	**Control Group(s)**	**Method**	**Trading Volume (TV)**	**Volatility**	**Price/ Bid-Ask Spread**	**Elasticity**
Leonardo Becchetti, Massimo Ferrari, and Ugo Trenta (CEIS)	2013	90 trading days prior to and after the FTT-introduction	106 taxed French companies	220 non-taxed French companies	1) Statistical analysis of several taxed companies 2) Difference-in-difference estimation 3) Regression Discontinuity Design	1) Average daily turnover decreases after 90 days for 72% of the taxable companies. 2) In the taxed group as well as in the untaxed group, turnover decreases. However, this decrease is stronger in the taxable group (decrease is driven especially by the large companies).	1) Maximum price difference within a day ("intraday volatility") decreased significantly in most companies. 2) In the taxed group, there is a decrease in the maximum price difference. In the control group, the difference remains unchanged. Therefore, the estimate reveals a significant reduction in the volatility in the trading with shares of the taxed group.	1) Bid-ask spread (here interpreted as liquidity) does not change for most companies. 2) Spread remains unchanged in the taxable group, but is smaller in the control group. Comparative assessment after 90 days: No significant difference in the spread between the two groups.	
Jean-Edouard Colliard and Peter Hoffmann	2013	2 months prior to and 3 months after the FTT-introduction	Taxed French companies	Non-taxed Dutch and Luxembourg companies	Difference-in-difference estimation	Decline in TV in August by 32% relative to the control group (long-term decrease about 10%). High-frequency trading: less aggressive set of orders.	No significant impact on intraday volatility; informational efficiency of prices decreases relative to the control group.	No significant effect on bid-ask spread.	

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Gunther Capelle-Blancard and Olena Havrylchyk	2013	6 months prior to and after the FTT-introduction	106 taxed French companies (all listed at Euronext)	1) Small, non-taxed French companies 2) Foreign companies from Euronext 3) DAX companies traded at Deutsche Börse	Difference-in-difference estimation	F-FTT has reduced the TV of taxed enterprises compared to the control group.	No significant impact on various measures of volatility.	No significant effects on other measures of liquidity ("has not affected market liquidity, insofar as the market ability to trade large quantities without moving the price has not changed").	
Martin Haferkorn and Kai Zimmermann	2013	10 and 40 trading days prior to and after the FTT-introduction	36 taxed French companies from CAC 40	DAX 30 companies	Difference-in-differences estimation	Significant decline in the number of transactions, but not in the TV, relative to the German control group.	No impact on volatility.	Deterioration of the bid-ask spread compared to the German control group; decrease in order book depth.	

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Author(s) of the Study	**Year of publication**	**Observation period**	**Taxed Enterprises (Treatment group)**	**Control group (companies)**	**Method**	**Trading volume**	**Volatility**	**Price/ Bid-Ask Spread**	**Elasticity**
Stephan Meyer, Martin Wagener, and Christof Weinhardt	2013	40 trading days prior to and after the FTT-introduction	94 large taxed French companies (shares traded at Euronext Paris and Chi-X1)	99 companies (shares traded at London Stock Exchange) from the FTSE 100	Difference-in-difference estimation	Negative impact on TV and number of transactions compared with the period before taxation; decline in TV of the taxed companies relative to the control group in the two months following the introduction.		No effect on the bid-ask spreads.	
Maria Coelho	2014	June until December 2012 (France) and January until June 2013 (Italy)	Taxed French companies (shares traded at Paris stock exchange); taxed Italian companies (shares traded at Milan stock exchange)	1) French and Italian non-taxed comp. 2) American Depositary Receipts (ADRs) 3) Dutch and Belgian comp. (control group for France) and Spanish companies (control group for Italy)	Difference-in-difference estimation	Decline in TV in France after the FTT-introduction, but no decline in Italy. OTC trading is temporarily lower in France and permanently lower in Italy (Italy: double tax rate for OTC trading).	No effect on volatility.		Negative impact on the tax elasticity for non-HFT transactions in shares. Particularly high tax elasticity after the introduction in HFT transactions with shares: -9.

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Till Hannig and Oliver v. Schweinitz	2015	No data used.			Analysis of legal risks and tax collection problems.	Differences between income estimate and actual tax revenue is reported. Negative effects on liquidity are cited. Decline in Italy is estimated at 45% until August 2013, but non-taxed companies are also affected by the decline.
Thiess Büttner and Katharina Erbe	2015		Investigation covers Germany only.	No control group.		Hypothetical tax gap of a possible FTT is analyzed and quantified. Alternative taxation of the financial sector is discussed.

[1]Chi-X is a multilateral trading system..