Oxera

What could be the economic impact of the proposed financial transaction tax?

A comprehensive assessment of the potential macroeconomic impact

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Executive summary

Oxera has been involved in the debate about the proposed financial transaction tax (FTT) for Europe since the European Commission first presented its proposals in September 2011. Oxera has consistently called for more and better research to be conducted into the potential economic impact of the FTT, as there are reasons to believe that the economic impact is likely to be more detrimental than the Commission assumes. In particular, there is a significant risk that the imposition of the FTT actually worsens overall government finances, as it has a negative impact on other tax revenues from the economy, and increases the cost of funding government debt.

Commissioned by Marex Spectron, a leading broker of financial products in the commodities sector, and building on Oxera's previous work, this independent study provides a coherent framework to analyse the mechanisms through which the FTT would affect economic activities. The study seeks to further the understanding of the impact of the proposed FTT by addressing two important gaps in the existing literature which result in the need for:

– quantitative estimates of the economic impacts that seek to take into account the potential impact of the tax on trading behaviour, particularly regarding the volume of trading with the tax in place;

– independent estimates of the broader macroeconomic impact of the tax, bringing together the wide range of economic impacts into a single consistent and comprehensive appraisal.

This Oxera study provides findings that seek to address these important gaps in the existing research.

How would the FTT affect the economy?

Oxera finds that the proposed FTT would have a severe economic impact relative to the amount of revenue that it would raise. How the FTT would negatively impact the European economy is set out below.

The proposed FTT would cover a broad range of financial transactions between different counterparties trading different instruments. In general, the FTT would raise the cost of trading for all parties involved, which can be expected to result in some trades no longer being conducted because their economic value to the trading parties is insufficient to justify the payment of the tax. In the simplest terms, therefore, the economic impact of the tax is equal to the sum of:

– the burden of the tax on those transactions that continue, and bear the tax; and

– the economic impact of transactions no longer being conducted.

The costs of financial transactions must be reflected in the gross returns expected by end-users. Consequently, the FTT would be expected to increase the cost of equity and debt to issuers, including the funding cost for government debt and borrowing costs for businesses. The evidence suggests that financial intermediaries do not absorb the cost of taxes such as the FTT, but instead pass those costs on to customers—the end-users of financial services. The cost of financial transactions conducted by intermediaries is therefore passed on to end-users, and hence any 'cascading transactions' could further increase the cost, and therefore the economic impact of the FTT. The European Commission have attempted to mitigate this

issue by suggesting that financial institutions acting 'in the name or for the account of' another financial institution would be exempt, but market-making activities and other transactions required by financial intermediaries in order to facilitate end-user transactions remain within the scope of the tax.[1] Consequently, there will often be more than one taxable transaction involved to achieve a single transaction between end-users. The FTT would also increase the costs of a wide range of activities undertaken by real economy participants, including households and businesses, who obtain products and services from the financial system. For example, the taxation of derivative transactions would result in increased costs to corporates of conducting risk management activities, and increased bank lending rates to all customers (including households). Taxing repurchase agreements ('repos') would be likely to substantially disrupt the short-term repo market, with materially negative implications for bank funding, corporate cash management, and financial stability. This would, in turn, increase the costs incurred by financial institutions in providing financial services to end-users.

In addition, the FTT would create further distortions in the European Union economy by encouraging transaction activity to shift away from the FTT-zone,[2] thereby reducing the net financial services exports of affected (i.e., FTT zone) economies to the relative benefit of non-participating economies.

Importantly, the recent (September 2013) discussion by the EU Council legal service[3] that the proposed FTT could exceed national jurisdiction, 'infringes' on EU treaties and 'is discriminatory' to non-participating states suggests that any future FTT proposals will need to be scaled back, perhaps to be more like the existing national financial transaction taxes in France and the UK.

The various impacts identified in the conceptual framework are assessed in the following sections of the report. For each component of the economic impact, Oxera has developed a counterfactual scenario for the amount of trading that can be expected with the FTT in place, assessing likely behavioural changes. This counterfactual scenario is used to estimate both the burden of the tax and any costs arising from reductions in transaction activity or relocation of transaction activities outside of the FTT-zone.

Cost of funding business investment

The FTT would create an additional wedge between how much the borrower (eg, a corporation or a government) has to pay in return for financing, and what the investor expects to receive.

The tax would therefore either increase the cost of funding for companies and governments or reduce the returns to investors, with the relative distribution of the cost depending on the ability of investors to find equivalent investment opportunities outside the range of affected instruments/issuers (i.e., thereby allowing investors to avoid the FTT, while preserving investment returns). Increasing the cost of funding of investments in the real economy would lead to reductions in that investment and therefore long-run reductions in GDP. While this is not the only route through which the FTT would affect the wider economy, it is one of the most important channels, and therefore forms a core part of Oxera's assessment of the economic impact.

Oxera estimates that the impact of the FTT on the cost of tradable debt instruments (including both government and corporate bonds) in the FTT-zone would be an increase in

[1] See section 3.3.4 of the European Commission 'Proposal for a Council Directive' Com(2013) 71 final, February 14th 2013. This issue is discussed further in section 3 of this report.

[2] The FTT-zone refers to the 11 EU Member States that are proposing to introduce the FTT to their financial markets, which are Austria, Belgium, Estonia, France, Germany, Greece, Italy, Portugal, Slovakia, Slovenia, and Spain.

[3] As reported (including the original document) by the Financial Times on September 10th 2013. See http://www.ft.com/cms/s/0/b0a6c7a8-19fd-11e3-93e8-00144feab7de.html?siteedition=uk&siteedition=uk#axzz2f9mNEqVZ

the annual yield (the cost of debt) of 0.4 percentage points. Oxera expects that there would be a marked decline in sovereign debt transactions, resulting in FTT revenues that are lower than the European Commission expects.

Oxera estimates a similar impact of 0.4 percentage points for the cost of equity (similarly expressed as an annual rate of return), based on different assumptions. This estimate lies in the middle of the range of estimates based on other sources (0.3–0.5 percentage points) and corresponds to the estimates in the Commission's own research.

Hedging

The financial system also involves many financial derivative transactions that are conducted by both financial and non-financial institutions in order to provide products to retail and business customers in an efficient manner. These transactions arise due to both financial institutions hedging positions to assist in the provision of financial products and non-financial institutions hedging financial positions in order to manage their own financial risk.

Based on realistic assumptions and an innovative approach, Oxera estimates that the cost of the FTT applied to derivatives transactions for non-financial corporations would be €4.8 billion per annum. The cost of the FTT applied to derivatives transactions for standard banking products is estimated to be €13.1 billion per annum (this can be translated into an increase in bank lending rates by around 0.18 percentage points). The FTT would also create additional costs for the provision of other financial services, such as insurance and retail investment products.

The Commission's revenue expectation of €21 billion per annum from taxing derivatives transactions is broadly consistent with the findings of this analysis, but there remains a high degree of uncertainty over the final outcome, as the impact on both the absolute reduction in derivative transactions and the location of that transaction is uncertain.

Importantly, taxing derivative transactions can have further knock-on economic implications if it discourages risk management activities (eg, hedging) and therefore results in greater volatility and uncertainty for borrowers, financial institutions and investors. This additional volatility and uncertainty will also discourage investment or, if the investment still goes ahead, will increase the cost of funding that investment.

Repurchase agreements

The sale and repurchase ('repo') market is an important part of the 'plumbing' underlying the operation of the financial system, helping financial institutions to access liquidity, and repos are used as part of central bank operations.

The Commission's impact assessment assumes that all repos are replaced by secured lending (ie, without the transfer of the collateral to the lender) which is untaxed, and that this change has no additional cost. There is a cost to this, however, as secured lending is a more risky process. Oxera therefore does not consider the Commission's prediction to be robust and has instead considered a more nuanced and realistic process, given the FTT.

Oxera has developed a simple methodology for assessing the impact of taxing repos based on the requirements of standard banking operations, taking the cost of the tax for longer-term repos that continue to be used and the cost of the loss of access to liquidity arising from reduced use of shorter-term repos.

There is a substantial cost to the economy through higher costs for financial institutions. Based on relatively transparent assumptions and publicly available data, Oxera provides an indicative cost estimate for the current users of repos, equal to €11.5 billion per annum. This estimate represents a cost to the wider economy arising both from the direct burden of the tax (the revenues collected) and the cost arising from the (extensive) reduction in the use of repos due to the imposition of the tax.

Relocation of financial transaction activity

The loss of financial transaction activity could also have a more direct impact on economic output in the FTT-zone if activity relocates to non-FTT countries in order to avoid the tax in full or in part. Companies in the FTT-zone countries would increase their use of financial services located abroad, which would represent an increase in imports (of financial transaction services) from abroad.

The extent to which the FTT encourages financial services firms to relocate is highly uncertain, but the evidence suggests that derivatives transactions tend to be the most mobile and therefore most likely to shift out of the FTT-zone, even if some or all of the end users of derivatives that are being traded are located in the FTT-zone. To illustrate the potential macroeconomic impact of the relocation of derivative transactions, Oxera has modelled a net export loss for the financial services sector in the FTT-zone. As the trading of derivatives is expected to relocate outside of the FTT-zone, to minimise the burden of the tax, jobs and profits associated with the provision of transaction services will also shift outside of the FTT-zone, which in this report was modelled as a €6.5 billion loss of net exports by the FTT-zone.

Financial stability

One of the stated aims of the proposed FTT is to improve financial stability. Oxera has reviewed the relevant evidence on this, including from the Commission, and concluded that there is little evidence to support the claim that the FTT would increase financial stability. Instead, there are reasons to be concerned about specific impacts of the FTT, which could actually reduce financial stability and undermine recent regulatory efforts to make the financial system safer.

In particular, the FTT would be likely to severely affect the short term repo market, which has important functions in the financial system, and therefore could affect financial stability. The FTT would also be likely to encourage non-cleared, non-collateralised transactions to be conducted between end-users over-the-counter (OTC) rather than though an exchange and CCP (central counterparty), in order to minimise the number of incidences of the tax. This would go against European Commission's objectives to encourage market participants to clear their transactions through a CCP.

Impact on public finances

The primary focus of this report is the potential impact of the FTT on the wider economy and consequently the state of the public finances. The analysis summarised above examines the main channels through which the FTT can affect the wider economy. Oxera used these effects to estimate the overall impact on public finances, by teaming up with macroeconomic modelling experts at Oxford Economics.

In this report, Oxera finds that the FTT would be a very inefficient tax indeed, as the long-term net impact of the tax on public finances could actually be negative. For those countries with relatively high levels of government debt, the loss of government revenues, due to the impact of the tax on the economy and government funding costs, is estimated to be greater than the expected revenues from the FTT. This means that the FTT could ultimately result in further reductions in public spending in those countries.

This severe impact on the state of public finances is summarised for France, Germany, Italy and the total for the eleven FTT-zone countries in the table below. The revenues that the FTT collects (the first data column of the table) will be partially offset by the loss of revenue from other forms of taxation (the second column), due to the negative economic impact of the tax. But the public finances will also be negatively impacted by the increase in the cost of funding government debt that results from the FTT (the third column).

The long-term net impact on public finances could therefore actually be negative, which would be a very poor result for the introduction of a new form of taxation. The analysis

presented in this report estimates an overall loss of €4 billion per annum, as the FTT revenues are more than offset by the loss of other tax revenue and the increased cost of funding government debt. But the impact would be relatively more severe for those countries (such as Italy, shown in the table) which have high levels of government debt relative to GDP. According to these results, the heavily-indebted countries would see an overall negative impact on public finances, whilst less indebted countries (such as Germany and France) may see an overall positive impact on public finances.

Estimated impact on public finances (€ billion per annum)

	FTT revenue	Loss of other revenues	Increased cost of funding government debt	Net impact on public finances
France	12	2	7	**+2**
Germany	16	5	9	**+2**
Italy	9	6	8	**–5**
FTT-zone	**51**	**22**	**33**	**–4**

Source: Oxera and Oxford Economics analysis, drawing on Eurostat data for government debt and GDP.

The estimate above has also ignored some additional negative impacts where the direction of the impact is well established, but the magnitude is less well established. In particular, the impact on the cost of capital for firms as a result of the reduced liquidity of their equity securities is not taken into account. This would reduce GDP further, and increase the loss of other taxes, so increasing the net loss to public finances.

Impact on the cost of financial products

The effect on households and businesses is more than just the impact on public finances. The FTT would also increase the cost of standard financial products. Oxera finds that:[4]

– on average, bank lending rates would rise by around 0.2 percentage points; to put this into perspective, a small business borrowing €100,000 which is repaid steadily over ten years would have to pay an additional €1,200 in interest due to the FTT;

– a two-year fixed-rate mortgage would cost a further €80 to arrange, in addition to current arrangement fees and interest;

– the cost of providing minimum-return guarantees for retail investment products would also rise significantly. Oxera estimates that the FTT on a standard investment product could add up to 0.6% a year to the cost where there are minimum-return guarantees. The total returns on a ten-year investment could therefore be reduced by 9% of the original investment (eg, a €90 reduction in returns from a €1,000 investment).

[4] See section 4.3 for details of the calculations.

The FTT would have a wide range of additional negative economic impacts. While this report seeks to estimate the most tangible impacts for the wider economy, there are likely to be additional, less tangible, effects as the tax reduces the efficiency of the financial system. Even the more tangible impacts assessed by Oxera show that the negative economic implications of the FTT would outweigh any benefits in terms of revenues collected. The estimated overall impact on public finances by itself should be reason enough for policy-makers to conduct significant further research into these proposals to ensure that they are in the public interest and are consistent with the overall objectives of the European Community before any tax is put in place.

Alternative proposals for an FTT

The Commission's proposals for an FTT are not the only option available, the Commission's proposals aim to provide a structure that allows individual national governments to introduce similar taxation in the different participating countries. Consequently, any tax would be introduced separately by national governments and could vary in the detail of what tax is actually imposed (for example, the precise scope of the tax base). Furthermore, other bodies have suggested various alternative forms of the tax. For example, the European Parliament suggested amendments to the proposals at the end of June 2013 (see section 1.2 for further details).

The economic impact of an FTT would vary according to how it is designed and the burden of the taxation on end-users of financial services. But regardless of how the tax is designed, Oxera's research finds that any tax on financial transactions is likely to be inefficient in the sense that the negative impact of the tax on economic output is likely to be large relative to the revenues collected.

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1 Introduction

1.1 European Commission proposals for a financial transaction tax

On September 28th 2011, the European Commission adopted a proposal for a financial transaction tax (FTT) that would tax financial institutions conducting transactions in equities, bond and derivatives.[5] [6] The Commission proposed a tax rate of 0.1% of the value of the security for equities and bonds, and 0.01% of the notional value in the case of derivatives. In most cases, it also proposed that the tax apply twice to each transaction—both the buyer and seller pay the tax if they are both financial institutions.[7] The proposed tax is summarised in Box 1.1 below.

The Commission's original proposal in 2011 included an impact assessment, which estimated the revenue and macroeconomic impact of the tax. The Commission subsequently published further impact assessment research in June 2012[8] and in February 2013.[9]

Oxera has been involved in the debate about the FTT from the start. In December 2011, Oxera reviewed the Commission's initial impact assessment with a focus on what the Commission's assessment would suggest for the macroeconomic impact if more reasonable assumptions were used.[10] Oxera also reviewed both the June 2012[11] and February 2013 economic impact research.[12]

Consistently throughout these critical reviews of the Commission's analysis, Oxera has called for more research to be conducted into the potential economic impact of the FTT. There are reasons to believe that the economic impact is likely to be materially more detrimental than the Commission assumes. There is a significant risk that the imposition of the FTT actually worsens government finances, as it affects other tax revenues from the economy and the cost of funding government debt.

These findings were made on the basis of reviewing the Commission's analysis, and identifying important gaps, particularly where the Commission has not taken into account the negative economic impact of deterring financial transactions that bring benefits to the wider economy. As discussed in section 1.2 below, commentators have identified important financial activities that will be made uneconomic by the tax, which would have implications

[5] The analysis of this study considers the full scope of the European Commission proposals, rather than subsequent reduced scope proposals of other parties. The analysis was conducted up to the end of 2013.

[6] See European Commission (2011), 'Proposal for a Council Directive on a common system of financial transaction tax and amending Directive 2008/7/EC', COM(2011) 594 final.

[7] It should be noted that that the definition of financial institution is wide, and includes banks, other credit institutions, insurance companies, pension funds, UCITS collective investment funds and their managers, Special Purpose Vehicles, etc.

[8] European Commission (2012), 'Technical Fiche: Macroeconomic impacts', May.

[9] European Commission (2013), 'Implementing enhanced cooperation in the area of financial transaction tax: Analysis of policy options and impacts', Staff Working Document SWD(2013) 28 final, February, available at http://ec.europa.eu/taxation_customs/resources/documents/taxation/swd_2013_28_en.pdf.

[10] Oxera (2011), 'What would be the economic impact of the proposed financial transaction tax on the EU?', prepared for the Association for Financial Markets in Europe, the Italian Association of Financial Intermediaries and the Nordic Securities Association, December.

[11] Oxera (2012), 'What would be the economic impact on the EU of the proposed financial transaction tax? Review of the European Commission's latest commentary', June. Available at www.oxera.com

[12] Oxera (2013), 'Analysis of European Commission staff working document on the proposed Financial Transaction Tax', May, available at www.oxera.com.

that are not being assessed.[13] However, there is a lack of quantitative analysis of the potential negative consequences of these impacts as they were not included in the Commission's analysis.

Box 1.1 Summary of the proposed financial transaction tax

At the June 2012 meeting of the Council of Economic and Financial Affairs, a number of EU Member States made it clear that they did not wish to adopt a pan-EU FTT. Subsequently, 11 Member States decided to pursue the introduction of a common FTT under the procedure of 'enhanced cooperation'. The 11 Member States were Austria, Belgium, Estonia, France, Germany, Greece, Italy, Portugal, Slovakia, Slovenia, Spain (referred to in this report as the FTT zone).

The proposals for the FTT are still under development, and in its February 2013 Staff Working Document (SWD) the Commission suggested further refinements.[14] Table 1.1 summarises the main elements of the proposals from the point of view of an economic impact assessment.

Financial institutions would be liable to pay the FTT, with the definition of 'financial institution' expected to be broad and to include pension funds and some large non-financial corporations, as well as banks, insurers, hedge funds, UCITs and other retail and institutional collective investment schemes. Any transaction involving a buyer or seller resident in the FTT-zone would be liable, including for trades between an FTT-zone non-financial institution and a non-FTT zone (eg, UK) financial institution.

Table 1.1 Proposed FTT rates per transaction

	Buy side	Sell side	Tax base
Equities	0.1%	0.1%	Security value
Bonds	0.1%	0.1%	Security value
Derivatives	0.01%	0.01%	Notional value
Repos	0.1%	0.1%	Collateral value. A repo is treated as one single transaction (not two transactions)

Source: Oxera.

This lack of quantitative analysis suggests that there is a need for a comprehensive assessment of the various impacts of the FTT on the wider economy (including tax revenues), which **takes account** of both the direct and knock-on impacts on the economy via the effect of the tax on transaction activity in various segments of the financial system, including with respect to derivatives, repos, government debt and equity.

Marex Spectron, a leading broker of financial and physical products in the commodities sector, commissioned Oxera to conduct the independent study described in this report, in order to research the economic impact of the FTT to begin to address these important gaps in understanding.

1.2 Alternative proposals for an FTT

The European Commission's proposals for an FTT have changed somewhat over time, with a succession of reports providing both additional detail and modifications to the original proposal (although uncertainty on some important details still remain). This report focuses on the proposals suggested by the latest Commission documents published in February 2013.

[13] An example of this are repos, which financial institutions use to access liquidity and which have an important role from the point of view of central banks conducting monetary policy. However, the Commission does not assess the negative impact of deterring these activities, even though it accepts that short-term repos will become uneconomic (see section 5 for details).
[14] European Commission (2013), op. cit.

There are alternative proposals, of course. Whilst this report focuses on the Commission's proposals, the analysis has been conducted separately for different elements of the tax, which supports consideration of the potential impact of different proposals. It should be noted that Italy and France have both introduced some form of FTTs since the publication of the original Commission proposal, and that in each country the scope of each tax is narrower, in terms of both affected instruments and the incidence of the tax on participant activity (e.g., some or all intermediaries are exempt).

One recent set of alternative proposals was provided by the European Parliament. At the end of June 2013, the Economic and Monetary Affairs Committee of the European Parliament proposed a number of amendments to the Commission's proposals following a debate by MEPs. These proposals included:

– the inclusion of spot foreign exchange (FX) transactions within the tax base; the Commission explicitly excluded the inclusion of spot FX transactions on the legal basis that it would conflict with the free movement of goods within the European Union, and the Commissioner for Taxation, Algirdas Semeta, has subsequently confirmed that this option is not available under EU law;[15]

– the exclusion of market-making activities, although there was some recognition by the European Parliament of the Commission position that these need to be included in order to remove an important loop-hole in the application of the tax (see section 2.3 for further details on the value of market-making); and

– the inclusion of cancelled orders made when engaging in high-frequency trading; this would clearly discourage high-frequency trading strategies, although at least some of these strategies are likely to become uneconomic within the FTT-zone due to the Commission's own proposals, suggesting little overall change in the economic impact (see section 8.2.1 for a discussion of the relevance of high-frequency trading to the wider economic impact).

The Commission also responded to the European Parliament debate by suggesting that certain other elements of the debate should be considered for future amendments to the proposals, including:

– the introduction of different FTT rates for specific segments of the market and specific transactions, according to judgments about their role in the financial services sector; this might suggest using differential tax rates as a form of regulatory tool;

– no additional exemptions are proposed, but transactions involving government bonds and/or transactions made by pensions funds could be taxed at reduced rates;

– intra-group transfers to be examined in more detail as exemptions could create loopholes; and

– the avoidance of SMEs (outside of the financial services sector) being categorised as financial institutions, even if the proportion of financial activity to total activity (one of the measures proposed for identifying financial institutions) appears to be relatively high.

Ultimately, any country adopting proposals for an FTT would implement the tax at the national level, and therefore may alter the precise application of the tax in some way, subject to the requirements of the proposals. This could include higher rates of FTT, for example. An assessment of the economic impact at the national level would therefore be required once these details are known.

[15] The economic impact of taxing spot FX transactions is not included in this report due to it conflicting with EU law. It can be assumed to have a negative impact on economic trade and therefore growth.

The European Parliament discussion reflected a shift in focus towards forms of taxation more similar to those introduced by France and Italy, which exempt financial institutions acting as intermediaries to some degree. This change in emphasis is also reflected in the Commission's latest statements about 'cascading' transactions, which are discussed in section 2.3 below. To the extent possible, Oxera has taken account of this change in focus in the analysis, in order to ensure that the analysis is focused on the latest form of the proposals for what still remains a proposal for a form of taxation rather than clearly defined taxation principles.

1.3 Existing research on the potential impact

Since the European Commission published its original proposals for an EU-wide FTT, many other organisations have published research into the proposed tax. This report draws on this wide body of research (as well as conducting new analysis), as this research covers many but not all of the areas of the economy that are likely to be affected.

In general, existing research tends to look at specific areas of impact, with the primary focus being on financial markets rather than on the wider economy. Research findings tend either to be qualitative or to provide quantitative estimates based on current levels of transactions. These findings typically ignore likely changes in trading behaviour due to the tax. This omission represents an important limitation given that transaction levels are likely to change markedly in many areas, resulting in both lower tax revenues, as well as negative economic consequences arising from the loss of transaction activity.

1.4 Gaps in the research

This study seeks to add to the existing literature on the proposed FTT, including Oxera's past work, by focusing on two important gaps in the existing research:

– quantitative estimates of economic impacts that seek to take into account the potential impact of the tax on trading behaviour, particularly regarding the volume (and location) of the transactions that remain with the tax in place;

– independent estimates of the broader macroeconomic impact of the tax, bringing together the broad range of economic impacts into a single consistent and comprehensive appraisal.

This Oxera study provides findings that seek to address these important gaps in the research. Each of the gaps is discussed in further detail below.

1.4.1 Changes in transaction behaviour

The FTT is likely to make some existing transactions uneconomic, which suggests that, with the FTT in place, those transactions will no longer occur (at least within the FTT-zone). In some cases, there could be a marked reduction in transaction levels, and the Commission itself, for example, assumes a 75% drop in derivatives transaction levels.

It is therefore vital to take this into account in an assessment of the macroeconomic impact. When calculating the expected tax revenues, the Commission uses assumptions for transactions reduction. However, its macroeconomic impact assessment is based purely on an impact on the cost of equity, and the volume of cash equity transactions is expected to be less affected by the tax than transaction volumes in other instruments.[16]

[16] See section 3. To assess the tax revenues, the Commission assumes a 30% decline in equity trading. This seems to be broadly consistent with findings on the impact of the French FTT introduced in 2012.

Other commentators have looked at the burden of the tax on end-users, considering 'cascading transactions'[17] (see section 2 for examples), but generally assuming that the current amount of these transactions continues with the FTT.[18] This assumption makes sense only if the value of market liquidity produced by cascading transactions exceeds the cost of the tax, which is unlikely to be the case in a number of examples, particularly for government bonds and derivatives. More likely is that end-users choose to accept lower liquidity (eg, slower transactions and/or higher market impact) in order to reduce the cost of the tax. But lower liquidity also creates an additional risk and therefore cost for investors, which an economic impact assessment must take into account.

In this study, Oxera develops assumptions for the level of transactions with the FTT, with a view to taking account of possible behavioural changes. It is impossible to know for sure at this stage how the FTT might affect transactions volumes, given the enormous uncertainties involved, but the importance of behavioural changes means that sensible assumptions are required. These assumptions are set out clearly in this report based, where possible, on observations of relevant past changes in volume as a result of changes in the costs of transactions, to provide transparency on how the findings have been developed.

1.4.2 Macroeconomic impact

Notably, only a few commentators have sought to estimate the broader macroeconomic impact of the tax. Available estimates of the impact on GDP include those produced by the Commission and by the Netherlands Bureau for Economic Policy Analysis (CPB). The impact on GDP was considered in Oxera (2011) and Oxera (2012), but these estimates were based on the Commission's model, adjusted for more reasonable assumptions.

The Commission's macroeconomic impacts are based on a theoretical model of the economy which, while conforming with standard approaches, does not allow for analysis of short-term trends or current economic conditions. Importantly, its approach models the impact on corporate funding through equity only, and does not consider how taxing derivatives, repos or bonds could affect the economy. Consequently, there is the need for independent research into the macroeconomic impact that takes account of a much broader range of impacts and is based on a tried-and-tested (and highly respected) macroeconomic model that is used for forecasting purposes and therefore provides information on potential short-term dynamics.

For this study, Oxera therefore teamed up with macroeconomic economic forecasting specialists, Oxford Economics, to estimate the macroeconomic impacts. Oxford Economics maintains a global macroeconomic model that captures a vast range of transmission mechanisms and other macroeconomic dynamics that are not included in the Commission's analysis.

1.5 Structure of this report

This report is set out as follows:

– section 2 describes the conceptual framework for assessing **how the FTT would affect the economy**;

– section 3 examines the impact on the **cost of funding**;

– section 4 assesses the impact of tax derivatives on **hedging** activities;

[17] Transactions between financial institutions that are required in order to achieve efficient (liquid) transactions between end users.

[18] For example, the analysis by Clifford Chance is widely quoted, but the assumption in that analysis is that the total volume of transactions remains the same. See, for example, Clifford Chance, client briefing September 2011: http://www.cliffordchance.com/content/dam/cliffordchance/PDF_2/Client_Briefing_The_Financial_Transaction_Tax.pdf

– section 5 consider the impact on **energy markets**;

– section 6 considers the impact from taxing **repurchase agreements**;

– section 7 considers the possible **relocation of transaction activity**;

– section 8 assesses the potential impact on **financial stability**;

– section 9 brings the analysis together in an assessment of the **impact on the wider economy**;

– section 10 appraises the **Commission's impact assessments**; and

– section 11 provides **recommendations for refining the proposals**.

2 How would the FTT affect the economy?

The proposed FTT would cover a broad range of financial transactions between different counterparties transacting different instruments. Many of these transactions are currently conducted by financial institutions transacting on markets, rather than end-users of financial services. The FTT would raise the cost of financial transactions for all parties involved, which can be expected to result in some transactions no longer being conducted as the economic value of those transactions to the involved parties is not sufficient to justify the payment of the tax. In the simplest terms, therefore, the economic impact of the tax is equal to the sum of:

– the burden of the tax on those transactions which continue and bear the tax; and

– the economic impact of transactions no longer being conducted.

The Commission has suggested that a large proportion of financial transactions are not necessary for the efficient functioning of the financial services sector, from the point of view of the wider economy.[19] In its impact assessment, it therefore suggests that the introduction of the FTT (which will raise the cost of transactions) will simply result in a reduction of transactions between financial institutions without any wider economic implications.

In order to assess the economic impact of the tax, a clear and robust conceptual framework is required to understand both the role of financial transactions in the economy and the value of those transactions. This framework provides the basis for estimating what transactions would be likely to continue (i.e., where the value of transacting exceeds the cost burden of the tax), and what transactions (still with positive underlying value) would cease. The framework discussed below considers:

– the role of financial transactions in the economy;

– the impact of an increase in transaction costs;

– the likelihood of the financial services sector absorbing increased costs;

– the impact on other costs in the financial system;

– where the main impacts are likely to occur.

Section 2: Key findings

– Financial transactions are vital for effective financial intermediation, which is, in turn, a vital function for the wider economy.

– The costs of financial transactions are reflected in the returns expected by investors. Consequently, the FTT would be expected to increase the cost of equity and debt.

– The evidence suggests that financial intermediaries do not absorb the cost of taxes such as the FTT, but instead pass that cost on to customers such as companies and investors—the end-users of financial services. For many transactions, the burden of the tax will be much greater than the profit that a financial intermediary could currently reasonably expect to realise on such a transaction (e.g., via the bid/offer spread). As such, it is simply not be possible for financial intermediaries to absorb the cost of the

[19] See the introduction to section 4 for the Commission's quoted statements.

tax.

– The cost of financial transactions conducted by intermediaries is therefore passed on to end-users. If multiple 'cascading' transactions are subject to the tax, the effective tax burden included in the price to the end users will be multiples of the headline rates, as the cost of the tax from all of the transactions will be passed on to them.
– The FTT will also increase other costs in the financial system, primarily through the taxation of derivative transactions, which will result in increased costs of corporates conducting risk management activities and increased bank lending rates.

2.1 What is the role of financial transactions in the economy?

The primary role of financial transactions for the wider economy is to channel funds from those wishing to invest (lenders) to those wishing to borrow (borrowers). This includes a bank taking deposits from savers in order to lend to people wishing to buy a house, as well as the stock market facilitating the transfer of funds from investors to companies through shares.

Financial transactions include many different types of financial instruments, including equities, bonds, derivatives and repos. Some of these instruments, such as derivatives, do not directly transfer funds from lenders to borrowers (in the way that equity does, for example), but instead allow lenders and borrowers to achieve the financial position they desire. For example, an investor may wish to invest in a bank but at the same time limit their exposure to the risk that the bank may default, and therefore they could buy the bank's bonds and the relevant credit default swap (a derivative that provides insurance against default). The benefits of derivatives have been well-documented in the literature (see Box 4.1 in section 4).

More generally, financial intermediation provides a number of functions, including:

– maturity transformation: converting short-term liabilities (such as deposits) into long-term liabilities (such as mortgages);

– liquidity transformation: converting illiquid assets (those that are not easily converted into cash, such as houses) into liquid assets;

– risk transformation: converting risky investments (eg, a loan to an SME) into relatively risk-free ones (eg, deposits);

– matching: pooling small investments into larger investments and linking lenders with borrowers.

While the financial system can be quite complex and involve many different parties transacting in many different instruments, the overall role in the economy is relatively clear. Suppliers of funds may have different needs (eg, in terms of investment maturity and liquidity) than borrowers, and the financial system provides the required transformations.

Financial intermediation is a vital function for the wider economy.

2.2 Who pays for financial intermediation?

The financial system does not provide the services of financial intermediation to end-users free of charge. The channelling of funds from investors to companies and governments incurs costs, and one set of these costs are the transaction costs that arise in trading securities. For example, when an investor buys a share in a company or a government or corporate bond, transaction costs can include:

– explicit costs, such as brokers' fees (which typically include the cost of transactions on an exchange and cover some of the post-trading activities);[20]

– implicit costs, typically represented by the bid/ask spread, which is the difference in the price that the investor expects to pay for shares compared with the price it expects to sell them for.

An investor buying a security today will typically expect to pay transaction costs in the future, when the security is sold. They will therefore factor these future transaction costs into the price they are willing to pay for the security. If the expected future transaction costs increase—for instance, due to the introduction of an FTT—the price of the security will fall. A lower price means that the expected return to the security relative to its price (which defines the cost of capital) will rise. This means that the tax does affect the return and that the FTT would affect the price of securities at issuance, even though the proposed FTT exempts primary issuance from the tax. The investor may not be taxed at issuance, but still expects to be taxed later.

For example, if an investor purchases a ten year corporate bond at issuance, they are expected to be exempt from the FTT as the primary market is exempt. However, if there is any possibility that they may sell the bond before redemption,[21] which would typically be the case, then they will need to factor in the cost of the FTT in the future. This expectation of a future cost will reduce the investors willingness to pay for the bond at issuance, which in turn means that the corporate will have to offer a higher coupon (and hence a higher yield) in order to raise the required amount of finance.

The burden of the tax would therefore fall on the company and to some extent investment would be discouraged, which is assessed in the macroeconomic modelling (see section 9).[22]

The extent to which an increase in transaction costs results in a fall in the price of a security depends on the price elasticity of demand for the security. As with goods and services, company-specific price elasticities of demand tend to be higher (and often much higher) than market-wide elasticities. This means that if the transaction costs rise only for a single security then the price will be expected to fall until such a point that the increase in the relative return compensates the investor in full for the future transaction cost. This is because the investor has many other near-identical alternative investments to choose from.

On the other hand, if future transaction costs rise for all investments, as may be expected given the FTT, the (market) price elasticity of demand will typically be lower. This means that investors will essentially absorb some of the cost. Security prices will fall, but not by as much as the example of the single security, and the increase in relative returns will similarly be more muted.

[20] For an analysis of the costs of trading and post-trading, see Oxera (2011), 'Monitoring prices, costs and volumes of trading and post-trading services', report prepared for European Commission DG Internal Market and Services, May. Oxera (2009), 'Monitoring prices, costs and volumes of trading and post-trading services', report prepared for European Commission DG Internal Market and Services, July. Oxera (2007), 'Methodology for monitoring prices, costs and volumes of trading and post-trading services', report prepared for European Commission DG Internal Market and Services, July; Oxera (2012), 'What would be the costs and benefits of changing the competitive structure of the market for trading and post-trading services in Brazil?'. Prepared for the Securities and Exchange Commission of Brazil, June; For an international comparison of transactions costs see, Oxera (2006), 'The Cost of Capital: An International Comparison', prepared for the City of London Corporation and the London Stock Exchange, June. All of these reports are available on www.oxera.com

[21] If a long term investor, such as a pension fund, purchased a bond at issuance and held the bond until redemption, then no FTT would be paid, as no secondary market financial transaction would have occurred. However, such investors re unlikely to the marginal investor who sets the price at issuance. The marginal investor is likely to be someone who expects to trade the bond before redemption

[22] As noted in Oxera (2011), the impact of the FTT also equally affects the incentive to invest in a company using retained earnings. This is because the FTT reduces the increase in the value of the business that can be expected from investment, irrespective of the form of funding. In its impact assessment, the Commission assumed that retained earnings would not be affected. See Oxera (2011), 'What would be the economic impact of the proposed financial transaction tax on the EU?', prepared for the Association for Financial Markets in Europe, the Italian Association of Financial Intermediaries and the Nordic Securities Association, December.

In the context of an FTT introduced for 11 countries who are closely integrated into the world economy, this means that many (although not necessarily all) investors will have alternative investments where the FTT does not impact. As a result it is likely to be the firms (or governments) issuing equities or bonds that will have to pay the tax, in the form of higher gross returns so that investors receive approximately the same net return. The higher gross return required by firms and governments feeds through into lower level of investment and higher costs for government finances.

The precise balance between higher costs for issuers or lower net returns for investors will depend on both the precise detailed design of tax and the actual level of economic integration between the FTT-zone and non-FTT-zone investors and intermediaries. However, critically, where the supply of financial intermediation services is competitive the FTT is not paid for by the intermediaries – it is either the end-user investor or the end-user issuer.

Section 3.2 returns to this issue with specific reference to the potential impact of the FTT, similarly finding that some of the burden is shared by investors as well as the companies issuing the shares.

2.3 Will the financial services sector absorb some of the transaction costs?

The FTT would create additional transaction costs not just for end-user transactions in a financial instrument, but for all traders, including financial intermediaries such as market makers (see Box 2.1). Financial intermediaries trade with end-users and other financial intermediaries with the intention of making a profit (simplistically, buying at a lower price than they sell, or by charging commissions).[23] However, by doing so, they 'create the market' for end-users, so that debt and equity securities can be bought easily and sold quickly without affecting the market (which is described as 'liquidity'). As noted above, the reward for these activities is ultimately paid by the end-users (companies and investors).

So, with regard to an increase in transaction costs due to an FTT, this leads to the following questions:

– would the financial services firms absorb some of the cost of the FTT through a reduction in their profit margin?

– what happens to the cost of the FTT for transactions involving financial institutions only?

– what might be the cost for other activities, such as hedging? (For more detail, see section 2.4.)

Box 2.1 Value of market-making activities

In Oxera (2013), the value of market makers and damage to market makers from the FTT was a key concern:

> Existing FTT's typically provide exemptions for market makers and other financial intermediaries, to varying degrees, including the new FTTs in France and Italy. Exemptions are provided, as intermediaries are seen to play an important role in assisting the efficient functioning of markets by providing liquidity.
>
> Financial intermediaries that are continually willing to buy or sell securities in a market are known as 'market makers' (typically large banks). They will buy securities from investors and then sell those securities to another investor. The difference between the purchase price and the sale price is known as the bid/ask spread, and this is how the

[23] The bid/offer spread compensates the market maker for the capital costs of holding a position for some length of time and for taking the risk that the price moves against them before they can unwind that position, as well for the operational costs involved in participating in the market.

market maker earns a return for providing liquidity to the market. In liquid markets, bid/ask spreads are typically very small, at just a few basis points, but can be significantly larger than this in less liquid markets.

Market makers improve the functioning of financial markets (as shown by academic evidence described below) by continually offering prices to buy and sell securities, so that end-users can buy and sell whenever they wish (albeit at a cost determined by the bid/ask spread). These intermediaries provide economic value to end-users through this 'immediacy' (being able to trade whenever they wish) and by helping to improve price information (as they are always offering prices to buy and sell).

[...] There have been a number of empirical studies which aim to estimate what value market makers provide. [...] This academic literature is consistent in the finding that market makers tend to increase liquidity, through the lowering of spreads and rise in volumes.

Summary of key papers in Oxera's literature review:

Nimalendran and Petrella (2003): 'thinly traded' stocks benefited from a market-making programme, with spreads reducing, and increases in liquidity and depth measures.

Mayhew (2002): cross-listed options traded under market makers have smaller bid/ask spreads than under open outcry.

Eldor et al. (2005): post-market-maker introduction, markets saw an increase in liquidity of 60% and a bid/ask spread reduction of 35%, as well as other liquidity-related improvements. The authors found that each $1 spent that the operator spent on sponsoring market makers resulted in $67 of public benefit to the market participants.

Tse and Zabotina (2004): the introduction of a designated market maker into CBOT 10-year IRS futures improved liquidity, reducing transaction costs and raising volumes, while improving price discovery.

Comerton-Forde et al. (2010): 'stronger' market makers who are less constrained by financing are better able to increase liquidity and reduce market transaction costs

Sources: Nimalendran, M. and Petrella, G. (2003), 'Do thinly traded stocks benefit from specialist interventions?', *Journal of Banking and Finance*, **27**, pp. 1823–54. Mayhew, S. (2002), 'Competition, market structure, and bid–ask spreads in stock options markets', *Journal of Finance*, **57**, pp. 931–58. Eldor, R., Hauser, S., Pilo, B. and Surki, I. (2005), 'The contribution of market makers to liquidity and efficiency of options trading in electronic markets', *Journal of Banking and Finance*, **30**, pp. 2025–40. Tse, T. and Zabotina, T. (2004), 'Do designated market makers improve liquidity in open-outcry futures markets?', *Journal of Futures Markets*, **24**:5, pp. 479–502. Comerton-Forde, C., Hendershott, T., Jones, C.M., Moulton, P. and Seasholes, M.S. (2010), 'Time Variation in Liquidity: The Role of Market-Maker Inventories and Revenues', *The Journal of Finance*, **LXV**:1, pp. 295–331.

2.3.1 Would the financial services firms absorb some of the cost of the FTT?

Financial services firms can sometimes, but by no means always, make substantial profits from transactions on financial markets. This potential for considerable profits to be made raises the question as to whether financial services firms may simply absorb the cost of the FTT by reducing their profit margins? This question is at the heart of the Commission's claim that the FTT will be a tax on the financial services sector rather than on the users of those financial services in the rest of the economy. The validity of the Commission's expectations for the tax are discussed in sections 3 and 4 (in particular), but this question also needs to be addressed in the conceptual framework for assessing what the impact of the tax is likely to be.

Academic empirical evidence shows that the financial services sector will not typically absorb the tax through lower profit margins, but will pass the tax on to end-users.[24] Reason why this will happen include:

[24] If the price of electricity rose across Europe financial intermediation firms would not be expected to absorb this general cost increase, and as the price of computing power has fallen, this cost reduction has been mirrored by a reduction in the price of

– the provision of many, if not most, of financial intermediation services occur in reasonably competitive markets, where prices approximate efficient costs. Cost shocks in these types of markets get reflected in changes in prices

– the cost of the FTT is significantly higher than current transaction prices for many financial securities, and therefore it would simply be impossible for financial institutions to fully absorb the cost; and

– market-making activities in particular provide financial institutions with competitive margins (defined by the bid/ask spread) that would be unlikely to absorb a tax of the scale of the proposed FTT.[25]

Transaction costs have typically fallen markedly over recent years, and now in many cases are less (and often much less) than the proposed FTT. For example, a recent report found that bid/offer spreads on shorter maturity interest rate swaps would need to widen between 2 and 30 times in order to accommodate the cost of the FTT.[26] Similar results were found for foreign exchange derivatives.[27] Transaction costs are also very low for bond transactions, and are similarly much less than the rate of the FTT.[28]

Furthermore, academic literature shows that financial institutions pass on the cost of taxation to their customers. For example:

– Huizinga, Voget and Wagner (2012) find that taxation on banks' international activities is almost fully passed on to higher interest rates and simultaneously reduces banking sector FDI (foreign direct investment);[29]

– Gambacorta (2004) [30] finds that interest rate pass-through is high, if not complete, among Italian banks:

> After a one per cent increase in the monetary policy indicator, interest rate on short term lending are immediately raised of around 0.5 per cent and of around 0.9 per cent after a quarter. Moreover, the pass-through is complete [100%] in the long run;

– De Bondt (2002) finds that interest rate pass-through in the Euro Area is close to 100% for bank lending rates in the long term, and that this conclusion is supported by a number of other models and by sub-samples of the Euro Area data;[31]

– Sørensen and Werner (2006) find lower pass-through rates using the official interest rate rather than market rates and find that corporate loans are the most responsive and

many financial intermediation services. A change in the tax cost of a transactions is economically no different to a general change in the costs of some other necessary input.

[25] It is important to distinguish between proprietary trading activities and market-making activities. Traders may continue with their proprietary trading activities but could decide to discontinue offering market-making activities.

[26] See ICAP, 'Financial Transactions Tax, an ICAP discussion document', April 2013. Available at www.icap.com/ftt/discussiondocument.html

[27] See Oliver Wyman, 'Proposed EU Commission financial transaction tax impact analysis on foreign exchange markets', January 2012.

[28] Bid-ask spreads for European government debt are around one basis point during non-crisis times. For analysis, see Calice, Chen and Williams (2011), 'Liquidity spillovers in sovereign bond and CDS markets', July 2011.

[29] Huizinga, H., Voget, J. and Wagner, W. (2012), 'International Taxation and Cross-border Banking', Oxford University Centre for Business Taxation, Working Paper 12/25, October.

[30] Gambacorta, L. (2004), 'How do banks set interest rates?', National Bureau of Economic Research Working Paper Series, 10295.

[31] De Bondt, G. (2002), 'Retail Bank Interest Rate Pass-through: New Evidence at the Euro Area Level', European Central Bank Working Paper Series no. 136.

current accounts the least—supporting a distribution of rate impacts towards the borrower.[32]

These empirical results are consistent with the expectation that the market for liquidity provision services and other financial intermediation services are competitive. Economic theory shows that in a competitive market, a cost applied to all suppliers (such as a tax) is passed on to customers in full.

2.3.2 To what extent are the activities of financial institutions caught by the FTT?

Since the idea of the FTT was first put forward by the Commission in 2011, its scope and, in particular, the precise definitions of what transactions and/or institutions would be subject to the tax, has changed significantly. At present, although the general scope of the transactions that would be subject to the tax is described in the latest draft of the Directive, and further detail on what the Commission expect to be taxed can be gleaned from the Commission's impact analysis, there is still (as at the end of June 2013) a significant degree of uncertainty as to precisely which transactions would be taxed.

A critical example is the status of the transactions that occur when a security transaction occurs on an exchange and is centrally cleared and settled in a CCP (central counterparty) and CSD (central security depository). Many commentators have concluded that in this case there are up to six transactions that could be taxed, with ten sides of those transactions actually taxed, in order to complete the transfer of the security from one end investor to another (see the example in figure 2.1 below). However, another interpretation of the draft Directive would conclude that in a normal transaction across an exchange where the broker is acting as an agent for an end investor, there is only one taxable transaction, with both sides of the transaction liable. This latter interpretation relies on the exclusion in Article 10(2) that 'Where a financial institution acts in the name or for the account of another financial institution only that other financial institution shall be liable to pay FTT', as discussed below.

As these two interpretations result in a different tax burden in the ratio of 5:1 (1%:0.2%) the impact of the FTT is likely to be very different depending on which interpretation is correct.

This creates considerable uncertainty in terms of the economic impact of the FTT, and to some extent explains wide variation in estimates of the impact. This study recognises this important distinction between an FTT that falls on all the constituent parts of a single transaction and an FTT that treats this linked chain of activities as being only one transaction. As the precise application of the tax has not yet been determined, either outcome is possible in theory, and therefore this report considers both.

This report does, however, focus the quantitative economic impact analysis on the scenario in which the tax is designed to avoid producing multiple taxation events within one transaction. The reasons for this focus (which are discussed in further detail in section 2.3.3 below) are as follows:

– the latest Commission proposed Directive does make clear that the intention is for the FTT to avoid repeatedly taxing the same transaction as it moves through to completion (for example, the transactions that automatically occur as a CCP steps into a transaction which is undertaken between two market participants across an exchange)

– further clarification of the Commission's intention can be found in Example 2 (page 19) of the Staff Working document; here, a subsidiary of a US bank enters into a derivatives

[32] Sørensen, C.K. and Werner, T. (2006), 'Bank Interest Rate Pass-through in the Euro Area: A Cross Country Comparison', European Central Bank Working Paper Series no. 580.

contract for a German bank customer, but only the German bank pays the FTT as the US subsidiary is acting for the German bank;[33]

– the recently introduced financial transaction taxes in France and Italy avoid multiple taxation events; this is also consistent with the European Parliament debate on the FTT which explored whether market-making activities should be exempt; and

– the recent (September 2013) discussion by the EU Council legal service[34] (which suggested that the proposed FTT exceeds national jurisdiction, 'infringes' on EU treaties and 'is discriminatory' to non-participating states) suggests that any future FTT proposals may need to be scaled back; constructing a tax more akin to existing forms of financial transaction taxation (in France and Italy), and hence avoiding cascading transactions, would seem a likely avenue given these concerns.

However, there is still a significant degree of uncertainty over the precise scope of any FTT and the underlying policy objectives that drive this. For example, although the direct additional transactions required to put a CCP into the middle of a transaction once it is agreed do not seem to be part of the tax base, the subsequent necessary transactions required to maintain the appropriate degree of margining at the CCP do appear to be part of the tax base.

2.3.3 Which transactions would be taxed?

In the debate about the FTT, there has been much discussion about cascading transactions. There are many inter-related transactions occurring between financial institutions, as different financial institutions conduct transactions on behalf of customers and also hedge their positions following transactions with customers. This leads to complexity in terms of what is involved in cascading transactions, but ultimately the cost of these transactions (including any tax payable) can be expected to fall on to end-users. This section explains how cascading transactions occur and the impact of the FTT.

As discussed, the European Commission have stated that the issue of cascading transactions can be addressed by providing an exemption from the tax for financial institutions that 'acts in the name or for the account of another financial institution',[35] but this only addresses part of the reason why cascading transactions occur. Oxera identifies four forms of cascading transactions:

– transactions by the providers of trading and post-trading services (including brokers, clearing members, CCPs and CSDs) in order to facilitate a single trade between two end-users (or others who end up actually owning the security);

– transactions by market-makers and other financial intermediaries that provide liquidity so that end-users can trade quickly and/or with little impact on the market;

– transactions conducted by financial institutions in order to hedge risk created by other transactions with end-users; and

– transactions conducted to provide collateral for other financial transactions.

Transactions by the providers of trading and post-trading services could be seen to require many additional financial transactions in order to allow an exchange-based trade between two end-users. Clifford Chance produced a much-quoted illustration of this,

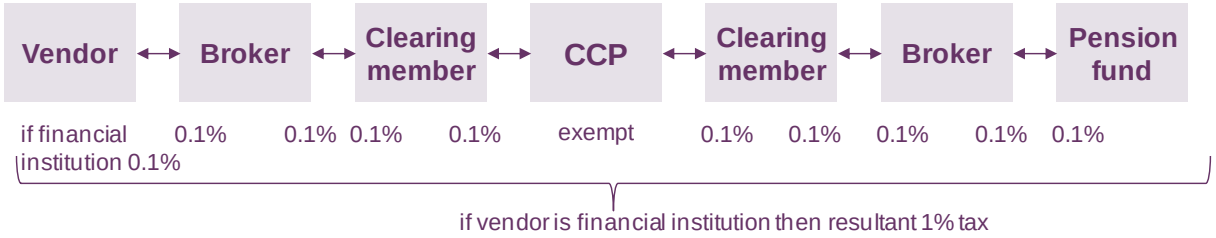
[33] Available from http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=SWD:2013:0028:FIN:EN:PDF

[34] As reported (including the original document) by the Financial Times on September 10th 2013. See http://www.ft.com/cms/s/0/b0a6c7a8-19fd-11e3-93e8-00144feab7de.html?siteedition=uk&siteedition=uk#axzz2f9mNEqVZ

[35] See paragraph 3.3.4 of the European Commission 'Proposal for a Council Directive' Com(2013) 71 final, February 14th 2013.

reproduced in Figure 2.1. The idea is that the workings of the financial system mean that there are many additional transactions involved in each transaction between end-users.

Figure 2.1 Illustration of cascading transactions



Source: Clifford Chance.

Ultimately, the trade involves a security being traded between two end-users; in reality, there are often additional transactions involved. The illustration in Figure 2.1 shows an end-user (the vendor) instructing the broker to sell the security, who then transacts with a clearing member (once the order is matched on an exchange). Meanwhile, the pension fund has instructed its broker to buy securities, who then also uses a clearing member once the trade is matched. The exchange having matched the two orders hands over the trade to the relevant central counter party (CCP), who interacts with the two clearing members. Although the CCP is exempted from the tax, counterparties to the CCP are not automatically exempt. This chain of orders is shown in the Clifford Chance diagram, reproduced in Figure 2.1 above. However, there are also instructions to the central securities depository (CSD) from the CCP and from parties with accounts in the CSD which move securities between accounts. There could easily be four or more movements in order for the security to be moved from the vendor to pension fund in the diagram above,[36] which could be added to this diagram. If all of the transactions in figure 2.1 were subject to the FTT, then this example results in ten incidences of the tax, 1% in total.

On the basis that the evidence suggests that tax costs are passed on to end-users, this might suggest that the end-users will bear all ten incidences of the tax in this illustration. This would hit the end-user in terms of either increases in explicit charges (eg, the commission rate between the vendor and the broker, charges between the broker and the clearing member) or a broader bid/ask spread—ie, the difference between the prices at which they are able to buy and sell the share would become greater, as the intermediaries seek to cover the cost of the tax from the spread.

However, this is the type of cascading transaction that the European Commission has indicated should be exempt from the FTT. In its most recent documents, the European Commission has explicitly clarified that CCPs and CSDs (as institutions and acting in their CCP or CSD capacity) would be exempt, and in addition, the brokers and clearing members interacting with the CCPs and CSDs could be considered to be acting 'in the name or for the account of another financial institution' and therefore the transaction activity between them would also be exempt. Section 3.3.4 of the preamble of the latest Council Directive sets this out, although it is still not completely clear where the precise boundary of the tax lies.[37]

[36] A typical multi-stage movement would be: vendor's custody bank's account to vendor's broker's account (1) to broker's clearing member's account (2) to the pension fund's broker's clearing member's account (probably in a netted transaction) (3) to the pension fund's broker's account (4) to the pension fund's custody bank's account (5).

[37] At this stage, no clear definition is provided for what constitutes 'acting in the name of or for the account of another financial institution'. The intention to avoid cascading transactions is made clear, however. The approach may not involve the distinction between agent and principle, for example if this distinction does not result in a tax design that would effectively avoid cascading transactions.

In addition, the Commissions impact analysis (which is only undertaken with respect to equity transactions) is consistent with the necessary CCP and CSD transactions being outside the scope of the tax base.[38]

This would suggest that, although clearing members trade with CCPs as principal, they are still trading 'in the name or for the account of another financial institution' and therefore should be exempt. Similarly the brokers can be deemed to be trading 'in the name or for the account of' the end users. Given this interpretation of the Commission's proposal, this would suggest that only the vendor and pension fund would be taxed in the example above (and hence there would be no additional taxable cascading transactions in transferring ownership of the security from the vendor to the pension fund). This approach may require additional reporting for the broker and clearing member to indicate that, for the purposes of the FTT, they are acting on behalf of another financial institution, which may incur additional costs. Alternatively, the debate of the European Parliament suggests that financial intermediaries may instead simply be exempt.

The approach of this study is to assume that the Commission is able to achieve its aim of avoiding these types of cascading transactions being included in tax base, but does continue to tax market making activities, as they set out in their latest documentation. This approach has recently been further supported by the discussion of the EU Council legal service[39] that the proposed FTT exceeds national jurisdiction, 'infringes' on EU treaties and 'is discriminatory' to non-participating states. Commentators (included in the FT article) have suggested that this legal discussion points towards any FTT being designed to be more like existing national FTTs, which in turn suggests that multiple cascading taxation events will be avoided.

Transactions by market-makers and other providers of liquidity would, however, be subject to the tax. Market makers are continuously willing to buy and sell securities, which means that investors can always buy or sell whenever they want to. The first end-user would sell the security to the market maker, who is continuously available to buy, and then, at a later point in time, the market maker would sell either to another financial intermediary or to another end-user, in order to maintain their desired portfolio. Both of these transactions would be subject to the FTT, yet all of the cost of the FTT would need to be borne by the end-users in order for the market makers to continue to provide this service to the market. Unless market makers can recover the cost of taxation from their effective spread they will stop making markets.

If there is a reduction in these transactions, due to the increased cost of the FTT, there may be a reduction in market liquidity, which can create additional costs for investors. These costs include a loss of immediacy (an increase in the amount of time that it takes to make a transaction, which increases risk of the price changing) and potential greater market impact (meaning that the transactions by the end-user adversely affects the market price to them to a greater extent).

In addition, **financial institutions conduct additional transactions in order to hedge their positions** created by other transactions with end-users, and these cascading transactions would be taxable. For example, the first (taxable) transaction may be a corporate buying an

[38] The Commissions impact statement was based on an equity transaction tax base of 2.3 trillion euro. If the tax base was to include the flow-on transactions between the brokers and the CCP, CSD etc as set out by Clifford Chance, the number of taxable transactions would be very much higher (x5), or the number of end user transactions across trading venues would have to be very much lower (20%). If either of these held, the Commission's impact analysis would be very different. As a result, for the purposes of this analysis Oxera have assumed that the direct transactions involving CCPs and CSD that are necessary for the successful origination and completion of a transaction across a trading venue, or OTC, will not be part of the tax base.

[39] As reported (including the original document obtained) by the Financial Times on September 10th 2013. See http://www.ft.com/cms/s/0/b0a6c7a8-19fd-11e3-93e8-00144feab7de.html?siteedition=uk&siteedition=uk#axzz2f9mNEqVZ

financial instrument from a bank (such as an interest rate swap). In order to manage its risk, the bank would then conduct another (taxable) transaction with a different party passing on a proportion of the risk. Further transactions may also be triggered by complex derivative positions being created through subsequent transactions in a number of more standard 'plain vanilla' derivatives.

Additional taxable transactions can also be created through **the posting of collateral with CCPs for the original financial transaction** (or the posting of collateral in the case of bilaterally cleared OTC transactions). For example, if the end-user has financial securities available (rather than cash) to meet margin requirements, then a process of collateral transformation may be required. This would involve a repo transaction to convert the security into cash, and the repo transaction would be taxable under the FTT.

Based on these considerations, for the purpose of this analysis of the economic impact of the FTT, Oxera assumes that the proposed FTT would exempt from the tax base transactions that relate to the movement of securities in a CSD directed connected to a transaction across an exchange or trading venue and the direct transactions related to the imposition of a CCP between market participants once a transaction between then has been agreed. Applying this to figure 2.1 above means that this sequence results in only one (and not up to 5) taxable transactions.

If this assumption is incorrect, then there are two serious implications:

– Firstly, the Commissions own impact statement is based on a materially wrong tax base and therefore even within its own limitations will be giving a very misleading picture of the effect of the FTT.

– Secondly, and more importantly, the additional costs imposed on end-user transactions as a result of the FTT increases by up to a factor of five. It would be expected, therefore, that the impact on the real economy would be much more severe than is set out in the analysis below. This means that FTT-zone GDP would be reduced more, and the negative impact on other tax revenues would be higher. The reduction in transaction levels would be higher, so the negative impact on market liquidity would be higher, resulting in even higher costs to issuers. The analysis set out below concludes that the FTT will result in a small net loss of public revenues and a reduction in economic activity and investment. There is no economic rational that suggests that increasing the scope of the tax base will do anything other than make the economic impact worse.

However, notwithstanding the exclusion of direct CCP and CSD transactions from the tax base there would still be additional taxable cascading transactions flowing from an end-user transaction due to the inclusion of market-makers, the hedging activities of financial institutions and the posting of collateral within the tax base.

How many cascading transactions would be likely to occur with the FTT? This depends on the value that the cascading transactions provide, such as through improved liquidity. If that value to users is currently greater than the cost of the FTT, those transactions are likely to continue; if the value is less, the transactions are not likely to continue, in which case there would be a negative economic impact from losing the value they do bring (and also no FTT tax revenue, as there is no transaction).

Ultimately, this would be an empirical question, and the likely extent of cascading transactions is discussed in sections 3.2, 3.3, 4 and 5 below for bonds, equities, derivatives and repos respectively.

2.4 What other costs are there for the financial system?

The financial system also involves many financial transactions that are conducted by both financial and non-financial institutions in order to provide products to retail and business

customers in an efficient manner. These additional transactions, which predominantly involve financial derivatives, can arise due to:

– financial institutions hedging positions to assist in the provision of financial products; for example, an retail investment fund manager providing a product with a minimum return guarantee will typically need to conduct financial transactions in derivatives in order to hedge the risk of actual returns being below the minimum return guarantee provided; this hedging would often be seen to be vital in the view of the regulator in order to ensure that the customer receives the guarantee being made;

– non-financial institutions hedging financial positions in order to manage their own financial risk; for example, a farmer may conduct financial transactions to ensure that they receive a minimum guaranteed price for their crop.

According to the Commission's estimates of expected FTT revenue, taxing financial derivatives is expected to account for approximately two-thirds of total FTT revenue. This aspect of the impact of the FTT on the financial services sector is therefore potentially one of the most important aspects of the tax. This impact was not, however, a focus of the Commission's impact assessment, despite its importance.

2.4.1 Financial institutions hedging positions

Financial institutions conduct financial transactions for the purposes of providing financial products to retail consumers and businesses. In order to provide the various functions of financial intermediation, banks and other financial services firms need to hedge their positions and manage their risk. For example:

– banks providing standard services of deposit taking and lending to retail and business customers typically manage their risk through taking positions in derivatives, particularly interest rate swaps;

– insurance companies hold positions in financial derivatives to manage the risk to which they are exposed—for example, a life insurance company holding assets for future pension payments may hedge the risk of those assets underperforming, through derivative positions;

– banks also provide risk limited products to customers, such as fixed-rate mortgages or investment funds with minimum return guarantees; these products typically involve the bank hedging risk using derivatives.

The proposed FTT would directly tax each transactions in financial derivatives at 0.02% of their notional value (including the tax on both sides of the transaction), although, as explained above, the burden of the tax could be higher than this due to cascading transactions and the need to post collateral. This means that each transaction is taxed at a flat rate that takes no account of the duration of the derivative (which can vary from days to years) and the contract price of the derivative. As explored in section 4, this means that different uses of derivatives are taxed more heavily than other uses.

In this context, the FTT represents an additional cost of production for the suppliers of financial services products with the tax representing very different proportions of the costs of the other inputs required for different hedging products. These costs are assessed in section 4 of this report. As these costs of production will apply to all suppliers of the products, the costs can be expected to be largely passed on to end-users: retail customers and businesses.

2.4.2 Non-financial institutions hedging positions

Non-financial institutions also use derivatives to hedge financial positions. For example:

– an exporter of wheat may hedge currency risk using a currency futures contract so that, if the exchange rate changes unexpectedly, the exporter is not adversely affected;

– a producer of wheat may also hedge against commodity price volatility by taking a position in wheat futures contracts so that, if the price of wheat changes, the producer is unaffected;

– an airline may hedge against input price uncertainty, by taking a position in derivatives to hedge against fuel price risk.

These financial transactions are conducted to manage the risk of these businesses. Typically, these transactions would be conducted with a financial institution, which results in a direct tax rate of 0.01% of the notional value if the non-financial institution is not directly taxed (as suggested in the proposals). However, the definition of 'financial institution' is thought to be very broad, and may actually include many of the larger non-financial corporates that conduct financial transactions, which would mean that the direct tax rate would be 0.02%. In addition, the burden of the tax could be greater than this, due to cascading transactions and the need to post collateral (as explained above).

Again, the FTT represents additional costs of production for these non-financial corporations. These costs are assessed in section 4 of this report. Costs that apply to all firms across the sector can be expected to be largely passed on to consumers. The impact in this analysis is assessed through the macroeconomic modelling, as discussed in section 9.

2.5 What is the basis for assessing the macroeconomic impact?

The primary focus of this report is the potential impact of the FTT on the wider economy. The FTT will have an impact on the wider economy for the various reasons discussed in this report, including:

– increases in the cost of funding investment, as both the cost of equity and the cost of debt increase;

– increases in the cost of bank lending for both retail and business customers, due to increased costs of banking, due in turn to the taxation of derivatives trading and repos;

– increases in the costs of production for businesses across the economy, due to increased cost of hedging activities; and

– loss of net exports in some markets due to relocation of financial trading activities.

Due to the complexity of the relationships between different macroeconomic indicators in different EU Member States, the overall impact on the macroeconomy is estimated using Oxford Economics' Global Economic Model.

This analysis is discussed in section 9 of this report.

3 Funding investment

As discussed in section 2, the FTT creates a wedge between how much the borrower (eg, a corporation or a government) has to pay in return for financing, and what the investor expects to receive (post-tax). There is already a divide between what is paid by the borrower and what is received by the lender due to other taxes and costs, such as corporation tax and the cost of issuing tradable securities. The FTT widens this divide.

The tax therefore either increases the cost of funding for companies and governments, or reduces the returns to investors, or a bit of both. This impact is perhaps one of the more tangible effects of the FTT, and has therefore been the primary focus of most economic impact assessments, including by the Commission. Increasing the cost of funding leads to reductions in investment and therefore long-run reductions in GDP. While this is not the only route through which the FTT affects the wider economy, it is one of the most important, and therefore forms a core part of Oxera's assessment of the economic impact.

In this section, Oxera reviews existing estimates of the impact of the FTT on the cost of funding, describes the approaches adopted by Oxera, and estimates the potential impacts. The key inputs from this analysis for the macroeconomic model are changes to the cost of debt and the cost of equity.

Section 3: Key findings

- Oxera estimates that the yields of sovereign debt trading in secondary markets are likely to rise by approximately 0.2 percentage points on average. This is expected to be accompanied by a marked decline in sovereign debt trading, particularly in the more liquid markets.
- The impact on the cost of debt for sovereign bonds can be expected to have implications for corporate bonds as well. On this basis, a 0.2 percentage point increase in the cost of corporate debt is also assumed.
- Oxera estimates that a transaction of an equity security between end-users is likely to result in four transactions in total, due to transactions between financial intermediaries. This suggests that the impact of the FTT on the cost of equity (the annual required return) in the FTT-zone will be an increase of 0.4 percentage points.
- These estimate lie in the middle of the range of estimates based on other sources (0.3–0.5 percentage points, as explained below) and corresponds to the estimates in the Commission's own research.
- Oxera also considers the potential impact of the FTT on the cost of equity and the cost of debt in the UK (ie, outside the FTT-zone). The evidence suggests that the tax could lead to increases in both the cost of equity and the cost of debt, but these increases are likely to be much smaller than within the FTT-zone. This is because most trading in these securities takes place outside the FTT-zone and therefore will not be subject to the tax. As a result financial intermediaries in the FTT zone would be uncompetitive as counterparties in this market so their current activities will be replaced by intermediaries who are not resident in the FTT zone.

3.1 Existing estimates of the impact

There have been some estimates to date of the potential impact of the FTT on the cost of capital in the debate.

The Commission's impact assessments have been based on the results of two pieces of research into the potential impact of the FTT on the cost of capital (and consequently economic output), published in September 2011[40] and May 2012[41] respectively. Both studies found a significant impact on the cost of capital:

– the first study estimated that the cost of capital would increase by 0.4 percentage points, with share prices falling by 8.67%;[42]

– the second study did not produce a direct estimate, but did find that share prices would fall by 8.4%,[43] which is similar to the finding of the first study, and therefore also suggests a 0.4 percentage point increase in the cost of capital.

A working paper by the International Monetary Fund (IMF) estimates that, based on the S&P 500 index, an FTT of 10 basis points (bp) would reduce the value of shares by 7.6% and 'increase their cost of capital by about 25 basis points'.[44] This analysis assumed that the tax is applied only once per transaction, in line with current European FTT's in France and Italy.

In January 2012 the CPB estimated that the FTT would raise the cost of capital by around 0.15–0.3 percentage points based on the number of taxable cascading transactions varying between 2 and 4.[45]

These analyses did not, however, directly assess the likely number of additional related transactions between financial institutions, which has been an important part of the debate about the FTT. Analyses to date of the potential cost given 'cascading' transactions have tended to be based on illustrations of impacts that do not take account of the potential impact of the tax on trading.[46] In some cases, for instance with bond trading, there could be significant reductions in the amount of transactions due to the tax.

The analysis that follows therefore contributes to the FTT debate by providing a more systematic appraisal of cascading transactions in these markets and how they might change following the introduction of the FTT. The analysis not only considers the burden of the tax on the remaining transactions, but also the potential economic implications of the reduction in the amount of transactions due to the tax, which can result in a sub-optimal amount of transactions and resultant distribution of ownership of securities, as the market has moved away from its (more) optimal position.

3.2 Impact on the cost of debt

Tradable debt instruments, including sovereign (government) and corporate bonds, come in many different forms, particularly with regard to their maturity date. Transactions of all of these bonds would be subject to the FTT when traded in secondary markets, although initial

[40] European Commission (2011), impact assessment.

[41] ECOFIN (2012), 'Securities Transaction Taxes: Macroeconomic Implications in a General-Equilibrium Model', paper 450 March.

[42] See European Commission (2011), op. cit., Table 1, p. 38.

[43] See ECOFIN (2012), op. cit., p. 22.

[44] Matheson, T. (2011), 'Taxing Financial Transactions: Issues and Evidence', IMF Working Paper 11/54, p. 14.

[45] CPB Netherlands Bureau for Economic Policy Analysis (2012), 'Financial transaction tax: review and assessment', January 16th, table 3.4, p. 14.

[46] See, for example, London Economics (2013), op. cit.

purchase at issuance (the primary market) and redemption are expected to be exempt from the tax.[47]

As discussed in section 2.2, investors' expectations of the impact of the tax on the entire chain of buyers and sellers over the life of the bond due to the FTT must be reflected in the issuance price, which in turn means that the issuer (eg, the government or company) will have to offer a higher coupon (and hence a higher yield) in order to raise the required amount of finance.

Among the FTT-zone countries, the outstanding amount of sovereign debt is around six or seven times higher than corporate debt. Sovereign debt markets are typically seen to determine long term interest rates, rather than corporate debt markets. For these reasons, sovereign debt and corporate debt are considered separately.

3.2.1 Impact on the cost of sovereign debt

Governments issue bonds with promised interest payments (the 'coupon') that are sufficient to attract enough demand from investors to raise the required amount for financing purposes. If those investors expect to pay the FTT in the future (when they sell the bond), they are likely to demand higher coupons; but how much higher?

Trading volumes for different FTT-zone government debt vary considerably. On the one hand, German bonds turned over almost five times on average during 2012, as secondary market trading volume was €5.4 trillion with €1.1 trillion of bonds in circulation.[48] Turnover ratios in other countries tend to be lower, however, with the government security ratio in Spain in 2012 being under two.[49] These estimates may suggest an assumption that the FTT-zone wide turnover ratio is around three.

The European Commission's own FTT revenue estimate for taxing sovereign debt in the FTT-11, of €6.5 billion, suggests trading of €4.6 trillion per annum.[50] This is lower than estimates of eurozone government debt trading of around €8-10 trillion per annum.[51] These estimates suggest a turnover ratio (the number of times bonds are traded per annum on average) of around two.[52] As these estimates may under-state trading due to uncertainties surrounding the amount of OTC trading, Oxera makes the assumption that the turnover ratio is three.

This analysis assumes that the number of taxable transactions is consistent with these estimates of the volume of trading. The estimates are for transactions between financial institutions, and therefore do include transactions involving market makers, but do not include any consequent transactions involving the providers of trading and post-trading services (such as CCPs, CSDs etc) or transactions involving the provision of collateral.[53]

As described in section 2.3.2, this analysis assumes that the FTT would be designed so as not to tax financial institutions that 'act in the name or for the account of another financial institution', as the European Commission has stated. If this were not to be the case, then the

[47] This would suggest that if an investor purchased a bond at issuance and held until redemption, then no FTT would be applicable. This is particularly relevant for short-dated bonds, and for longer-term investors, such as pension funds.

[48] Data from the Bundesrepublik Deutschland Finanzagentur GmbH, available from: http://www.deutsche-finanzagentur.de/en/institutional/secondary-market/

[49] Data from Banco de Espana, available from: http://www.bde.es/webbde/en/estadis/infoest/bolest22.html

[50] See p.33 of European Commission (2013), Staff Working Document SWD(2013) 28 final. €6 trillion is equal to the €6.5 billion divided by the tax rate (0.2%) divided by the ne w proportion of trading (70% remaining).

[51] For example, see 'European Government Bond Markets: transparency, liquidity, efficiency', CEPR 2006.

[52] The FTT-zone governments had total outstanding debt of around €5 trillion, according to Eurostat data for 2006, which suggests that average turnover (trade volumes over gross outstanding debt) is roughly equal to two. This compares to 5.2 for UK Gilts in 2012/13, as reported by the Debt Management Office (DMO).

[53] The latter transactions should be included. However there is no data on the volume of these transactions. The impact of this omission will be to underestimate the impact of the tax on both the increase in costs per transaction and the impact on the reduction in volumes as a result of that increase in costs.

number of taxable transactions could be significantly higher. Transactions that may be involved in the posting of collateral in the form of securities is treated as a form of repo transaction, as explained in section 2.3.4.

If all of the current trading (as defined) in FTT-zone government debt was to continue and was taxed by the FTT, then the total burden of the tax would be approximately 0.6 percent of the value of the sovereign debt per annum, as each bond is traded three times per year on average and the tax rate is typically 0.2 percent (as virtually all trades are between two financial institutions). This would suggest that, in the long run, either bond yields will increase by 0.6 percentage points to compensate investors for the cost, or investors accept a lower (post-tax return).

Alternatively, given that the profit margins involved in trading government debt would typically be quite small (as price movements are typically small compared with those that arise for equity), one might expect the FTT to result in a marked decline in trading activity. The Commission's original proposals implied that trading in bonds would decline by 31% due to the tax,[54] but the extent of trading between financial institutions suggests that this could be a significant underestimate of the impact on trading volumes. Oxera understands that a large proportion of trading in sovereign debt is conducted with 'on-the-run' bonds. Here the velocity of circulation is higher and transaction costs are particularly important. This suggests that the reduction in trading could be greater than the assumed 31%.

So what might be the trading levels with the FTT? Analysis of the market suggests that it could be much lower than at present. In the currently more liquid markets, most institutional investors could simply trade with one another when required without any need for market makers or other intermediaries, with transactions facilitated by electronic trading platforms. Given the small degree of volatility normally found in European sovereign debt (the recent period of volatility aside), the economics is unlikely to support much trading in debt at all, with a 0.2% transaction tax.

A reduction in trading volumes would mean that the direct burden of the FTT would be less. For example, if only a third of trading continued, then the total burden of the FTT would fall to 0.2 percentage points, based on the calculations above. However, this estimate would ignore the costs associated with reduced trading, due to the loss of market liquidity.

The price-discovery process would be hindered, and trading significant amounts on the market could affect the price. This suggests that the implicit cost of trading would increase.

Data on the implicit costs of trading sovereign debt is limited due to many trades being conducted over the counter (OTC).[55] European Central Bank research finds that liquidity affects bond yield spreads.[56] The findings of Bernoth et al. (2004) have been interpreted by Oxera as suggesting that the difference between the liquidity of the most traded bonds (those in Germany) and bonds of a small country (all else held the same) could account for a spread of around 15–20bp.[57] Given the relatively severe impact on bond trading assumed here, Oxera has adopted the top of this range: 20bp (which is 0.2 percentage points).

[54] See p. 18 of volume 12 of the European Commission (2011), op. cit., which combines a 10% fall in volumes due to 'relocation and evasion' with a 21% decline in volumes due to the increase in transaction costs deterring trading.

[55] Trades conducted directly between two financial institutions, not involving a trading exchange. OTC trades can be facilitated by electronic trading platforms, however.

[56] See, for example, European Economy (2009), 'Determinants of intra-euro area government bond spreads during the financial crisis', Economic Paper 338, November; or Bernoth, K., von Hagen, J. and Schuknecht, L. (2004), 'Sovereign risk premia in the European government bond market', ECB Working Paper Series Nov 369, June.

[57] Bernoth et al. (2004) find that a 1% point increase in the proportion of trading done in the relevant European market (the liquidity proxy) increases the spread by 0.7bp. So Germany's 25% share of the eurozone bond market reduces its spread by 17.5bp, which, including measurement error, suggests 15–20bp. This is broadly consistent with observations for countries such as Austria, which currently has a 35bp spread over Bunds, linked to liquidity risk and default risk (estimates based on current data from Bloomberg).

Using the estimate of transaction volumes being one third of current levels, which creates a 0.2 percentage point burden of the FTT, plus the impact on liquidity based on ECB research, which adds another 0.2 percentage point increase to the cost of debt, the overall **impact on the cost of sovereign debt is estimated to be 0.4 percentage points**.

There are also likely to be wider negative consequences from the decline in liquidity in sovereign debt markets and the consequent impeding of the price-discovery process. Financial institutions use government debt as a source of liquidity, and demand for this debt could be adversely affected by the loss of liquidity by more than is assumed here. Governments with budget surpluses have sought to maintain the liquidity of their debt markets, even when they have little need for funding.[58]

In addition, the impact on the price-discovery process could have implications for interest rate swaps and other derivatives. The economic cost of these impacts is highly uncertain, and this area would benefit from further research.

3.2.2 Impact on the cost of corporate debt

The corporate bond market in the FTT-zone is somewhat smaller than the sovereign debt market.[59] Levels of trading are typically lower for corporate debt than sovereign debt.[60] This could imply that the burden of the FTT would be greater for government bonds owing to the larger amount of trading (and therefore more incidences of the tax). Oxera does not come to this conclusion, however, as there are good reasons to expect that the impact on the cost of debt will be quite similar for government and corporate bonds.

There tends to be a great deal of trading in government bonds that have been recently issued (known as 'on the run'), reflecting the price-discovery process for the benchmark yields. This is the type of bond trading that is likely to be most affected by the FTT, as trades are being driven by expectations of changes in price (and therefore potential profits for traders) rather than decisions by end-users. The former 'speculative' trading is less likely to make economic sense with a 20bp tax applied.

The FTT can therefore be expected to result in a reduction in this price-discovery process and therefore a loss of market quality, which can be expected to lead to the increase in yields required by investors as estimated by the ECB for less liquid government bonds (see section 3.3.2).

This loss of market liquidity will also affect the corporate bond market, as corporate bond yields are determined as spreads on government bond yields, with the spread typically reflecting credit default risk.

Oxera assumes therefore that the impact on the cost of corporate debt is the same, with an **increase of 0.4 percentage points**.

3.2.3 Impact on the cost of debt in the UK

As with the cost of equity in the UK (see section 3.2.5), the impact on demand from FTT-zone investors for UK debt could affect the cost of debt in the UK even though the UK is assumed not to adopt the FTT.

[58] While not an issue at the current time in most European countries (except possibly Norway, which simultaneously sells government bonds and builds up a large sovereign wealth fund), budget surpluses affecting market liquidity was an issue in 1999–2000. For a discussion of the need to sell bonds to maintain liquidity even when financing is not required, see OECD (1999), 'Public debt—management at the cross-roads', Economic Outlook No 66, December.

[59] The ECB estimate that the total outstanding debt securities in the Eurozone area (which mostly comprises the countries in the FTT-zone) was some €14.6 trillion in July 2013, which suggests non-government ('corporate') debt of around €6.5 trillion. See http://www.ecb.europa.eu/stats/money/securities/debt/html/index.en.html

[60] The Commission noted this trend in its assessment of likely revenues in the original impact assessment. See European Commission (2011), op. cit.

Some commentators have suggested that the impact on UK sovereign debt could be significant, with a recent report finding that UK funding costs could rise by some £4 billion per year.[61] However, this analysis assumes that all the initial transaction and any further cascading transactions (ie. any further transactions between market makers) are taxed, which is unlikely as most trading of UK government debt is conducted in the UK by non-FTT-zone financial institutions and would therefore not be taxed, even before taking account of the likely behavioural changes. Therefore this trading can be (and mostly is) done by financial institutions not in the FTT zone, and therefore would not be covered by the FTT.

A more prudent assumption would be to assume that if an FTT-zone financial institution wishes to trade UK government debt, it will do so by trading with a non-FTT zone institution (probably in the UK) and that any subsequent cascading transactions between intermediaries are conducted between non-FTT zone institutions so that these additional cascading transactions are not taxed.

Oxera estimates that approximately 10% of UK gilts are held by FTT-zone investors, based on the following:

– the DMO has reported that, in recent quarters, the proportion of gilts owned by overseas investors has stabilised at around 30%.[62] As it does not report the split of non-UK investors by jurisdiction, it is not possible to observe directly the proportion of gilts that are owned by investors in EU countries;

– as a proxy for EU investment, Oxera has analysed the UK's balance of payments accounts to estimate the extent to which EU investors account for current-account credits.[63] Since 1997, the EU has accounted for 43–52% of these credits, with an average of 49%.[64] Therefore, it is assumed that around 50% of the non-UK owners of gilts are EU investors;

– but not all EU Member States are participating in the FTT.[65] As the 11 Member State participants account for about two-thirds of EU GDP,[66] it is assumed that two-thirds of EU gilt owners will be subject to the FTT;

– combining this information produces 30% x 50% x 67% = 10%.

Empirical evidence on the demand for bonds and the resultant yield suggests that an impact on the demand of 10% of investors could affect yields. For example, the Bank of England found that the quantitative easing programme 'reduced long maturity gilt yields by up to 95 basis points on the long run'.[67] Quantitative easing involved a significant increase in the demand for UK gilts and this reduced the yield, suggesting that a reduction in demand would increase the yield. The Bank of England analysis does not, however, provide firm elasticity estimates.

Instead, Oxera considers the tax burden on those FTT-zone investors. Without any cascading transactions being taxed (as they occur outside of the FTT-zone in order to avoid

[61] See London Economic s (2013), op. cit.

[62] Debt Management Office (2012), 'DMO Annual Review 2011–12', August, p. 10.

[63] Current-account transfers are assessed instead of capital-account inflows, as the latter do not appear to be broken down by EU and non-EU investors. For example, see Office for National Statistics (2012), 'Geographical breakdown of current account', Chapter 9 in 'United Kingdom Balance of Payments, The Pink Book'.

[64] Oxera analysis based on data from the UK Office of National Statistics.

[65] European Parliament (2012), 'Eleven EU countries get Parliament's all clear for a financial transaction tax', press release, December 12th. Accessed on May 10th at: http://www.europarl.europa.eu/news/en/pressroom/content/20121207IPR04408/html/Eleven-EU-countries-get-Parliament%27s-all-clear-for-a-financial-transaction-tax

[66] Ibid.

[67] Sarandi, A. (2011), 'The impact of Quantitative Easing on long maturity gilt yields', July, Bank of England.

the tax, as the UK is not in the FTT-zone), the analysis above suggests that the turnover of the 10% holding by FTT-zone investors would be relatively slow. Assuming the turnover of FTT-zone held UK government debt is one, the burden of the tax would be 0.2 percentage points, applied to 10% of the holding. This might suggest that **the total burden of the tax for UK gilts is 0.02 percentage points**. (This is much lower then the case for FTT-zone government securities, reflecting the fact that most transactions in UK gilts would not fall into the tax base.)

Given that most trading of UK government debt occurs outside the FTT-zone, there would seem little reason to envisage an additional significant impact on liquidity and therefore implicit costs of trading.

Overall, therefore, the potential impact on UK cost of debt would appear to be relative small.

3.3 Impact on the cost of equity

The burden of the FTT on the trading of equity ultimately falls on the end-users of equity: companies and investors. As described in section 2.3, the evidence shows that financial intermediaries pass the burden of taxation on to end-users and do not absorb the cost of the tax. The main impact on financial institutions is through the reduction in the volume of trading, not through the burden of the tax.

The FTT tax revenue from equity in a given year (which defines the burden of the tax) is equal to the volume of (taxable) transactions that occur multiplied by 0.2%, as the 0.1% tax is applied to both sides of the transaction. The main uncertainty for estimating the burden of the tax is therefore the volume of taxable transactions, which will be different from the volume that currently occurs. This is because some transactions that no longer make economic sense given the tax will no longer take place.[68] Although transactions that no longer take place do not incur a tax cost to end users, the reduction in trading activity itself may result in additional economic costs (for example, as a result of the reduction in liquidity), The impact of the recent imposition of a French FTT on equity trading has induced a reduction in trading levels (see below). Notwithstanding that there is widespread evidence of there being a liquidity premium on equity securities when comparisons are made between different securities, there is more limited empirical evidence as to the market wide effect of reducing trading volumes. Empirical data from the TABB group suggests that the market impact experienced by long term investors in European and UK equities has not changed significantly over the last few years, notwithstanding the significant drop in levels of trading in those securities.[69] This suggests that further empirical analysis is required to produce a robust estimate of the additional impact on the cost of equity from the impact on liquidity. An adjustment is made for this factor in this analysis (see below), but it is by necessity an estimate.

3.3.1 Estimates of the impact of the FTT on the cost of equity

As the UK already has in place a type of FTT—the stamp duty—with a rate of taxation comparable to the proposed FTT, the amount of trading by UK investors (unlike the intermediaries, end-users have to pay the stamp duty) should already reflect the impact of the tax. As there is significant trading in UK domiciled equities, the imposition of a FTT of the order of magnitude proposed is not going to result in no trading at all. Other European domiciled equities do not incur the stamp duty. For this reason, data on relative average holding periods for UK equities compared to other European equities could provide some evidence of the impact of an FTT (although other factors are also likely to influence average holding periods). Post the financial crisis holding periods in relation to the DAX index and the

[68] Some transactions may actually shift to be conducted by traders based outside the FTT-zone, so the overall global level of trading may not decline by as much as the FTT-zone level of trading.

[69] For a literature review, see Hibbert et al, 'Liquidity premium: literature review of theoretical and empirical evidence', September 2009. Available at: http://www.barrhibb.com/documents/downloads/Liquidity_Premium_Literature_Review.PDF

CAC index securities have been shorter than that for UK FTSE 100 equities.[70] If all of this difference was as a result of UK stamp duty, its impact would be a reduction in the amount of trading in the order of 60%.[71] However, most trading are concentrated in the high market capitalisation stocks, and if a comparison is made between the holding periods of the top 40 of the FTSE 100 the average holding period for these securities (X years) is closer to that of the CAC and DAX. This suggests that the UK stamp duty would reduce transactions by more like 25-30% if applied to the constituents of the CAC and DAX indexes.

In addition, the impact on the volume of trading in (large market capitalisation) French securities of the recent imposition of an FTT with a narrower scope than that proposed by the Commission has resulted in a reduction of volume of transactions of around 25%.[72]

The Commission itself expects that the FTT will result in a decline in trading activity among financial institutions, with the total volume of trading in equity decreasing by 30%. This is in line with the recent experience in France and likely to be broadly in line with the impact of the stamp duty on transactions in the UK.

In theory, if there were no additional cascading transactions nor any negative impact from the loss of transactions, the uplift to the cost of equity would be expected to be approximately *T / hp*, where *T* is the tax and *hp* is the holding period.[73] With an average holding period of around 1 year after the imposition of the FTT (currently around X years for the top 40 of the FTSE 100, and just under a year for the constituents of the CAC 40 and DAX 30 without an FTT) this suggests that a 20bp tax would lead to an increase in the cost of equity of around 20bp.[74] But this estimate would fail to take account of any additional (negative) impact on the cost of equity resulting from the reduction in liquidity (ie the economic value of the transactions that no longer take place). .

There is empirical evidence on the extent to which an increase in transaction costs leads to an increase in the cost of equity. For example, Domowitz & Steil (2001) use cross-country data to estimate the post-tax cost of equity elasticity to trading costs. They estimate an elasticity of 0.14–0.17 depending on the specification of the cost of equity estimate. In other words, a 10% increase in transaction costs would lead to a 1.4–1.7% increase in the post-tax cost of equity.[75]

The current level of transaction costs in UK equity markets is about 60–90bp.[76] A 20bp increase in transaction costs is therefore an approximate 20–30% increase in transaction costs. Other assumptions are that the elasticity of the cost of equity with respect to transaction costs is around 0.15, as estimated by Domowitz & Steil (2001), and the current

[70] It appears that the holding period for a broad equity market index is shorter in Germany than in the UK. This period for the DAX 30 in Germany has been around 0.7 years over the post-crisis period of 2009–11. By contrast, in 2009–11 the implied FTSE 100 holding period has been around 1.4 years. (Source: Oxera analysis based on Datastream.) This suggests that the estimate of intermediary transactions (*N)* may be lower using German market turnover data, but the holding period (*hp)* is also likely to be lower, resulting in an offsetting impact on the cost of equity.

[71] In 2012 the FTSE 100 index equities had an average holding time of 1.4 years, the CAC 40 0.8 years and the DAX 30 0.95 years: Oxera calculation

[72] The latest estimates suggest that the volume of transactions in France is now around 25% lower than what it would have been if the French FTT had not been introduced in August 2012. See http://www.thetradenews.com/news/Regions/Europe/French_equities_take_25__hit_from_FTT.aspx

[73] For more details, see Matheson, T. (2011), 'Taxing Financial Transactions: Issues and Evidence', March, IMF Working Papers, Section C and Appendix.

[74] In other words, the cost of equity uplift ~ T / hp = 20bp / 1 y, which is 20bp.

[75] Domowitz, I. and Steil, B. (2001), *Securities Trading', in Technological Innovation and Economic Performance*, Princeton University Press, Chapter 12.

[76] Elkins/McSherry and ITC Global Cost Review, as summarised in Polin, R. and Heintz, J. (2011), 'Transaction Costs, Trading Elasticities and the Revenue Potential of Financial Transaction Taxes', Political Economy Research Institute, University of Massachusetts Amherst, December, p. 5.

cost of equity is around 8%.[77] Under these assumptions, the 20bp tax would lead to a 27–40bp increase in the cost of equity.

The CPB Netherlands Bureau for Economic Policy Analysis produced another estimate of the impact of the FTT on the cost of capital of between 15 and 30 basis points.[78] This estimate includes the impact of the tax on the cost of debt, which the CPB report notes has a lower rate of turnover, suggesting that the impact just on the cost of equity would be greater.

These various estimates for the impact on the cost of equity suggest an increase between 20 basis points (assuming no additional negative economic impact or cascading transactions) and 40 basis points (based on empirical evidence of the impact on transactions costs). These estimates would therefore suggest a **cost of equity increase of 0.4 percentage points** in order to take account of the wider economic implications, as required for this study.

3.3.2 Distribution of the burden of the tax

An increase in the cost of transacting in secondary equity markets might in theory be distributed along the value chain, potentially including:

– the **originator**—the company that raises equity financing is likely to face upward pressure on the returns offered to investors to compensate for lower post-FTT returns;

– the **dealer(s)/intermediaries**—in theory, the intermediaries could absorb some of the cost of the FTT, although this is not supported by empirical research that finds a high degree of tax cost pass-on (see section 2.3). Intermediaries' ability to bear additional costs is likely to be constrained by the low margins that are currently available for transactions on liquid equity securities (see Figure 3.2) and low commission rates (<12bp), particularly for execution only brokerage;[79]

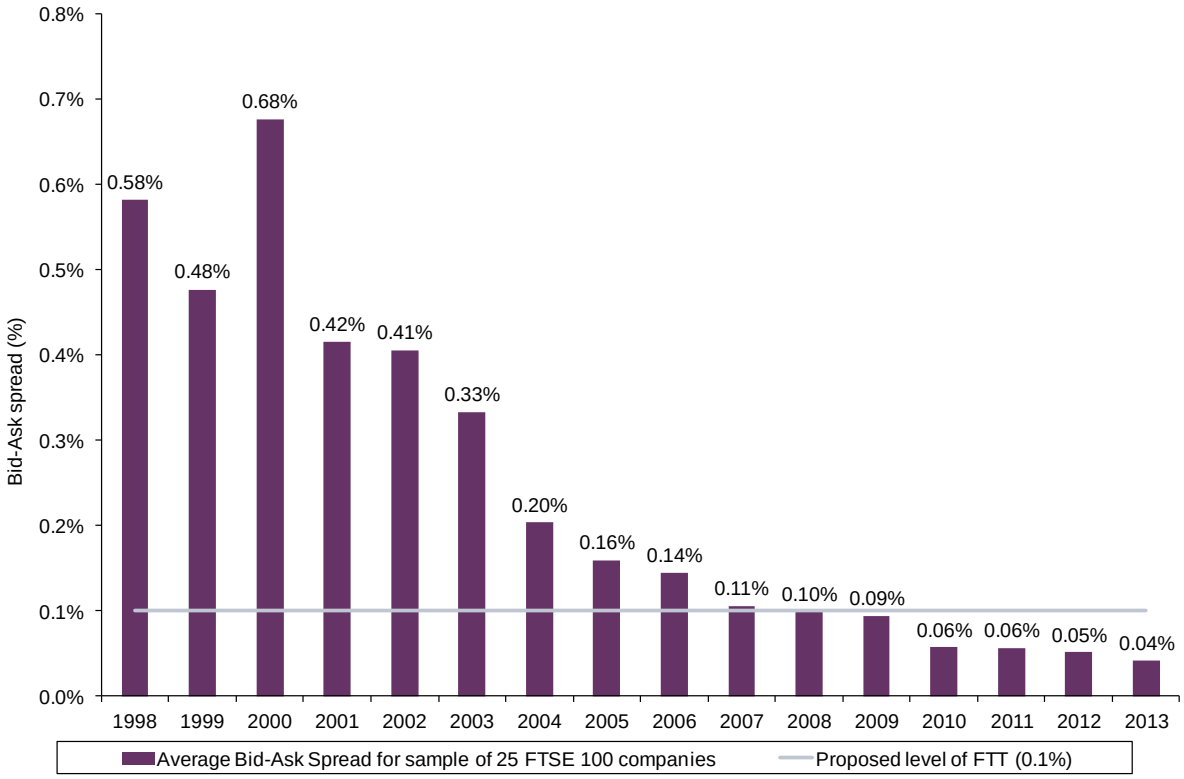
– the **end-user**—part of the cost of the tax may be passed on to the end-user, which would reduce the burden of the tax on companies, to the extent that investors would still be willing to invest despite lower returns.

[77] This is a simplifying assumption for a broad sample of equity investments, based on the sum of assumptions that the long term inflation rate is 2%, long term real risk free rate is 2% and the UK equity market risk premium is 4%.

[78] CPB Netherlands Bureau for Economic Policy Analysis (2012), 'Financial transaction tax: review and assessment', January 16th.

[79] See ITG (2013), Global Cost Review, Q1/2013, UK average commission costs. Available at: http://www.itg.com/marketing/ITG_GlobalCostReview_Q12013_20130725.pdf

Figure 3.2 Average bid/ask spread for a sample of 25 FTSE 100 companies since 1998



Note: Bid/ask spread as at May 6th 2013. Size is measured on the basis of market capitalisation values.
Source: Oxera analysis based on data from Datastream.

The exact distribution of the tax burden will depend on the elasticities of demand and supply for various equity securities along the trading value chain. In particular, the elasticity depends on the extent to which marginal investors have alternative options that avoid the tax.[80] If the marginal investor is able to invest elsewhere, without incurring the tax, companies will need to largely compensate the investor for the tax. If, on the other hand, the investor will face the tax wherever they invest, the companies will not need to raise the cost of capital in order to attract these investors.

In this case, there are arguments in both directions. Investors from outside the FTT-zone will be much less willing to accept lower (post-tax) returns, but investors inside the zone will be affected to some extent wherever they invest, as the FTT affects bank lending rates as well (see section 4). In the context of the FTT, however, it would seem likely that the marginal investors will be the investors from outside the FTT-zone, as they would respond to lower returns by investing elsewhere. This suggests that companies would need to raise returns (ie, a higher cost of equity) in order to retain those investors.

For the macroeconomic modelling, this distinction is less important, as the wedge between investor returns and the cost of capital is modelled. However, this assumption is important for looking at individual products. Oxera's analysis in this report assumes that the cost of the FTT falls on companies, which in turn means that it does not fall directly on investors, which in turn means that the impact on pension (and similar) funds is muted. This would be an area that would benefit from further empirical research in order to determine the appropriate balance between the impact on companies and the impact on investors.

[80] The marginal investor is the investor that is only just willing to buy the share at the current price.

3.3.3 Impact on the cost of equity in the UK

The analysis above considers the impact on the cost of equity in the FTT-zone. Would there be an impact on the cost of equity in the UK?

There could be an impact if FTT-zone investors (who would have to pay the FTT if they traded UK equity) are an important source of demand for the equity of UK companies. This is likely to be the case to some extent, although less so than for some other EU Member States outside the FTT-zone, such as Poland.

Theoretically, as the cost of equity is determined by the marginal investor. If a tax is imposed on that investor, it may no longer be willing to buy the share, and the share price will consequently fall until some other investor is willing to buy it. The extent to which the price of the share needs to fall depends on the relevant price elasticity of demand. In this case, this elasticity is for the whole market. The question is therefore: how far would share prices have to fall across the board to attract demand from investors to replace the demand lost from FTT-zone investors due to the burden of the tax?

National Statistics reports that 'rest of the world' investors owned 41.2% of the value of the UK stock market at the end of 2010.[81] Based on the estimate used for bonds in section 3.3, an estimated 33% of these investors will be in the FTT-zone. This suggests that 14% of UK-quoted shares are owned by FTT-zone investors.

There are unlikely to be any cascading transactions involved in the cost of the FTT for these investors, as presumably they would trade with investors in the UK (or elsewhere outside the FTT-zone). This suggests that the burden of the tax on these investors would be 0.1 percentage points.[82] With 14% of investors affected, the **overall burden would be 0.014% of the market capitalisation**. It is not clear whether this represents the required increase in the cost of equity in the UK, but the impact would appear to be small and potentially marginal from the point of view of macroeconomic modelling. The macroeconomic impact on the UK is discussed further in section 10.

3.4 Summary of macroeconomic impacts

The effect of the FTT on the cost of capital is one of the main drivers of the economic impact in the macroeconomic modelling (see Table 3.1).

Table 3.1 Summary of impact of FTT on the cost of capital

	Approximate impact (bp)
Impact on FTT-zone cost of:	
equity	40
sovereign debt	40
corporate debt	40
Impact on UK cost of:	
equity	1.4
debt	2

Source: Oxera.

[81] See National Statistics: 'Ownership of UK Quoted Shares, 2010', available from http://www.ons.gov.uk/ons/dcp171778_257476.pdf

[82] As the estimated burden is 0.4% with four cascading transactions.

3.4.1 Impact on banking funding

One of the key implications of the rise in the cost of equity and debt is a rise in the cost of banking capital. Banks must maintain a certain proportion of capital in order to ensure that they can absorb losses from borrower defaults or withdrawal of deposits and funding. The European Banking Authority has mandated that banks should reach a 9% capital ratio. A 0.4% rise in the cost of equity and debt will raise the cost of this capital reserve, resulting in a rise in the funding cost of banks by 0.036%. This impact is used later in the report in macroeconomic modelling (see section 9) to estimate the total impact of the proposals.

4 Hedging

As discussed in section 2, the financial system also involves many financial derivative transactions that are conducted by both financial and non-financial institutions in order to provide products to retail and business customers in an efficient manner. These transactions arise due to:

– financial institutions hedging positions to assist in the provision of financial products;

– non-financial institutions hedging financial positions in order to manage their own financial risk.

The Commission believes that much of the trading in the fast-growing derivatives market has little wider economic value. In its latest economic impact assessment, the Commission states that:

> It can therefore no longer be taken as granted that all this financial intermediation in the domain of derivatives markets really serves the purpose of 'oiling the wheels' of the economic fabric. Instead, it is safe to assume that significant parts of this intermediation serve the purpose of generating rents for the financial industry and at the expense of the nonfinancial economy as each individual intermediation comes at a cost, eventually to be shouldered by the non-financial part of economy.[83]

The impact assessment assumes that some 75% of derivatives trading would come to an end due to the tax,[84] but essentially this would have no detrimental economic impact as the Commission states the following:

> Finally, the fear that reduced market volumes in derivatives markets would harm the efficiency of financial markets, would increase the volatility on such markets and would make it more difficult for the non-financial and financial industry to hedge risks look largely unfounded. Instead, this rolling back of (inflated) market volumes might to a large extent boil down to a statistical effect, and a drying out of the rent-generation business models for the financial sector itself.[85]

Is this likely to be the case? In previous work,[86] Oxera has identified the following concerns about the Commission's assumption that there is no wider economic impact:

– the burden of the FTT would be much greater for some uses of derivatives for hedging purposes, particularly for highly leveraged or short-dated derivatives, and therefore some 'real world' risk management procedures may be discouraged;

– the Commission has not assessed the amount of derivatives trading that is required for real world risk management procedures, taking account of the need for market liquidity.

[83] See European Commission (2013), p. 30.
[84] Ibid., footnote 48.
[85] Ibid., p. 30.
[86] Oxera (2013), 'Analysis of European Commission staff working document on the proposed Financial Transaction Tax', May.

Box 4.1 Benefits of derivatives identified in the academic literature

The benefits of derivatives have been well-documented in the economic literature. Famously, the Modigliani–Miller theorem included the key assumptions that default was costless and that markets are frictionless (ie, adjust automatically). Using this model as its basis, a literature has developed which seeks to evaluate the benefits of derivatives through their ability to reduce the cost of default and increase the efficiency of markets. For example, Campello et al. (2011) state that:

> Hedging can lower the odds of negative realizations, thereby reducing the expected costs of financial distress. In theory, this should ease a firm's access to credit. Using a tax-based instrumental variable approach, we show that hedgers pay lower interest spreads and are less likely to have capital expenditure restrictions in their loan agreements. These favourable financing terms, in turn, allow hedgers to invest more.

Similarly, Nance, Smith and Smithson's (1993) study of the determinants of corporate hedging states that:

> Financial economics offers several hypotheses to explain the corporate purchase of hedging instruments. It suggests that hedging can increase firm value by reducing expected taxes, by reducing the expected costs of financial distress, or by reducing other agency costs.

Key papers include Mayers and Smith (1982) (expected taxes can be reduced by hedging, reduction of agency problems); Smith and Stulz (1985) (reduces cost of financial distress); and Froot, Scharfstein and Stein (1993) (reducing external financing costs from market imperfections).

Source: Modigliani, F. and Miller, M. (1958), 'The Cost of Capital, Corporation Finance and the Theory of Investment', *American Economic Review*, **48**:3, pp. 261–297. Campello, M., Lin, C., Ma, Y. and Zou, H. (2011), 'The Real and Financial Implications of Corporate Hedging', *The Journal of Finance*, **LXVI**:5. Nance, D.R., Smith, C.W. and Smithson, C.W. (1993), 'On the Determinants of Corporate Hedging', *The Journal of Finance* **48**:1, pp. 267–284. Mayers, D. and Smith, C.W. (1982), 'On the Corporate Demand for Insurance', *Journal of Business*, **55**, pp. 281–296. Smith, C. W. and Stulz, R. M., 1985, 'The determinants of firms' hedging policies', *Journal of Financial and Quantitative Analysis*, **20**, pp. 391–405. Froot, K. A., Scharfstein, D. S. and Stein, J.C. (1993), 'Risk Management: Coordinating Corporate Investment and Financing Policies', *The Journal of Finance,* **48**:5, pp. 1629–1658.

To attempt to address this lack of analysis, in this report Oxera assesses the likely level of trading of derivatives that is required for risk management procedures, and therefore the extent of the burden of the tax on derivatives trading. The analysis is set out in the following sub-sections:

– corporate hedging;
– financial products;
– examples of the impact on specific products;
– summary of macroeconomic impacts.

To address the issue of behavioural change, which is likely to be very significant with regard to derivatives, Oxera considers the minimal amount of derivatives transactions that need to take place inside the FTT-zone tax base in order for risk management and hedging functions to be delivered to FTT-zone corporates. Given the considerable uncertainties, conservative assumptions are used, which produce a similar total revenue expectation (from derivatives transactions) as assumed by the Commission. Unlike the Commission, however, Oxera does produce estimates of the economic impact that can be incorporated into the macroeconomic analysis.

As explained in the box below, Oxera assumes that a large proportion (approximately 70%) of derivatives transactions shift outside of the FTT-zone to avoid the tax, which is consistent with the Commission's assumption on the impact on trading. Due to the high degree of international mobility likely in derivatives trading, Oxera assumes that there is no loss of market quality. However, if trading were unable relocate in this fashion, there might be additional economic impacts from reduced market quality.

Box 4.2 Where will derivative transactions take place

A derivative security is essentially a contract between parties that sets out a commercial agreement between them. Unlike an equity or a bond, a derivative relating to any particular company (eg, L'Oreal) or government (eg, Italy) does not have to involve that party at all. So a derivative contract relating to L'Oreal (a company within the FTT-zone) can be created between a US bank and a UK pension fund, and would not be subject to the FTT. Similarly for a derivative relating to Italian government debt, it can be created between a Norwegian hedge fund and UK bank without any interaction with the FTT. Trading these derivatives once created can also be carried out between market participants and as long as neither of those participants themselves is resident in the FTT-zone, no FTT is payable.

Most, if not all, derivative contracts have a financial institution as one of the parties to the contract. However, for financial institutions, as a group, to find the propriety creation of, and trade in, derivatives profitable, they must transact with non financial institutions. These end users, who gain an economic value from the derivative, ultimately drive the derivative market. However, as indicated above, the instrument itself can be created outside the FTT-zone, even if it relates to an FTT-zone resident entity.

With this degree of locational flexibility, derivative creation and trading is particularly mobile. Given the structure of the FTT, this has significant implications as to where (for FTT purposes) derivative transactions will take place.

If a non financial institution wishes to become one party to a derivative contract, and it is only located in the FTT-zone, then clearly that transaction will come within the scope of the FTT. Unless the other party to the contract has to be located in the FTT zoon, the non-financial institution will have a potential choice of a counterparty within the FTT-zone or outside the FTT-zone. In most, if not all, cases this counterparty will be a financial institution. And there will be many financial institutions outside the FTT-zone who have the capability of being counterparties to many, if not all, derivative contracts.

If all that happened in a derivative contract was that it was created by the two parties to the contract and they both held on to that contract until expiry, this would be the end of the story. If one or both sides to the contract were located in the FTT-zone both sides of the transaction would, at least in theory, be taxable. However, the creation or trade in a derivative contract can (as with equity and bonds) lead to further transactions undertaken by either party, but particularly the financial institutions involved as they are likely to want to off-set the position they obtain through one derivative contract by participating in a derivative contract(s) which give them some, or all, opposite exposure. These subsequent transactions, which will largely be between financial institutions, will only be taxable if at least one of these institutions is located in the FTT-zone.

So where the financial institution will need to conduct further derivatives transactions it will have a (strong) financial interest to locate in the non-FTT zone. If it is in the FTT-zone then all subsequent transactions will be taxable, but if it is out of the FTT-zone only those with FTT-zone counterparties are taxable. Given the ability of financial institutions to create and trade in derivatives outside the FTT-zone, even when the end customers are within the FTT-zone, competitive dynamics will insure that most, if not all, derivative transactions between financial institutions will take place between financial institutions located outside the FTT-zone. This in turn means that end users located in the FTT-zone will tend to deal exclusively with non FTT-zone financial institutions to find a counterparty for whatever derivative contract they are looking for.

The outcome of this competitive dynamic is likely to be that derivative transactions involving an end user in the FTT-zone and a financial intermediary will involve a financial intermediary not in the FTT-zone (but the transaction will be taxable) while all cascading transactions between financial intermediaries themselves will be between financial institutions not in the FTT-zone and will not be taxable.

Finally, where a FTT-zone resident financial institution is itself the end user of a derivative because of some other service it is providing in the FTT-zone, then the first leg of the transaction cascade may still be taxable. But the financial institution will have the same incentive (as a result of competitive pressure) to find a counterparty who is outside the FTT-zone.

Section 4: Key findings

- Oxera's assessment of derivatives trading suggests that approximately 70% of current derivatives transactions that take place with at least one party in the FTT-zone would move completely outside of the FTT-zone to avoid being taxed; the remaining 30% would be captured by the tax. In terms of the impact on revenues generated by the tax from deriviative transactions this assumption is broadly consistent with the Commission's own assumptions.
- On this basis, the cost of the FTT applied to derivatives transactions for non-financial corporations is estimated to be €4.8 billion per annum.
- The cost of the FTT applied to derivatives transactions for bank lending is estimated to be €13.1 billion per annum. (In these transactions the bank is itself the end-user.) This can be translated into an increase in bank lending rates of 0.18 percentage points.
- The Commission's revenue expectation of €21 billion per annum from taxing derivatives transactions is broadly consistent with the findings of this analysis, but there remains a high degree of uncertainty over the final outcome.
- The FTT would affect many different financial products. Oxera has considered a small selection of them, including investments with minimum return guarantees and fixed-rate mortgages.

Source: Oxera.

4.1 Corporate hedging

Derivatives provide non-financial corporates with the opportunity to mitigate risk, in a similar way to insurance. For companies, this is an important way to remove non-essential risks and focus on their core business. Companies' interest in ensuring stable cash flows and avoiding large changes in their business environment from fluctuating interest rates or currency values is strong and derivatives offer a way to create 'floors' or 'collars' on returns and flexibly adjust to market conditions.

There has not been a great deal of research on the empirical effects of the tax on corporate hedging on which to base Oxera's analysis, due to the difficulty of identifying different users of the market and their purpose in trading. However, the recent study published by the Deutsches Aktieninstitut (DAI) finds that 24 large corporations in Germany would suffer a negative impact of €0.6–1.5 billion per annum from the tax.[87]

In order to provide further clarity on this important issue, Oxera assessed:

- the likely size of demand for derivatives by non-financial corporates;
- the size of the derivatives market required to provide derivatives to non-financial corporates;
- the consequent burden of the tax on non-financial corporates.

4.1.1 Size of demand from non-financial corporates

In order to estimate the volume of transactions of corporate derivatives in the EU11, Bank of England and Bundesbank data was collected for the market value of outstanding derivatives between banks and non-financial corporations in the respective countries (which was combined with assumptions on turnover, as explained below).[88] The Bundesbank provided only OTC positions on prominent derivative types (credit, interest rate and foreign exchange) and this is therefore an underestimate of total trading. As shown in Table 4.1 below, the Bundesbank's data does indeed have the expected lower impact, but the estimates are not excessively dissimilar to the estimates based on Bank of England data. This similarity is

[87] Deutsches Aktieninstitut (2013), 'Positionspapier des Deutschen Aktieninstituts e.V. vom 2. Mai 2013', May.

[88] Available from Bank of England Statistics Online and the Bundesbank Statistics website.

consistent with findings in DG Comp and OFT merger investigations that most derivatives are currently traded OTC, as well as Oxera's examination of derivative types on corporate balance sheets, which confirms that a large proportion of corporate volume comprises credit, interest rate or foreign exchange contracts.[89] Given this consistency, Oxera considers the Bank of England data to be a good basis on which to estimate the EU11 revenue.

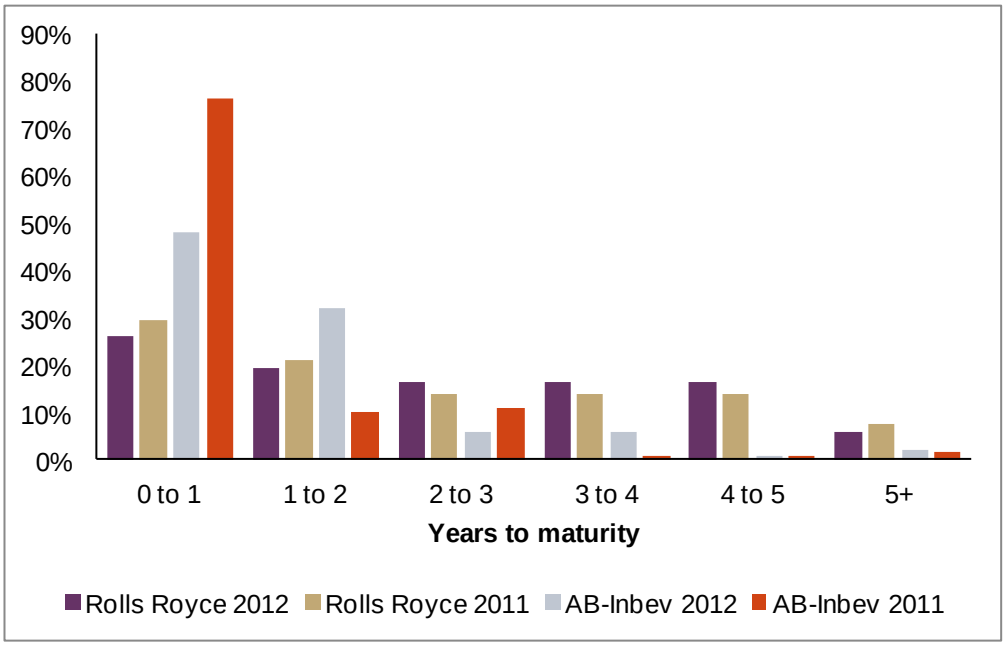
The data is expressed as outstanding positions, rather than the level of trading. In order to convert this into notional values traded, Oxera examined accounts of several leading corporations, studying the maturity profile of the holdings and the yearly changes in position reported. The derivative positions by maturity of AB Inbev and Rolls Royce are presented in Figure 4.1.

One can observe that different companies hold different hedging profiles, but that transactions are weighted towards the near term, a pattern found across companies investigated. It would not be expected that derivatives would be held to their full maturity, especially longer contracts, as these are likely to be updated as the environment changes. The usage of derivatives varies widely across different sectors, but based on the data below and on past conversations with corporate treasurers, an assumption has been adopted that an appropriate average period of time for *holding* a derivative before rehedging/expiring would be eight months.

This assumption is based purely on derivatives transactions conducted for the purposes of risk management hedging, and does not reflect other possible transactions conducted by the trading desks of corporates. With the FTT in place, more speculative trading activity is assumed to move to non-FTT subsidiaries, to avoid the tax. This assumption is not designed to be indicative of the current holding period for derivatives, which Oxera understands could be traded very regularly despite having long maturities. Rather, it recognises that post-FTT users of derivatives located within the FTT-zone have the incentive either to reduce the frequency of their trading or to move transactions outside of the FTT-zone. The result of this is assumed to be that maturity becomes a better indicator of the holding length as corporates in the FTT-zone will try to buy derivatives that suit their needs until maturity. Where holding periods increase, however, there is likely to be a negative impact on the average efficiency with which risks can be hedged through time. This will also have negative economic consequences (for example, in terms of an increase in the volatility of earnings). However, as a result of the paucity of empirical evidence in this area it has not been possible to quantify this impact. As a result of ignoring this potential impact the negative economic consequences on the wider economy of the FTT will be (probably rather slightly) underestimated.

[89] See decisions in attempted mergers of Deutsche Borse and NYSE-Euronext; BATS and Chi-X; ICE and APX-Endex for further details.

Figure 4.1 Proportion of derivative positions by holding period



Source: Oxera analysis of annual reports

Oxera applies this assumption to the outstanding value to generate a number of direct transactions. A cascade multiplier of 2 is then applied to the tax base (explained further below) to generate the full number of transactions resulting from corporate derivative use.

This provides an estimate of a hypothetical tax base for the UK. By scaling this tax base to the EU11 GDP, it is then possible to estimate the applicable revenue. This method results in a figure consistent with the estimation by the DAI when applied to Germany of €1.8 billion per annum, compared with the DAI's total estimate of €0.6–€1.5 billion per annum for 24 large corporates including liquidity management and pensions costs resulting from the FTT. Oxera would expect usage to be heavily concentrated in large firms and, following discussion with the DAI concerning methodology, considers that the two estimates are likely to be consistent with each other. These calculations are summarised in Table 4.1.

Table 4.1 Calculation of corporate tax burden (€ billion per annum)

Data	Corporate derivative notional	In-country revenue	Equivalent revenue EU11
Bank of England	1,968	1.2 (hypothetical)	4.8
Bundesbank (OTC only)	1,985	1.2(OTC only)	3.9 (OTC only)

Note: Figures are converted from £ to € at a rate of 1:1.16. Revenue scaling uses 2011 figures. Cascade assumptions are 2x and rehedging is every eight months.
Source: Oxera calculations, based on Bank of England and Bundesbank data.

4.1.2 Required size of the derivatives market

Oxera assumes that much of the corporate hedging for risk management is an activity that will continue post-FTT as there few, if any, effective substitutes for these products that would not also attract the FTT. However, as the tax base is the nominal value of the underlying, and not the value of the derivative to the corporate, there are going to be some hedging activities that are not undertaken as a result of the tax. However, these hedging activities will tend to be those where the nominal value of the underlying is high, but the value of the risk being hedged to the corporate is low. Contracts with short maturities are likely to fall into this category, as a contracts where the forward volatility (or unpredictability) of the characteristic being hedged is (thought to be) low. For any nominal value of the underlying these contracts

will tend to have a low value to the corporate, but the tax will be based on the quantum of the underlying value. The tax, even at 0.02%, may well represent a very high multiple of the price the corporate currently pays for these products so they would be unlikely to survive the imposition of the FTT.

On the other hand, derivatives with a high value to the corporate (for example, because the risk they are hedging are severe and critical to the survival of the company) will tend to have a high cost to the counter party, and therefore a high price to the corporate, for any given value of the underlying. Here, 0.02% of the underlying may represent a relatively small increase in the price the corporate is actually paying for the hedging service. The impact of the FTT will, in these circumstances, be very much more limited.

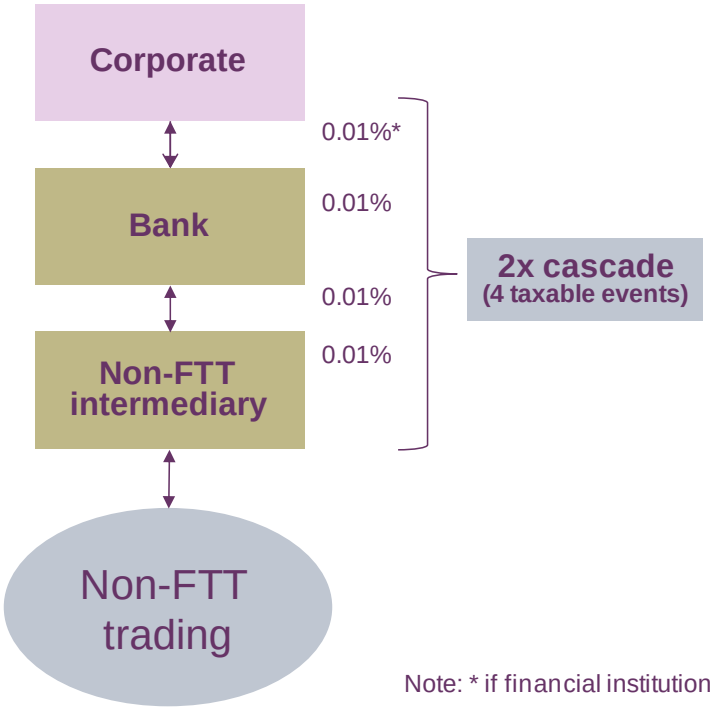
Given this dynamic, in order to model the impact on the wider economy of the FTT we have made the assumption that the current derivative trading attributed to corporate transactions is largely driven by high value (to the corporate) contracts and, as a result, will continue to be placed. However, this assumption will tend to over-estimate the revenues to be gained by the government from the FTT and, to exactly the same extent, overestimate the cost to corporates of the tax, while underestimating the economic costs of the loss of the low value contracts which will, in practice, not be entered into. The overall impact of these dynamics will tend to under-estimate the negative impact of the FTT.

Oxera expects that the economic value of hedging for the end-user corporates is greater than the 2 basis point FTT for derivatives, which would seem reasonable given the small size of the tax burden compared to the value of the position being hedged. For example, the direct tax burden on a €1 million currency hedge would be only €200, before taking account of 'cascading' transactions (which, for the reasons set out above, many of these would be unlikely to attract the FTT).

Recognising that a corporate hedging transaction will often have a 'cascading' feature whereby the counterparty in a derivative trade then hedges their own position to manage the risk, that the corporate may still not hold the contract to maturity but also that in general derivative transactions between financial institutions will often be able to escape the FTT, Oxera applied a cascade multiplier of 2 with respect to taxable transactions, ie four taxable transactions for each corporate contract. This is consistent with the multiplier applied by the DAI, and with the reasoning given in the banking impact section of this report below (section 4.2.1). Broadly, the structure envisaged is that the corporate user will transact with a bank or financial institution, which will then transact immediately with an entity outside of the FTT-zone, after which a number of other (untaxed) transactions may or may not take place.

This is a prudent assumption, which is supported by the strong incentive to avoid the tax. Recognising the varied nature of derivatives traded, Oxera does not expect this to represent all corporate transactions, but considers it to be reasonable since many, if not all, of these cascading trades are likely to be located outside the FTT. The Commission's recent statement that derivative *issue* was the territoriality principle that would be used, this suggests that it is possible for non-FTT institutions to issue derivatives linked to FTT securities without incurring the tax. Oxera considers 2 to be a representative and reasonable multiplier as many large corporates are likely to be classified as financial institutions, and it is likely that a proportion of trades will result in some unavoidable extra transactions within the zone, thus resulting in an overall average of approximately two transactions per corporate. This assumption is presented diagrammatically in Figure 4.2.

Figure 4.2 Assumption about cascading transactions



Source: Oxera.

It should be noted that this analysis is based on the assumptions of section 2.3.2 above regarding the various transactions involved in exchange-based trading of derivatives. An exchange-based transaction will involve various additional financial institutions, including brokers, clearing members, CCPs and CSDs, which are assumed either to have a complete exemption from the FTT (CCPs and CSDs) or to be exempt on the basis of conducting a transaction 'for the account of another financial institution', as the Commission described in the most recent proposed Directive. If this assumption were not the case, then the FTT would create many additional cascading transactions and would, as a consequence, create a strong deterrent from using exchange-based trading, in contradiction to regulatory objectives.

Based on these assumptions, this analysis suggests that the total amount of derivatives trading linked to the provision of derivatives to non-financial corporates in the FTT-zone would be approximately €20 trillion per annum.

4.1.3 Burden of the tax on non-financial corporates

The estimated revenue for the EU11 is €4.8 billion per annum from corporate hedging, which is likely to be a direct cost on corporates. This is because the revenue for the institutions 'in the middle' of the trade must ultimately come from the corporates requiring these transactions. This assessment of the FTT assumes that only the bare minimum of taxable trading continues in order to provide the required derivatives. As indicated above, there will be an additional impact in terms of less efficient hedging by corporate, but it has not been possible to quantify this.

4.2 Financial products

Financial institutions conduct financial transactions for the purposes of providing financial products to retail consumers and businesses. In order to provide the various functions of financial intermediation, banks and other financial services firms need to hedge their positions and manage their risk.

In order to estimate the burden of the tax on the provision of these activities, Oxera considered four of the more significant requirements for hedging activity by financial institutions:

– banking;
– insurance;
– financial investment products;
– market making.

4.2.1 Banking

The original, and fundamental, role of banks in the economy is to provide financial intermediation. Banks are large users of derivatives, both for investment and for hedging purposes. In their hedging capacity, derivatives offer banks the opportunity to manage the risks of their portfolio of loans and other assets. Typically, banks are concerned with their exposure to fluctuations in interest rates—by providing loans with fixed, capped or otherwise non-variable interest rates, banks suffer if the interest rate changes too much, and so benefit from derivatives hedging this position. Similarly, banks can hedge the credit risk of their borrowers and the foreign exchange risk for non-domestic loans or customers with strong overseas links.

Banks also trade derivatives for investment purposes—exposing themselves to (speculative) risk to earn returns, much like other investment products. Oxera assumes that this trading moves to legal entities outside of the FTT-zone, without having an impact on the cost of bank lending within the FTT-zone. This assumption is reasonable as not all banks engage in this form of proprietary trading, and therefore it can be assumed to be a separate activity (which does not subsidise bank lending rates). Oxera does estimate, however, the potential impact on economic output due to the loss of this activity.

In order to identify derivative trading that is necessary for typical banking operations, Oxera examined the derivatives trading of 'utility' banks—banks that focus predominantly on the traditional loan provision function of banks. Oxera investigated several banks and found that it was possible to ascertain the use of derivatives for hedging (and therefore use for the provision of bank services). In a similar methodology to that set out in Oxera's 2011 analysis of the impact of the FTT, calculating the tax cost for a representative 'utility bank' enabled Oxera to identify an impact on lending rates. There are two key assumptions behind this representative institution methodology: the representative bank is indeed representative in the correct manner; and the nature of the transmission process relates to the tax burden.

To address the first key assumption, Oxera's representative 'utility bank' used for analysis is Nationwide building society. Nationwide is assumed to be a suitable banking institution for this analysis as over three-quarters of its assets are loans to customers, Nationwide states that it uses derivatives for hedging purposes only and not for speculation, and that it does not have large foreign operations. In effect, Nationwide fits the profile of a bank focused on traditional retail banking. When compared with other financial institutions such as Rabobank in the Netherlands and The Royal Bank of Scotland, derivative hedging use was found to be similar to Nationwide. Thus, Oxera considers that Nationwide's use of derivatives can reasonably represent the minimal use of derivatives needed for provision of banking services. Therefore, post-FTT, it is assumed that Nationwide would continue to use these derivatives to ensure that its risk was suitably low.

The impact of the tax on Nationwide was calculated and compared with its loan portfolio size. This analysis is summarised in Table 4.2. The notional derivative value from Nationwide's balance was used to create a tax base by using a cascade multiplier of 2 and a turnover assumption of 3 (ie, the portfolio of derivatives are traded every four months). The multiplier of 2 indicates a single middleman located within the FTT-zone—for example, a market-maker or broker/clearing member acting for the end-user (counterparty to the bank), or an intermediary taking the transaction out of the FTT-zone. This is due to the financial sophistication of banks, suggesting that for some transactions there will be no other FTT-

zone counterparty, but for other, more complex transactions there may be more intermediaries, akin to the situation in corporate hedging. **It is important to note that many other related transactions may continue to occur outside of the FTT-zone, and therefore may not be taxed**.

It would not be prudent to assume more than one extra cascading transaction, as there is a strong incentive for derivatives transactions to be relocated to a financial centre (such as London) outside of the FTT-zone. This is a critical feature of the highly mobile derivatives market.

The cost of the tax on the required hedging activities was calculated to be 0.18% of the value of the loans to customers.

Table 4.2 Tax cost for bank lending—Nationwide, 2012

Derivatives notional value (£m)	Tax cost (£m)	Loans (£m)	Impact as % of loans
226,487	272	154,169	0.18%

Note: The tax cost of £272m is equal to the outstanding position at year end (£226,487m) times the turnover (3) times the number of cascading transactions (2) times the effective tax rate per transactions (0.02%). A bi-monthly rehedging assumption and single intermediary assumptions were used to calculate the tax cost. As all transactions were hedges, they were assumed to continue after the introduction of the FTT.
Source: Oxera, Nationwide Annual Report 2012.

This tax burden relative to the loans to customers (the primary asset of a 'utility bank') represents that amount that the bank's lending rate would have to rise by in order to maintain its lending margins. Simply put, a cost of 0.18% of each loan is borne by the bank, and this must be paid for by reducing margins, charging borrowers an extra 0.18%, or by offering depositors/investors 0.18% less.

The calculation of the revenue concerns the second key assumption, that Nationwide is representative of activities which are essential for delivering standard financial products. Nationwide is clear that it does not undertake transactions for the purpose of market trading, so it would appear to provide a useful basis for estimating the required activities of a 'utility' bank. To appropriately calculate the revenue and impact implications, applying these calculations to the loan volume of the EU and adjusting for the relative size of the FTT-zone, generates revenue of €13.1 billion per annum, approximately 60% of the Commission's latest estimate of €21.0 billion per annum revenues from the FTT on derivatives trading for the FTT-zone.[90]

Oxera assumes that the tax burden is passed on by the bank to its loan consumers, rather than to depositors or by reducing margins within the bank. These assumptions of tax passed through from the bank are supported by academic evidence, which was briefly summarised in section 2.3. Huizinga, Voget and Wagner (2012) find that an increase in taxation on banking activities with respect to foreign activities was close to 100% pass-on of the tax costs, leaving lending margins unchanged.[91] Furthermore, if one inspects the above shock, it can be seen that this is identical to the bank suffering a monetary shock—ie, it suffers an external increase in the cost of its activities. Evidence on the pass-through of rate increases from central banks suggests that near to 100% of increases are passed through within

[90] See European Commission (2013), op. cit., p. 24.

[91] Huizinga, H., Voget, J. and Wagner, W. (2012), 'International Taxation and Cross-border Banking', Oxford University Centre for Business Taxation, Working Paper 12/25, October.

several months (due to delays in updating pricing) and Oxera would therefore expect the FTT to be similarly passed through.[92]

The above suggests the cost of the tax will be borne by parties other than the bank, but does not specify whether this is borrowers or depositors. Oxera suggests that it is most appropriate to model the impact on borrowers as banks have already squeezed depositors close to or below zero real returns and are under pressure to build deposits in order to reduce reliance on wholesale funding. Furthermore, supporting evidence from Sørensen and Werner (2006) suggests that, of banking products, corporate loans are the most responsive to rate increases and that, in general, deposits are affected the least.[93]

According to the above assumptions, **derivative taxation is likely to raise bank lending interest rates by 0.18 percentage points**.

However, this is not the only impact on banks. They also experience a number of other changes relating to funding options and investment options, which are discussed in section 4.4.1.

This estimate of 0.18 percentage points also assumes that banks are able to minimise the number of cascading transactions to 2. This may have implications for the extent of exchange trading/clearing of derivatives that can occur within the FTT-zone, as the banks may not be clearing members of exchanges. While the CCPs would be exempt from the FTT under the proposals, this may create incentives to relocate exchanges outside of the FTT-zone. This may have implications for other aspects of regulatory policy objectives.

4.2.2 Insurance products

The revenue (and cost) impact from (on) insurers from the tax has also been considered. Broadly, this follows a methodology similar to the representative bank approach used in section 4.2.1. To estimate the FTT revenue from insurance, a similar approach to the above was used; namely, a representative-institution approach. Similar to banking, a cascading assumption of a single middleman was used since insurers are complex financial entities that should not require many intermediaries. The institution chosen for benchmarking was the large UK insurer Aviva, which makes up approximately 5% of the EU-wide insurance market.[94]

Examining insurers' financial statements, Oxera found that derivatives were held both for investment and for hedging, but had long maturities, many beyond five years (see Table 4.3). Oxera considered that although these instruments would not all be held to maturity (ie, that positions would sometimes be updated following new information), the average holding period is still likely to be long. It was decided that, given the long maturity and the disincentive to trade post-FTT, an average holding length of five years was appropriate.

Table 4.3 Derivative liability maturities, Aviva 2012

	Proportion (by value)
Within 1 year	16%
1 to 2 years	13%
2 to 3 years	5%
3 to 4 years	11%

[92] For example, see Gambacorta, L. (2004), 'How do banks set interest rates?', *National Bureau of Economic Research Working Paper Series*, 10295, Sørensen, C.K. and Werner, T. (2006), 'Bank Interest Rate Pass-through in the Euro Area: A Cross Country Comparison', European Central Bank Working Paper Series no. 580, and De Bondt, G. (2002), 'Retail Bank Interest Rate Pass-through: New Evidence at the Euro Area Level', European Central Bank Working Paper Series no. 136.

[93] Sørensen, C.K. and Werner, T. (2006), 'Bank Interest Rate Pass-through in the Euro Area: A Cross Country Comparison', European Central Bank Working Paper Series no. 580.

[94] Aviva states its market share online at http://www.aviva.com/reports/2009ar/performance/information-on-the-company/europe.html.

4 to 5 years	3%
Greater than 5 years	52%
TOTAL	**100%**

Source: Calculations based on Aviva Annual Report 2012, page 265.

Applying these assumptions to the accounts of Aviva, Oxera derived an FTT revenue of €242m per annum. This value was the preferred estimate from a range of €236m–€284m using different scaling techniques.

Once again, it can be assumed that this cost is passed on to consumers, as the tax applies to all suppliers in a competitive market. In addition, it may be difficult for firms to squeeze margins already constrained by low returns from investment, low interest rates and increasing regulatory requirements.

4.2.3 Financial investment products

A large number of investment products utilise derivatives in order to reduce the risk of the product or to reduce risk for the institution providing the product. Oxera would find it unreasonable to declare that all, or a very large proportion of, the use of derivatives in investment products has no real economic value, especially given the recent growth and popularity of index tracking funds and other similar products (if anything the ideal method with which to circumvent rent-generating financial institutions).

It is difficult to estimate the required use of derivatives for such a varied group of activities. Instead, Oxera examined specific examples of products, as described in section 4.3.

4.2.4 Market making

Another key use of derivatives is for hedging market-making activities. Market makers must often take large positions in their products to fulfil their obligations to provide a price even during times of market stress, as well as using derivatives to hedge those positions and ensure their own stability. As discussed in Oxera (2013) on the effects of the FTT, it is expected that market makers' costs will increase, causing negative impacts on markets through decreasing liquidity and increasing volatility.

The impact of the tax on derivatives for market making is difficult to assess, but clearly represents an additional cost to these activities.

4.3 Examples of the impact on specific products

Oxera has examined the impact of the FTT on specific financial services products, including:

– a repayment loan to a small business;
– an investment product with minimum return guarantees;
– a fixed interest rate mortgage; and
– pension funds.

4.3.1 Repayment loan to a small business

As explained in section 4.4.1 below, Oxera's research suggests that, on average, bank lending rates would rise by around 0.225 percentage points, after taking into account the increase in costs of hedging, using repos and other impacts of the FTT. To put this into perspective, Oxera considers the impact on a small business borrowing €100,000 repaid steadily over ten years.

The FTT would increase the annual interest rate by 0.22 percentage points, in this illustration. Assuming that the company repays €10,000 each year, this would suggest that the company has to pay an additional €1,200 of interest as a result of the FTT. This is independent of the level of the interest rate paid by the company. The calculations are presented in Table 4.6.

4.3.2 Investment product with minimum returns

Oxera (2011) analysed the impact of the FTT on the return of a financial product which guarantees minimum returns. These products normally utilise derivatives in order to fulfil the guarantees and promised outcomes for the purchaser. Although some products use a large number of frequently updated derivatives, Oxera's example is a more conservative index-tracking investment which limits losses to 20% of the original investment.

Table 4.3 presents the results of this analysis in terms of the impact on the expected return of the fund, which is assumed to be 5% before the tax is imposed. The proposed FTT affects the expected return of the fund in the following ways:

– the tax on the transactions required in the management of the tracker fund, including some cascading effects (approximately 0.1% based on passive trading assumptions used for the pension fund analysis, doubled to 0.2% due to cascading effects);

– the tax on the put options (12 transactions in one year at an effective rate of 0.02%, rounded down from 0.24% to 0.2% due to the uncertainties involved);

– the increase in the price of the put option due to the tax cost of associated transactions (assumed to be similar to the direct tax on the options).

To provide a conservative estimate, Oxera assumes that the FTT is not applied to the purchase and sale of the fund by the end-user, as this is assumed to be exempt.

The FTT in this example reduces the expected return from the fund from 5% to 4.4%. This would be a large reduction in the expected return of the fund, sufficient to result in a reduction in retail demand. Customers would be encouraged to choose other funds that involve less trading, such as funds that provide no guarantee on capital and funds that do not follow a tracker but instead have minimal levels of trading (eg, fixed positions in different companies). This change in customer preferences may not be desirable from a social point of view, however, as they would increase risk exposure.

Table 4.3 Expected return on a retail investment (%)

Illustration	Return on investment
Expected return	**5**
FTT on fund management	–0.2
FTT on put option	–0.2
Increase in put option price due to FTT	–0.2
New expected return	**4.4**

Source: Oxera.

To put this illustration into context, the burden of the tax is calculated for a ten-year investment period. Each year, returns at 4.4% rather than 5% would mean that the returns on a ten-year investment would be reduced by 9% of the original investment (eg, a €90 reduction on returns from a €1,000 investment.

The FTT on fund management in this illustration does assume that all the burden of the tax falls on investors (through lower post-tax returns) rather than companies and governments (through higher pre-tax returns). If the burden of the tax on equity and bond transactions falls on companies and governments, the impact on the returns would be 0.4% rather than 0.6%. This illustration is instructive, however, as it shows how the burden of the tax can be material with cascading transactions and associated derivatives.

4.3.3 Fixed rate mortgage

A fixed-rate mortgage is a simple and common financial product used by many consumers. However, from the lender's point of view, it is relatively high-risk as they agree to receive a fixed rate from the borrower but must themselves operate in changing and variable conditions—for example, if interest rates rise significantly, the bank will possibly receive less income from the mortgage than the bank's funding cost (which will rise with interest rates) and make a loss. Derivatives offer a way to hedge the interest rate and the underlying credit risk. In Table 4.4, the impact of the tax on a fully hedged mortgage is presented for the purposes of illustration (noting that the cost of the FTT for this type of hedging is already included (implicitly) in the analysis of bank hedging above). In this example, it is assumed that there is a cascade multiplier of 2, in line with the analysis of the banking industry above.

Table 4.4 Fixed-rate mortgage illustration (€)

Notional value of mortgage	**200,000**
Full interest rate swap tax paid	40
Full credit default swap tax paid	40
Full tax paid	**80**
Tax as % of mortgage fees	**5.3%**
Tax as % of mortgage value	**0.04%**

Note: Fees are assumed to be approximately €1,500, in line with samples from moneysupermarket.com.
Source: Oxera, moneysupermarket.com.

At €80 the cost of the hedging is not particularly large relative to the size of the loan, but does add significantly to the cost of arranging the mortgage. This cost would be incurred each time a new fixed-rate mortgage deal is arranged.

The increase in costs could be larger if there were additional cascading transactions, or if market quality were affected by the FTT. In addition, there may be a cost for any collateral which the bank needs to post in order to hedge these positions.

4.3.4 Pension fund

As the Commission stated in its recent impact assessment, pension funds could suffer significant losses when actively managed. The Commission provides an illustration of an actively managed Dutch pension fund, and finds that the FTT will reduce the final retirement income of the pension by 7.92%.[95] In contrast, it finds that a passive Dutch fund, mainly holding bonds from issuance until redemption, would see a reduction in final pensioner incomes of only 0.08%. This would clearly be a very significant impact on pensioner incomes given an active strategy, but not if the money is instead invested in government bonds with very little trading. The Commission do not assess the economic impact of this, but instead concludes that:

> The FTT would favour investments in more passive investment vehicles. Also, due to reduced churning and hedging by these vehicles themselves the latter's substantial management fees would have a potential for being reduced. The partial crowding out of 'spread internalisers' or high frequency traders should also help both pension funds themselves and the vehicles in which they invest to get better deals on financial markets.
>
> In sum, the impact of the common system of FTT in EU11+ can be expected to have a rather limited impact on pillar II and pillar III pension funds and their beneficiaries.[96]

[95] See European Commission (2013), p. 37.
[96] Ibid., p. 38.

The Commission's assumption of a 'rather limited impact' therefore relies on the belief that there are no costs associated with adopting a passive, government bond strategy, despite evidence that government bonds underperform equity in the longer term.[97]

Oxera (2011) also looked at this issue, and found an impact of 5.46% on pensioner incomes for a pension fund adopting a mixture of active and passive strategies consistent with allocations observed in the market, assuming that the cost of the tax falls on investors (in the form of lower post-tax returns) rather than companies (in the form of a higher cost of equity or debt).

It is important to note that Oxera assumes that the cost falls on companies and governments for the purposes of the macroeconomic assessment (see section 3.2). This would suggest that the impact on pensioners is actually quite limited, as it is companies and governments that bear the tax.

4.4 Summary of macroeconomic impacts

The assessment above produced various estimates of the FTT revenue collected for different risk management activities, which are summarised in Table 4.5. The assessed revenue from corporate hedging was €4.8 billion per annum and from banking was €13.1 billion per annum, which sum to €17.9 billion per annum. Additional revenue can also be expected from insurance and investment products and market making activities, but these are difficult to assess.

The Commission estimates revenue of €21.0 billion per annum from derivative trading, which the analysis here suggests is not unreasonable. In order to assist comparisons of results with the Commission's analysis, Oxera therefore adopts this total figure, which implies that revenue from other activities where an estimate was difficult to calculate would be €3.2 billion per annum.[98]

Table 4.5 Summary of FTT derivatives trading revenue estimates (€ billion per annum)

	Approximate impact (€ billion per annum)
Corporate hedging	4.8
Banking	13.1
Insurance	
Financial investment products	3.2
Market making	

Source: Oxera.

For the macroeconomic model, the burden of the FTT on derivatives trading is assessed in two forms:

– a cost increase for companies from corporate hedging and other financial products (other than banking);

– an increase in the bank lending rate to all retail and corporate banking customers.

[97] The primary source of evidence for long-term bond and equity returns is Dimson,E., Marsh, P. and Staunton, M. (2002), *Triumph of the Optimists: 101 Years of Global Investment Returns*, Princeton University Press (more recent updates available online). For analysis of these results in the context of pensions, see Oxera (2008), 'Defined-Contribution Pension Schemes: Risks and Advantages for Occupational Retirement Provision', report for EFAMA, January.

[98] Equal to €21.0 billion minus €17.8 billion.

The cost increase for companies is calculated according to the figures in Table 4.5, excluding the cost for banking.

4.4.1 Cost of financing for bank lending

The model of the impact on bank lending rates also takes as an input the cost of financing. As noted above, the estimated increase in bank lending rates due to the cost of the FTT on required hedging activities is 0.18 percentage points. This is supplemented by the impacts from the repo market and from the increase in the cost of equity and debt to result in a final impact of 0.225 percentage points, as shown below.

Table 4.6 Cumulative impact on bank lending rates

	Impact (%)
Component	
Derivative hedging cost increase	+0.176
Repo market:	
revenue burden	+0.002
deadweight loss	+0.012
Cost of capital increase	+0.036
Total bank lending rate rise	**+0.225**

Source: Oxera calculations.

The cost of equity and cost of debt impact of 0.4% is also used. Since companies generally fund themselves using bank-based (or other similar credit institution) loans or equity/debt, the cost shock to funding is calculated as a rounded midpoint of these two figures, **0.31%**. This is justified on the basis that only the largest firms in the economy are able to use capital markets, but these firms still account for a large proportion of the economy, due to the distribution of firm size.[99]

4.4.2 Corporate cost shock (other than for banking)

The combined corporate cost shock to the FTT-zone will be €7.9 billion per annum, which is equal to the €4.8 billion per annum for non-financial corporates and the €3.2 billion per annum for other (non-banking) financial corporates. This cost shock is spread out among the 11 Member States in line with their GDP, for the purposes of inputting into the macroeconomic model.

[99] In the USA, the largest 100 firms represent 29% of the economic output, Gabaix, X. (2011), 'The Granular Origins of Aggregate Fluctuations', *Econometrica*, **79**:3, pp. 733–72.

5 Energy markets

The FTT is expected to have an impact on energy markets as it will be applied to transactions in energy-related derivatives, such as futures contracts. This impact will depend on the burden of the tax relative to the size of the energy market. Oxera's analysis finds that this burden would appear to be relatively small, which suggests that most trading would be likely to continue. This analysis is described below, looking at:

– the scope of the tax with regard to energy markets;

– the impact on electricity and gas markets;

– the impact on oil markets;

– the impact on the macroeconomic assessment.

5.1 The scope of the tax with regard to energy markets

Oxera has investigated the likely scope of the tax with regard to energy markets, and in particular whether physically settled transactions are likely to be taxed.

Article 2 of the revised proposal for an FTT under enhanced cooperation defines the scope of the taxable instruments. Paragraph 4 is relevant for the definition of derivative contracts and makes direct reference to MiFID, Annex I, Section C. Clause 6 is relevant here: 'Options, futures, swaps, and any other derivative contract relating to commodities that can be physically settled provided that they are traded on a regulated market and/or an MTF.' This means that trading of physical European commodity forwards (eg, a forward contract for gas) on regulated markets could be within the scope of the FTT, despite being physically settled. There is uncertainty surrounding this, as Clause 6 does not specify 'forwards', and so inclusion of forwards could be subject to legal challenge (particularly if there is an FTT, of course). It is possible that MiFID II could exclude physical forwards from the definition of a financial instrument, although this is highly uncertain at this time.

On the basis that physical forwards are assumed to be caught by Clause 6, Oxera's analysis of the European electricity and gas markets includes physical forwards, exchange-traded and OTC derivatives (see Table 5.1 below).

Table 5.1 Overview of trading in European energy derivatives

Market	Cash or physical settlement?	Total volume traded in 2012	Value of trading volumes (€ billion per annum)	Proportion of energy derivative trading (by value)
Natural gas		**(GWh)**		
UK NBP	Physical	12,454,000	249	23%
Netherlands TTF	Physical	7,117,000	142	13%
Germany NCG	Physical	1,028,000	21	2%
Germany Gaspool	Physical	510,000	10	1%
France PEG	Physical	284,000	6	1%
Other gas		946,000	19	2%
Electricity		**(GWh)**		
UK	Either	870,000	43	4%
German	Cash	5,199,000	260	24%
French	Cash	429,000	21	2%
Nordic	Cash	170,000	9	1%
Italy	Cash	367,000	18	2%
Other power		1,116,000	56	5%
Coal		**(mt '000)**		
API 2 Rotterdam	Cash	1,629,000	147	14%
API 4 Richards Bay	Cash	329,000	30	3%
Other Coal		340,000	31	3%

Source: London Energy Brokers' Association. Cash or physical settlement was determined from relevant contract specifications.

The notional value of European electricity and gas derivative trading used in Oxera's analysis is based on applying wholesale energy prices to the trading volumes in 2012 as recorded by the London Energy Brokers' Association (LEBA). The Association captures all brokered trades (both OTC and exchange trades), but does not capture bilateral trades that do not involve an energy broker. As such trades by definition do not involve a financial institution, they would be outside the scope of the FTT. Spot trades have not been specifically excluded from the analysis above, on this basis.

The impact of the FTT on the European oil derivative market has been estimated based on the trading volumes of ICE Brent futures, as reported by ICE.[100] This excludes OTC trades, as such trades are physically settled and away from regulated markets (see section 5.2 below). These trades will fall outside the scope of the FTT and therefore this exclusion does not result in an underestimate. Oxera note that this approach will exclude some transactions, such as those futures based on the West Texas Intermediate (WTI) benchmark, but these exclusions were deemed to be reasonable given the limited extent to which these futures are traded in Europe by European financial institutions (and therefore subject to the FTT). For similar reasons, emissions trading was not included (deemed to be relatively immaterial for the purposes of this estimation). Further details are provided below.

[100] See https://www.theice.com/marketdata/reports/ReportCenter.shtml?reportId=28&productId=254&hubId=403#report/28/reportId=28&productId=254&hubId=403, accessed May 23rd 2013.

5.2 Impact on electricity and gas markets

Table 5.2 presents data on exchange-traded and OTC energy derivatives.

Two observations can be made:

– as with all European derivative markets, a large proportion of institutions trading in energy derivatives are established in the UK and are therefore outside the FTT zone. They would pay a tax only if the user is based in the FTT-zone;

– not all energy derivative trades will be directly affected by the FTT. While MiFID II is expected to eliminate some of the exemptions from financial rules that energy companies currently benefit from, smaller energy companies that trade derivatives only to hedge their underlying business are not expected to become classified as financial institutions (the primary target of the FTT). As such, they will not be subject to the FTT (although their broker with whom they trade would be subject to it).

To estimate an upper bound of the impact of the FTT on the energy markets, the tax rate of 0.01% can be applied twice to the total value of trading in energy derivatives, on the strong assumption that both sides of each transaction meet the definition of 'financial institution' and are established within the FTT-zone. This generates an upper-bound estimate of the cost of the FTT to the energy commodity market, of €220m per annum.[101] Assuming that this is passed through in full to retail prices, the impact on retail gas prices is expected to be 0.06%[102] and on retail electricity prices 0.03%.[103] Equivalently, for a household with an average gas bill of €500, this would mean a price increase of €0.30, and for a similar €500 electricity bill, a price increase of €0.15.[104]

A more realistic assumption is that a large proportion of energy derivative trading moves to jurisdictions outside the FTT zone in order to avoid the tax. Indeed, a large proportion of energy derivative trading is already likely to be conducted by UK established institutions and institutions such as small energy companies that will not be subject to the FTT. Assuming that 70% of trading in energy derivatives avoids the tax will reduce the expected cost to €66m,[105] with a consequential impact on gas prices of 0.02% (a €0.10 increase on a €500 gas bill) [106] and electricity prices of 0.01% (a €0.05 increase on a €500 gas bill).[107]

[101] €220m = 0.01% * 2 * €1,097,632m, where €1,097,632m is the estimated total notional value of European energy trading (ie, the sum of the notional value of trading as reported in Table 1.1).

[102] In 2011, 2.71m GWh of gas was consumed in the EU 27 (according to EuroStat). Applying an average retail price for gas of €0.07 implies that the value of the gas consumed was €190 billion. Attributing 100% of the FTT revenue specific to wholesale gas derivative trading and 35% of the FTT revenue from coal and emissions trading to the European gas market creates a total tax cost of €106m for the European gas market. €113m is 0.06% of €190 billion. Therefore, if the cost of the FTT were to be passed on in full to consumers, retail gas prices would increase by 0.06% .

[103] In 2011, 2.77m GWh of electricity was consumed in the EU 27 (according to EuroStat). Applying an average retail price for electricity of €0.13 per KWh implies that the value of the electricity consumed was €360 billion. Attributing 100% of the FTT revenue specific to wholesale power derivative trading and 65% of the FTT revenue from coal and emissions trading to the European gas market creates a total tax cost of €113m for the European electricity market. €113m is 0.03% of €360 billio. Therefore, if the cost of the FTT were to be passed on in full to consumers, retail electricity prices would increase by 0.03% .

[104] Calculated as: €500*0.06%=€0.30 and €500*0.03%=€0.15.

[105] Calculated as: €220m*30%=€66m.

[106] Calculated as: 0.06%*30%=0.02% and €500*0.02%=€0.10.

[107] Calculated as: 0.03%*30%=0.01% and €500*0.01%=€0.05.

Table 5.2 Impact on trading in European energy derivatives

Market	Total volume traded in 2012	Approx. value of trading volumes (€ billion per annum)	Estimated tax revenue (€ m per annum)
Natural gas	**(GWh)**		
UK NBP	12,454,000	249	50
Netherlands TTF	7,117,000	142	28
Germany NCG	1,028,000	21	4
Germany Gaspool	510,000	10	3
France PEG	284,000	6	1
Other gas	946,000	19	4
Electricity	**(Gwh)**		
UK electricity	870,000	43	9
German electricity	5,199,000	260	52
French electricity	429,000	21	4
Nordic electricity	170,000	9	2
Italy electricity	367,000	18	4
Other electricity	1,116,000	56	11
Coal	**(mt '000)**		
API 2 Rotterdam	1,629,000	147	29
API 4 Richards Bay	329,000	30	6
Other coal	340,000	31	6
Emissions	**(mt '000)**		
EUA	2,406,000	24	5
CER	1,003,000	10	2
Other emissions	237,000	2	0
Total	–	1,098	220

Note: Trading volumes are as reported by London Energy Brokers' Association for 2012. Value of trading has been calculated applying the following average settlement prices: €20/MWh for gas trades, €50/MWh for electricity trades, €90/mt for coal trades and €10/mt for emissions. These approximate settlement prices are based on the settlement prices used by the Financial Services Authority in its 2012 analysis of activity in the energy markets.
Source: London Energy Brokers' Association (2012), 'London Energy Brokers' Association December 2012 volumes in gas power emissions and coal', December. FSA (2012), 'Analysis of activity in the energy markets 2012'.

5.3 Impact on oil markets

The oil derivatives market is another market that may be affected by the FTT.

During 2012, trading in ICE Brent futures accounted for 156.3 billion barrels of oil. Assuming an average settlement price of €76 per barrel implies a notional value of €11.8 trillion. The impact of the FTT on European oil trading is not expected to be substantial because a high proportion of institutions trading oil derivatives are established outside the FTT-zone. The large European oil companies Vitol, Shell and BP are all outside the FTT-zone, for example. Even some oil companies that are located in the FTT-zone currently trade via non-FTT subsidiaries, for tax advantages; for example, Total trades on ICE via its Swiss subsidiary.

Assuming that 90% of trading in ICE Brent futures avoids the tax, the cost of the tax can be estimated to be €238m per annum.[108]

The impact of the FTT on oil markets could translate into higher costs for oil companies. For example, pension funds and other institutional investors choosing to invest in oil companies in order to benefit from expected productivity improvements may trade in oil futures to hedge the exposure of their investments to changes in oil prices. An increase in the cost of trading oil futures could therefore translate into a higher cost of capital for oil companies with a final impact on the cost of oil products. As the impact of the FTT on oil futures trading is expected to be 0.002% of the value of oil futures trading, the impact on the cost of capital for oil companies is unlikely to be substantial, however.

5.4 Impact on the macroeconomic assessment

As the companies covered in the corporate hedging impact include energy companies, the analysis of the corporate hedging impact already contains much of the impact on energy markets. If an additional impact were included for energy markets, this would be likely to result in double-counting. This is because the impact on corporate hedging accounts for the ultimate impact on consumers of raising costs for corporates, including energy companies.

This assessment is explained below.

5.4.1 Treatment of energy companies in corporate hedging calculations

Oxera has used three sources of data on corporates' usage of derivatives: data collected by the Bank of England on non-financial corporations; data collected by the Bundesbank; and data collected through a survey among large German corporate undertaken by the DAI specifically for the purpose of estimating the impact of the FTT on corporate derivative users. These three data sources result in roughly consistent estimates of the FTT's impact on corporate, but to what extent do they also include data on the usage of derivatives by energy companies? This is examined below.

Data from the Bank of England

The Bank of England uses Office of National Statistics SIC codes as its categorisation, and states that: 'Any subsidiary of a parent group incorporated in the UK should be classified to the main activity of the parent (except where the member of the group concerned is a bank).' This means that energy companies are included in the data on non-financial corporations—even if the subsidiary were classified as a financial institution under MiFID, the parent company will be an energy company and data on the usage of derivatives by the subsidiary will therefore still be included in the Bank of England data on non-financial corporations.

Non-financial corporations are defined by the Bank of England as corporations that do not engage in financial activities. The list of companies included in the SIC categories of 'financial corporations' contains all banks, and many other financial services companies, but does not contain any energy companies. This also indicates that energy companies are indeed included in the data on non-financial corporations.

Bundesbank data

Bundesbank has informed Oxera that its data is compiled according to BIS categories, the requirements and definitions of which it forwarded to Oxera. In particular, the BIS (quoted by the Bundesbank) states,

> Reporting institutions are requested to provide for each instrument in the foreign exchange, interest rate, equity, credit and 'other' derivatives risk categories a

[108] Calculated as €11.8 billion*0.01%*2*10%, where 0.01% is the proposed tax rate for derivatives, and is applied twice as both sides of the transaction are subject to the FTT, and 10% is to account for the proportion of Brent futures trading that is expected to be subject to the tax.

breakdown of contracts by counterparty as follows: reporting dealers, other financial institutions and non-financial customers.

The Bundesbank further stated:

> 'Reporting dealers' are defined as those institutions whose head office is located in the 13 reporting countries and which participate in the semi-annual OTC derivatives market statistics; in addition, reporting dealers include all branches and subsidiaries of these entities worldwide; 'reporting dealers' will mainly be commercial and investment banks and securities houses, including their branches and subsidiaries and other entities which are active dealers.
>
> 'Other financial institutions' covers all categories of financial institution not classified as reporting dealers, including banks, funds and non-bank financial institutions which may be considered as financial end-users (e.g. Central counterparties (CCPs), mutual funds, pension funds, hedge funds, currency funds, money market funds, building societies, leasing companies, insurance companies, central banks).
>
> A 'non-financial customer' is any counterparty other than those described above, in practice mainly corporate firms and governments.[109]

The above would suggest that energy companies are included as they are not 'financial end-users' and would therefore either be banks or non-financial corporations, and hence would report their trades (in the former case) or would have their trades reported (in the latter case) and be included in Oxera's data.

Further examination of the BIS reporting guidelines and the Bundesbank's categories shows that the Bundesbank has a similar breakdown of firms, which are shown below.

Table 5.3 Breakdown of firms in analysis

Category	Could include energy company?	In Oxera's data?
Banks	Yes	Yes
Insurance companies and pension funds	No	No
Investment companies	No	No
Financial vehicle corporations	No	No
Non-financial firms	Yes	Yes

Source: http://www.bundesbank.de/Navigation/EN/Statistics/Banks_and_other_financial_institutions/banks_and_other_financial_institutions.html, accessed June 5th 2013.

In summary, therefore, energy companies appear to be included in the analysis of the cost of the FTT to corporate hedging, and therefore the impact on energy markets is included in the macroeconomic assessment.

[109] Email to Oxera from Bundesbank, May 24th 2013.

6 Repurchase agreements

The sale and repurchase ('repo') market is an important element of the operation of the financial system. Repos allow participants to legally exchange ownership of a particular asset for a limited period of time in return for a payment and a corresponding asset. Repos therefore allow banks and other financial institutions to turn less liquid long-term assets into highly liquid assets (eg, cash) on a temporary basis, which allows them both to hold higher-yielding assets and to access liquidity whenever required.

Repos are also widely used as part of central bank operations as a safe method to generate returns for stable, cash-rich institutions and as a route to secure assets required for collateral to take part in CCP-cleared transactions. They also enable primary dealers to finance their positions during issue of securities and encourage the trading of less liquid assets through the option to exchange them for more liquid assets for a period of time.

Repo transactions are often low risk since, in the event of default, the counterparty already owns the collateral to the transaction, which is normally close to 100% of the value of their asset (as there may be some movement due to intraday fluctuations between margin calls).

The European Commission does not attempt to estimate the economic impact of taxing repos, despite widespread concern about the potential impacts, including from central banks. Oxera show in this section that it is possible to provide indicative estimates for one of the more tangible elements of the potential impact, which finds an economic loss from deterring the use of repos that is much larger than the revenue that is likely to be collected from those repos that continue under the tax. In addition to this cost, other, less tangible, costs arise from the damage that the loss of repo activity could cause to the efficient functioning of the financial system.

Section 6: Key findings

– Like other commentators (including the European Commission), Oxera finds that short-term repos will be severely affected by the FTT and many will become uneconomic. However, Oxera finds little evidence to support the Commission's belief that repos can be easily replaced with secured lending.

– Financial institutions will be affected both by the cost of the tax and because they will need to hold more cash due to being less able to use repos.

– Consequently, there is a substantial cost to the economy through higher costs for financial institutions. Based on relatively transparent assumptions and publicly available data, Oxera provides an indicative annual/one-off cost estimate, equal to €11.5 billion per annum overall, of which €9.2 billion per annum would be a deadweight loss.

– There is also likely to be significant additional stability and risk concerns from taxing repos.

Source: Oxera.

6.1 Potential impact of the FTT

With the FTT, the Commission's impact assessment assumes that all repos are replaced by secured lending and that this change has no additional cost. However, there is likely to be a cost to this because collateralised lending is a more risky process, as discussed below. Oxera therefore considered a more nuanced and realistic process given the FTT.

Calculation of the annual cost of the FTT on different maturities of repos (eg, an overnight repo position that would have to be re-hedged every day) provides a route to establish the

potential revenue and flight from the market, as well as to estimate the costs from the lack of repo use.

Oxera estimated the additional return that a bank (or other financial institution) can achieve by holding longer-dated assets rather than a series of similar shorter-dated assets to be 0.8 percentage points.[110] This is assumed to be the loss suffered by a financial institution if it held cash, rather than longer-dated government bonds. As repos are used as a way to access liquidity (when holding longer-dated assets), Oxera therefore assumed that if the tax cost exceeded 0.8% p.a. at a certain maturity, the market in that repo maturity would no longer exist since this would be untenable in the face of alternatively holding cash or other liquid securities. With a tax rate of 0.2% for a complete repo cycle, the advantage of holding long dated securities combined with repo transactions to achieve the required liquidity will be uneconomic if it requires four or more repo transactions per year. This suggests that repos with maturities of less than 3 months will become uneconomic. (To the extent that there are other net transaction costs associated with using repos in this way, the maturity length of repos that become uneconomic increases.[111])

Oxera's assumptions for the proportion of the repo market that remains were combined with estimates of the market sizes, as summarised in Table 6.1.

Table 6.1 Proportion of the repo market that remains with the tax (based on 2012 data)

	% of market (by outstanding value)	Assumed % remaining with FTT	Transaction value of repos that are taxed (€ billion per annum)[1]	Tax revenue (€m)	Short-term assets held due to loss of repos (€ billion)
1 day	16%	0%	0	0	285
2 days to 1 week	16%	0%	0	0	285
1 week to 1 month	16%	0%	0	0	285
1 to 3 months	16%	25%	428	856	214
3 to 6 months	4%	75%	143	285	18
6 to 12 months	3%	90%	64	128	5
More than a year	13%	95%	147	294	12
Forward-start	10%	75%	267	535	45
Open	6%	95%	68	135	5
	100%	**35%**	**1,116**	**2,233**	**1,154**

Note: [1] The calculation takes account of the fact that shorter term repos have a higher turnover than longer term repos—for example, assuming a 3 month repo is turned over four times per year. This value is based on the International Capital Market Association (ICMA) estimate of outstanding repos in the EU of €3.2 trillion (2012), adjusted downwards to obtain an FTT-zone estimate based on proportion of GDP (55%).
Source: Oxera calculations, using Bank of America Merrill Lynch data.

This analysis suggests that, with the FTT in place, at most only 35% of repo value would continue and, because it is the short maturity repos that have disappeared, less than 1% of

[110] The average difference between the yield on ten-year UK gilts and the official base rate (and also one-month interbank rates) over 1993–2012 was 0.8 percentage points. Source: Bank of England statistics.
[111] For example, the ICMA estimate that all repos of less than 1 year duration become uneconomic: See ICMA (2013), 'The impact of the Financial Transaction Tax on the European repo market', April, page 3

repo transactions remain. Oxera therefore reached a volume conclusion (a loss of 65% of outstanding value) similar to the minimum ICMA estimation (a loss of 66%).[112]

For those repo transactions that continue to occur, the FTT revenue will be equal to 0.2% of the value of the transactions, as the FTT will be applied to (both sides) of the initial transaction only, not to the return of the collateral. Based on the latest estimate for the size of the repo market in the EU, adjusted downwards using relative GDP weights, this suggests that the FTT revenue from taxing repos will be €2.2 billion per annum. These calculations are shown in Table 6.1 above.

Table 6.1 also estimates the amount of shorter-dated assets held instead of longer-dated assets due to the impact of the loss of repos. This estimates a total of €1.15 trillion held as shorter-dated assets, which when multiplied by 0.8 percentage points (the assumed loss of return) gives a deadweight loss of €9.2 billion per annum. These impacts are summarised in Table 6.2.

The impact on the illustrative utility banks was also calculated, based on the repos reported in their annual accounts (using the same methodology as for derivatives). These found a relatively small impact, also reported in Table 6.2.

Table 6.2 Impacts from the repo market

	Impact
Tax burden (€ billion per annum)	2.2
of which utility banks (€ billion per annum)	0.1
Deadweight loss (€ billion per annum)	9.2
of which utility banks (€ billion per annum)	0.5
% rise in lending rates of utility banks	**0.013%**
from tax burden (%)	0.002%
from deadweight loss (%)	0.012%

Source: Oxera calculations, using bank annual reports and ICMA data.

The taxing of the repo market increases the FTT revenue estimated by the Commission by approximately €2.2 billion per annum, but at the cost of an additional negative impact on the economy of €9.2 billion per annum.

Oxera maintains that the burden of the tax will be borne by consumers. As stated in Oxera (2011):

> The taxing of repos therefore represents another step in reducing the efficiency of financial intermediation, increasing the costs of transferring funds from savers to investors. The cost of the tax (either as tax paid, or by forcing participants to use more costly alternatives) can therefore, as before, be expected to fall on companies and governments, in the form of higher costs of funding (including bank lending, which is not directly taxed), and on savers, in the form of lower rates of return.

Similarly, ICMA states:

> For financial institutions at the either end of a chain, the cost would be their own FTT payment plus a share of the costs of the intermediaries. For example, in a chain of three GC repos against core eurozone collateral, the financial institutions at either end would each be liable to pay the FTT (EUR 1,000 per EUR 16 million of collateral) plus a share

[112] See ICMA (2013), 'The impact of the Financial Transaction Tax on the European repo market', April, available from: http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/short-term-markets/Repo-Markets/icma-european-repo-market-reports-and-white-papers/the-impact-of-the-financial-transaction-tax-on-the-european-repo-market/

of the costs of the two intermediaries between them, ie a share of EUR 4,000 per EUR million of collateral[113]

With this in mind, and recalling the 100% tax pass-through assumptions concerning financial institutions set out in section 2, Oxera would expect consumers to bear almost 100% of the burden through costs to their pensions, insurance, investments and banking (as the repo market is dominated by financial institutions that offer these services). However, this is not the only cost of repos. The disappearance of the shorter-term market has consequences for stability (as discussed in section 9) and a cost to those who would otherwise use the market. Oxera does not find evidence to support the Commission's premise that repos would be seamlessly replaced by secured lending without the legal ownership transfer, noting the aforementioned ICMA report and the argument that legal ownership brings a large amount of benefits, such as re-hypothecation (the further passing on of ownership to diversify risk) and the ability to use assets for purposes such as collateral pledging.

[113] ICMA (2013),'Collateral Damage – the impact of the FTT on the European repo market', April, p. 15.

7 Relocation of financial trading activity

The financial services sector is one of the main ones included in national accounts for estimating total economic output, as measured by GDP. The sector is broad, covering retail and wholesale banking, insurance, payments systems and other sub-sectors. The conducting of financial transactions forms part of the activities of many of these sub-sectors, and therefore any reduction in financial trading could have an impact on economic output.

Financial trading is, however, an intermediary service, not a final product of the economy. A home owner might benefit from a fixed-interest mortgage product (the final product), the production of which involved the trading of derivatives (an intermediary product). The impact of the tax here is to raise the cost of producing the final product, and this impact is captured in the analysis described above (for example, by estimating the cost of the derivatives tax on banks and hence on banking customers).

The loss of financial trading activity could, however, affect economic output more directly if the activity relocates to other countries to avoid the tax. The intermediary service of financial trading would then become an import. This potential economic impact is assessed in this section.

Section 7: Key findings

– Empirical analysis suggests that, when deciding where to locate, financial services companies are relatively sensitive to taxation.

– With regard to the FTT, most commentators (including the Commission) expect that derivatives trading will be the most mobile of all trading and therefore the most likely to relocate.

– To explore the potential macroeconomic impact, Oxera assumes that Germany loses €2 billion per annum of net exports due to the relocation of derivatives trading, and other FTT-zone countries lose a similar proportion of their FS sectors.

Source: Oxera.

7.1 Financial trading as an intermediary service

A significant reduction in the number of financial transactions can be expected to result in the loss of financial trading jobs. As financial traders are typically high earners, this loss could result in reduced spending by traders on other goods and services, suggesting a wider economic impact.

By itself, losing financial trading jobs does not necessarily imply any wider economic impact, as trading is an intermediary good. A reduction in the production of intermediary goods can be seen to represent an improvement in the efficiency of producing the final output, and one would typically expect to see resources reallocated within the economy. An example of this is provided by the impact of the Internet on the efficiency of business-to-business supply chains. The Internet significantly improved the efficiency of many supply chains, which would have necessarily resulted in job losses from intermediary services that were replaced by more efficient Internet communications. Business-to-business letter post could be another such example, being replaced by email.

However, a reduction in trading activity could result in some regions being negatively affected (where trading activity ends) and other regions benefiting (particularly if activity shifts to those regions). The extent of this impact would be determined by the extent of relocation of trading activity.

7.2 Relocation of trading activity

Financial trading activity, especially derivatives trading, tends to be concentrated in particular financial centres. While, in principle, derivatives trading could be conducted anywhere, derivatives traders in the EU are concentrated in Germany and the UK, with other major centres of trading including the USA and Japan.

The ability and willingness of financial companies to trade in locations depend on the characteristics of the counterparties and the traded instruments. For example, dealers and hedge funds are likely to be flexible in moving operations and trading to other countries, whereas pension funds and insurers are tied to the countries and structures they currently work from.

The evidence on relocation suggests that the FTT could trigger significant relocation of financial services activity, particularly for derivatives trading.

7.2.1 Sensitivity of companies' location decisions to taxes

In a study for the European Commission, Copenhagen Economics made a number of evidence-based observations about the sensitivity (elasticity[114]) of the location decisions of financial companies to taxes:[115]

– financial companies are very responsive to taxes, and more so than non-financial companies;

– responsiveness to taxes is non-linear over time, varies across countries, and does not depend on agglomeration effects.

Copenhagen Economics analysed how financial companies' location decisions were affected by taxes, typically by estimating the elasticity of FDI to taxes. It found elasticity estimates in the range of –1.8 to –6.6 for the financial sector, and –0.8 to –2.3 for the broader tertiary sector (other non-financial sectors).[116] These estimates confirm that financial companies are highly responsive to taxes, and to a greater degree than other companies in the tertiary sector.

The high elasticity estimates can be explained by the sensitivity of financial companies' business models to transaction costs, and by their flexibility to move capital, trading and traders across countries. Overesch and Wamser (2008) confirm the high responsiveness of providers of financial services to taxes, finding tax-rate elasticity estimates that are at least twice as high for financial companies than other companies in the tertiary sector. They argue that the main explanation is the mobility of profits.[117]

7.2.2 Empirical evidence: portability

Oliver Wyman estimated the proportions of differing types of transaction that can be moved to locations outside the EU (the 'portability of foreign exchange transactions'), as follows:

– 60–80% for transactions involving an EU dealer;

– 70% for dealer to hedge fund transactions;

[114] Elasticities are defined as the percentage change in one variable due to a percentage change in another variable.

[115] Copenhagen Economics (2012), 'Tax elasticities of financial instruments, profits and remuneration', review of the economic literature commissioned by DG Taxation, September.

[116] An elasticity of –6.6 can be interpreted as a 1% increase in tax triggering a –6.6% decrease in FDI.

[117] Overesch, M. and Wamser, G. (2008), 'Who Cares about Corporate Taxation? Asymmetric Tax Effects on Outbound FDI', *IFO working paper*, April

– 30–35% for dealer to corporate transactions.[118]

Although these results cannot be directly relied on for estimating the magnitude of relocation, they provide an upper bound of the potential magnitude of relocation. Note that the Oliver Wyman study estimates were in the context of an EU-wide FTT. If considering a smaller geographical scope of the FTT, estimates are likely to be higher since a smaller scope would increase the opportunities for tax evasion.

7.2.3 The Swedish experience

Both Sweden and the UK have levied taxes on financial transactions in the recent past. These precedents provide an indication of what might happen following the introduction of the FTT in the 11 Member States. The precedents confirm that a transaction tax can have a material impact on trading volumes and relocation, but also flag that the magnitude of the impact will depend critically on factors specific to the case, such as the tax base and instruments covered by the tax. The rationale here is that these factors frame the opportunities for and costs of tax evasion, on which the response of market participants, and hence the impact of a tax, will depend.

In Sweden, the opportunities for evading tax turned out to be great. This triggered financial companies to make significant changes in trading volumes and location—more particularly:

– 60% of trading volume of the 11 most actively traded Swedish share classes moved to the UK;

– 50% of all Swedish share classes moved to the UK;

– foreign investors moved trading outside Sweden, while domestic investors reduced the number of equity trades. [119]

These figures exemplify that if the costs of tax avoidance are low (and opportunities are ample), the introduction of a transaction tax can have a significant impact. Most strikingly, trading in derivatives in Sweden in effect ceased to exist.

In contrast, for many years, the UK has been levying a transaction tax in the form of a stamp duty, a tax on share transactions in UK incorporated companies of 0.5% of the purchase price of shares. The impact of the stamp duty appears to have been of a smaller magnitude than the Swedish transaction tax, which can be explained by the more limited opportunities for (and thus higher costs of) tax avoidance in this case—basically anyone wanting to trade in UK equities had to pay the tax. [120]

7.3 Macroeconomic impact

Payments by end-users in other countries for traders' services can be seen as a form of import of services from the relevant financial centres. If all the traders in the City of London moved to Geneva, there would be a large impact on the net exports of financial services from the UK (with an opposite change for Switzerland). Therefore any significant shift in derivatives traders from one country to another is likely to result in changes in net exports. This 'demand shock' will have macroeconomic consequences in the short run, but also potentially in the long run if the traders' activities are particularly high-value exports relative to

[118] Oliver Wyman (2012), 'Proposed EU Commission Financial Transaction Tax Impact Analysis on Foreign Exchange Markets', study commissioned by GFMA.
[119] Umlauf, S. (1993), 'Transaction Taxes and the Behavior of the Swedish Stock Market', *Journal of Financial Economics*, **33**, pp. 227–40.
[120] Oxera (2007), 'Stamp Duty: Its Impact and the Benefits of Its Abolition', prepared for ABI, City of London Corporation, IMA and London Stock Exchange.

the resource (primary labour) required. This is probably the case given the high earnings of traders.

The analysis above envisages significant reductions in the trading of bonds and derivatives in the EU markets, but less reduction in equity trading. Most of the impact on bond trading will be with reference to sovereign debt, and sovereign debt trading is thought to be less likely to relocate.[121] The focus of the net export analysis is therefore on derivatives trading.

7.3.1 Estimating a net export shock for derivatives trading

Information about financial services exports is limited, certainly in comparison with manufactured goods. Typically, data exists only at the highest aggregate level for the sector (eg, total financial services exports). Data available for Germany, for example, suggests that total financial services exports and imports were €14.7 billion and €9.5 billion in 2011.[122] Much of this trade will have been in retail and commercial financial services, rather than derivatives trading.

Perhaps more useful is data from annual reports. Deutsche Börse reports that around half of its revenue comes from derivatives trading (primarily on Eurex).[123] This could imply that half of the approximate €1 billion per annum of Deutsche Bourse profits and wages could be associated with derivatives trading. Assuming that there is a similar level of economic activity in other parts of the value chain—notably among clearing members of Eurex—this suggests that derivatives trading in Germany could produce profits and wages of around €1 billion per annum.

In addition, a similar value might be associated with the activities of derivative traders, among financial institutions (eg, banks) and also larger non-financial corporates with trading desks. On this basis, an additional €1 billion per annum is assumed for these activities in Germany. This suggests **a loss of financial services activity for Germany of €2 billion per annum**.

A similar assumption is adopted for France (adjusted by GDP), as Oxera understands that French banks are particularly active in derivatives markets. For the other FTT-zone countries, where derivatives trading is assumed to be less important, one-half (adjusted by GDP) has been assumed.

The total sum of these impacts for the FTT-zone is €5 billion per annum, which is a relatively small impact compared with combined GDP of some €8.6 trillion per annum.

7.3.2 Impact on UK net exports?

The impact on UK trading is uncertain. There are various reasons for concluding that the level of activity in the UK could be largely unaffected, increased, or decreased by the introduction of the tax in the FTT-zone, as discussed below.

Reasons to suspect little change in trading in the UK

Estimates in this report (see section 3) suggest that investors from FTT-zone countries hold around 10–15% of UK taxable securities. While this is a significant level of investment, it also shows that the UK is not wholly reliant on investors from the FTT-zone. This may suggest that the impact of the tax on FTT-zone investors will have a rather muted impact on the UK. This is the finding of the analysis on the cost of equity and the cost of debt, discussed in section 3.

[121] Sovereign debt trading mainly takes place on electronic trading platforms such as MTS and Tradeweb. These link financial institutions trading the government debt of a specific country. There remains a strong local bias for government debt holdings, so many of the institutions holding a country's debt will be resident in that country.

[122] Source: Federal Statistical Office of Germany.

[123] As estimated from the 2011/12 annual report of Deutsche Borse.

Furthermore, a significant shift of derivatives trading activity out of the FTT-zone may not benefit the UK much overall if it is accompanied by a reduction in the use of derivatives by EU corporates. These offsetting trends could result in little overall impact on trading in the UK.

Reasons to suspect an increase in trading in the UK

At first sight, the FTT could be seen to benefit trading activity in the UK, as it is one of the closest trading centres to the FTT-zone. The UK benefited from the Swedish FTT, for example, as trading shifted from Sweden to the UK.

The focus of the Commission on avoiding this outcome might suggest, however, that relocation elsewhere, outside of the EU, may be more likely.

Reasons to suspect a decrease in trading in the UK

The UK is the principal centre for financial trading activity in Europe, and therefore a tax that is likely lead to significant reductions in the demand for financial trading in Europe is likely to have an adverse effect on the UK to some extent.

However, financial trading is typically a global activity, not an EU-specific activity, and the extent to which the FTT affects global trading levels is uncertain.

Overall, therefore, it may be best to assume little impact on UK financial trading activity, for the purposes of assessing the macroeconomic impact.

8 Financial stability

One of the stated aims of the proposed FTT is to improve financial stability. Oxera has reviewed the relevant material on this, including from the Commission, and concluded that there is little evidence to expect that the FTT would benefit financial stability. Instead, there are reasons to be concerned about specific impacts of the FTT, which could actually be detrimental to financial stability.

This section first explains the arguments put forward by the Commission, before discussing some high-level principles regarding financial stability and then focusing on specific areas where the FTT could reduce stability, rather than improve it.

Section 8: Key findings

- The FTT does not address issues of systemic risk and there is little evidence that the activities hit hard by the FTT contributed significantly to the causes of the financial crisis.
- Many commentators, including central banks, have voiced concerns about the impact of the FTT on the repo market, which is seen to play an important role in accessing liquidity and the operation of monetary policy.
- The FTT may deter some risk management procedures and therefore add to risk in the economy.
- Overall, there is little evidence to suggest that the FTT will improve financial stability, and there are some specific concerns about its impact on the functioning of the financial system and risk management.

Source: Oxera.

8.1 The Commission's position

In 2011, the European Commission evaluated its initial proposal (among other objectives, discussed in section 10) as a first step in order to: [124]

> create appropriate disincentives for transactions that do not enhance the efficiency [and stability] of financial markets thereby complementing regulatory measures aimed at avoiding future crises.

More generally, the proposal was presented as targeting the long-term financial stability objective of the Commission by disincentivising 'overly risky' transactions, activities and behaviour in some segments of financial markets and complementing the EU financial regulatory framework. The Commission expects that the tax-neutrality feature of the proposal will hit harder the activities and transactions that are identified as excessively risky or not contributing to the efficient and stable functioning of financial markets, such as high-frequency trading and highly leveraged derivatives.

The Commission advocated a coordinated approach to taxing those transactions at both the EU and international level. In support of this, it noted that the empirical evidence suggested that taxing financial transactions at the national level could result in delocalisation of activities and institutions, and other distortions. The Commission cited Sweden as a case in point.

[124] European Commission (2011), 'Proposal for a Council Decision authorising enhanced cooperation in the area of financial transaction tax', COM(2012) 631 final/2, p. 2.

In order to reflect the reduced scope of the tax, from global to regional level, while maintaining the same financial stability objective, the initial proposal was modified, including through the addition of (elements of) the 'issuance principle' to the 'residence principle' for taxation. This was in turn seen as a way of strengthening the anti-relocation feature of the common taxation system.[125]

The Commission considered other concerns raised by some Member States since the initial proposal, including the exemptions of market participants, namely market-makers, broker-dealers and prop traders, whose activities are arguably conducive to the efficiency of financial markets.[126] It rejected the claim that not exempting these financial institutions would impair the functioning of financial markets, by reducing their efficiency and liquidity. Moreover, it pointed out that new financial regulations were already seeking to limit activities, such as high-frequency and proprietary trading, and to de-leverage derivatives markets. In that sense, taxing those players was seen as a complement of the new and forthcoming regulatory framework. However, the Commission seemed to put a larger weight on the aim of achieving tax neutrality across market participants and products, and the negative implications for tax revenues and the objective of 'ensuring a fair and substantial contribution from the financial sector for covering the costs of the crisis', rather than on the potential positive implications for the functioning of the financial system.

The Commission also decided against tax exemption for repos, which are arguably important instruments for the functioning of money markets, liquidity management and collateral trading, and for derivatives, which are often used for risk management purposes.[127] It concluded that not taxing repos would privilege them over similar activities such as securities lending and similar transactions in the spot and forward market for securities, which are both taxed, and at the same time repos can be easily substituted by secured loans or central bank repos, which are both unaffected by the FTT.

As for derivatives, it concluded that not taxing these would harm tax neutrality, cause a substantial loss to targeted tax revenues and stimulate growth of tax-avoiding business models at the expense of the market for the underlying securities. At the same time, taxing derivatives, rather than impairing the risk management capacity of non-financial and financial sectors, is assumed to simply reduce the volume and frequency of speculation (ie, trading of derivatives) and of economically insignificant and/or excessive risk-hedging activities.

8.2 High-level considerations

Oxera began its appraisal of the potential impact of the FTT on financial stability by considering some high-level principles for whether there is likely to be an impact.

8.2.1 Systemic risk, speculative and 'risky' activities

It could be argued that, in order for the FTT to support regulation with avoiding future crises, the FTT should help to reduce (the build-up of) systemic risk. Core sources of systemic instability are excessive risk-taking and the interconnectedness of banks, and the existence of government guarantees, such as deposit insurance and implicit government support to the too-big-too-fail institutions; and the risk of fire sales under stress conditions amplify systemic risk.

Anthony et al. (2012) argue that the FTT is not well targeted at behaviour that leads to excessive risk and systemic risk creation. Indeed, while the tax neutrality will hit harder some transactions the Commission is concerned about, it will also hit a number of other activities supporting the functioning of stable financial markets (see below). Anthony et al. (2012) also

[125] European Commission (2012), op. cit., p. 51.
[126] European Commission (2012), op. cit., section 6.3.
[127] European Commission (2012), op. cit., section 6.2.

note that the tax does not address issues such as government guarantees, nor does it prevents fire sales.

Moreover, there is a lack of evidence that the trading activities stigmatised by the Commission (and by the European Parliament in their June 2013 discussion of the proposals) contribute to systemic instability. For example, one of the declared objectives of the proposal is to curb high-frequency trading. However, Linton and O'Hara's 2011 review of the literature on the impact of computer trading on liquidity, price efficiency and discovery, and transaction costs, concluded that, while it can be linked to periodic illiquidity, computer trading brought many benefits to financial markets, including enhanced liquidity, lower transaction costs and possibly higher market efficiency. On these grounds, it seems warranted to have a more targeted approach to high-frequency trading that seeks to address the underlying causes of concern, rather than broader measures that would disincentives the overall activity. AFME (the Association for Financial Markets in Europe) supports this approach.[128]

8.2.2 Implication of a narrower geographic scope of FTT

As noted before, the Commission's initial proposal advocated international cooperation over the implementation of the tax to address the risk of relocation and its negative implications. Andersson and Fall (2012) noted that shifting transaction volumes outside of the EU would be likely to increase, rather than reduce, volatility. The example of Sweden, which introduced a security transaction tax levied on transactions executed on domestic exchanges, following a residence principle, is a case in point.

8.3 Analysis of specific issues related to financial stability

8.3.1 Impact on the repo market

As described in section 6, there are reasons to expect that the short-term repo market will become uneconomic, up to at least the first six months after the introduction of the FTT, and therefore be effectively taxed out of existence by the FTT.[129] The ICMA argues that it is not feasible for secured loans to replace repos, as envisaged by the Commission, as these forms of loan do not provide the same legal protection in default. Moreover, it is unlikely that central banks will accept taking the place of the money market. Consistent with this last point, the Bundesbank warned against the monetary policy implications of such substitution.[130]

The Commission has not analysed the implications of severely damaging the market for short-term repos, and there is a clear need to do so, especially given comments from central banks.

8.3.2 Operational risk

The ICMA also warns that an efficient short-term repo and securities lending market, both of which will be affected by the FTT, are essential means of smoothing settlement and prevent delivery failures. The loss of those markets, it concludes, would increase systemic operational risk.[131]

8.3.3 Market volatility and asset bubbles

In 2011, the Commission noted that 'an extensive review of the economic literature overall concludes that the effects of the FTT on volatility is largely inconclusive and depends on market structure'. The Commission's own impact assessment found a rather marginal positive impact of the FTT[132] on the volatility of the share price and of real economic

[128] See AFME (2011), 'Briefing note on a financial transaction tax', October.

[129] See ICMA (2013), op. cit.

[130] Speech by Dr Jens Weidmann, President of the Deutsche Bundesbank, at the Deutscher Sparkassentag in April 2013, available at http://www.bundesbank.de/Redaktion/EN/Reden/2013/2013_04_24_weidmann_sparkassentag.html.

[131] See ICMA (2013), op cit, p. 28.

[132] The model does not embed a derivatives market.

aggregates.[133] Moreover, the model used in the assessment did not capture the effect of tax-induced falling market liquidity on share price volatility. As transactions usually cause larger price fluctuations in less liquid markets, the volatility gains of a financial transaction tax could be even smaller, if not negligible or even negative.

The impact assessment did not, however, shed light on the possible link between short-term risky trading and long-run asset mispricing—ie, asset bubbles. Moreover, the Commission noted that:

> the instruments which led to the 2008 financial crisis do not belong to the set of frequently traded instruments. Moreover, asset bubbles have historically also occurred in markets with high transaction costs (real estate), suggesting that a low-rate STT will not prevent them in the future.

The findings of Lensberg, Schenk-Hoppé and Ladley (2012) are consistent with this view. The authors used a model, calibrated on US data and integrating short-term trading activity with long-term asset management, to measure the impact of different regulatory scenarios, including the introduction of a 0.1% transaction tax on equity and debt. They found that, while the tax has a negative impact on liquidity and price discovery, it has no significant effect on long swings in asset prices, measured as peak-to-trough declines.

8.3.4 Risk management and risk appetite

The proposed FTT would create disincentives for risk management procedures, such as currency hedging. Both financial and non-financial corporations purchase derivatives to act as a form of insurance against unforeseen events, such as unexpected changes in currency rates, interest rates, prices, counterparty risk or security values. Often these insurance-providing derivatives are highly leveraged in nature, as the corporate wishes to protect itself from unlikely events only, and therefore the impact of the tax on the cost of the hedge is proportionally large.

The use of derivatives for hedging has increased markedly among non-financial corporations over the past few decades owing to the reduction in the cost of hedging and the increasing sophistication of corporate treasuries. Such risk management procedures help to encourage companies to export their goods and services, as they no longer need to price in uncertain risk margins for uncertainty in their cash flows.

Oxera (2011) noted that, while the cost of the tax for an individual derivative appears relatively low, as the rate of tax is proposed at 0.01% for each side of the transaction, owing to frequent renewing of contracts and many different types of derivative being used, the overall cost of the tax for corporate treasuries can become significant enough if not to deter risk management, at least to encourage tax avoidance via relocation of hedging activities outside the EU. The BBA (British Bankers Association) also raised a related concern: investors and companies could simplify their hedging strategies to avoid the cascading nature of the tax, which in turn would reduce the effectiveness of the risk mitigation produced by those strategies.

A reduction in the effectiveness of hedging could couple with a potential increase in risk appetite, driven by the tax neutrality of the proposal, resulting in a more vulnerable and unstable financial system. De Nederlandsche Bank suggests that market participants could indeed pursue riskier trading strategies to protect their margins offsetting the impact of the tax.[134]

[133] European Commission (2011), op. cit., Annex 15, p. 40.

[134] De Nederlandsche Bank (2012), 'Financial transaction tax in EU is undesirable', February 6th, *DNB Bulletin*, http://www.dnb.nl/en/news/news-and-archive/dnbulletin-2012/dnb267803.jsp

In summary, there is a lack of evidence that the FTT would significantly improve financial stability, while, in a number of other specific areas, the FTT may actually damage financial stability. The Commission has not properly examined this important issue.

9 Impact on public finances

The primary focus of this report is the potential impact of the FTT on the wider economy. The analysis set out above examines the main channels through which the FTT can affect the public finances. Oxera used these impacts to estimate the overall impact on the wider economy and hence public finances by teaming up with macroeconomic modelling experts at Oxford Economics, the leading independent macroeconomic modelling and forecasting organisation.

This section sets out the macroeconomic model used, together with the inputs into and outputs from the model. It also summarises the impact on public finances.

Section 9: Key findings

- The Oxford Economics macroeconomic model was used to assess the impact of the FTT on the wider economy based on the Oxera analysis described in this report.
- The FTT is found to have a relatively severe impact on the public finances of the FTT-zone countries, as summarised in the table below.
- The results from the modelling suggest that FTT revenues will be lower than the Commission expects, primarily due to lower levels of bond trading. Most of those revenues are offset by reductions in other tax revenues due to the economic impact. Just as important, however, are the increased costs for funding government debt.
- The long-term net effect on public finances as a result of the impact of the FTT is estimated to be a loss of €4 billion per annum. The negative impact on public finances is estimated to be more severe for more heavily-indebted countries, such as Italy.
- Unless there are further increases in other tax rates or increased borrowing, this analysis suggests that some countries may need to cut public spending further if they are to introduce the FTT, as summarised in the table below.

Table 9.1 Estimated impact on public finances (€ billion per annum)

	FTT revenue	Loss of other revenues	Increased cost of funding government debt	Net impact on public finances
France	12	2	7	**+2**
Germany	16	5	9	**+2**
Italy	9	6	8	**–5**
FTT-zone	**51**	**22**	**33**	**–4**

Source: Oxera and Oxford Economics analysis, drawing on Eurostat data for government debt and GDP.

9.1 Macroeconomic model

Oxford Economics' Global Economic Model provides advanced decision support that can be used to address strategic questions relating to a wide range of economic topics, such as the impact on global growth of oil price spikes, the economic and financial fallout of countries leaving the eurozone, and how a decline in China's growth would affect the global economy. The model provides Oxford Economics' base scenario along with various alternatives to support a tailored analysis, such as the potential impact of the FTT.

In the Global Economic Model, individual country models are fully linked through global assumptions about trade, exchange rates, competitiveness, capital markets, interest rates,

commodity prices and internationally traded goods and services. The model allows the findings on economic impact described above to be incorporated in the modelling, to understand the outcomes for specific countries and wider economic regions.

This model provides clear advantages over the more theoretical model used by the Commission in its impact assessment. The Oxford Economics Global Economic Model is more precisely calibrated to current conditions in the global economy and is used for both short- and long-term forecasting purposes. As such, it has a much firmer grounding in reality, being continually tested and revised against actual outturns, than the purely theoretical approach.

Using the Global Economic Model also provides an entirely independent assessment of the macroeconomic impact, adding to the understanding of what the impact of the FTT may be.

9.2 Inputs into the macroeconomic model

The inputs into the macroeconomic model were all derived from the analysis set out above. Table 9.2 sets out the input assumptions and provides references to the sections of the report that explain how they were derived.

Table 9.2 Input assumptions for the macroeconomic model

Component		Impact
Cost of equity	FTT-zone	+0.4%
	UK	+0.015%
Cost of government debt	FTT-zone	+0.4%
	UK	+0.01%
Cost of corporate debt	FTT-zone	+0.2%
Total bank lending rate rise	FTT-zone	+0.225%
Corporate cost shock	FTT-zone	€7.9 billion per annum
FS relocation	FTT-zone	€4.3 billion per annum
Repo cost shock to FS	FTT-zone	€8.7 billion per annum

Source: Oxera calculations.

The corporate cost shock was spread between the 11 Member States in line with their share of the GDP of the total.

9.3 Outputs from the macroeconomic model

The raw outputs of the model are summarised in Table 9.3. These are estimates for the long-term impact on the selected economies.

Table 9.3 Raw outputs of Oxford Economics Global Economic Model: impact of FTT

Component	France	Germany	Italy	FT–11
GDP (%)	–0.5	–0.5	–0.7	–0.6
Investment (%)	–1.2	–1.2	–1.7	–1.4
Employment (%)	–0.0	–0.1	–0.0	–0.1
Wages (%)	–0.4	–0.4	–0.7	–0.5
CPI (%)	0	0	0	0
Tax revenue loss (€ billion per annum)	2.3	5.3	6.3	21.8

Source: Oxford Economics.

To put these results into perspective, the Commission's estimate of the FTT revenues of €34 billion per annum represents 0.39% of GDP. This would be significantly less than the long term economic impact assessed by Oxford Economics.

9.4 Summary of the impact on public finances

The impact on public finances is equal to the FTT revenue minus the loss of other tax revenues minus the increased cost of servicing debt. The final results of this calculation are presented in Table 9.1 above.

The calculations are explained below.

9.4.1 FTT revenues

FTT revenues are found to be higher than expected by the Commission, primarily due to considerably higher estimates of the burden of the tax on bond trading, as well as the inclusion of repos.

Oxera's assumptions of bond turnover falling to one (ie, on average, each bond is traded once per year, compared with the current turnover of around three), with the FTT in place, suggests that the total annual value of transactions liable for the tax will be equal to the outstanding value of FTT-zone bonds (approximately €8 trillion),[135] which suggests FTT revenue from taxing government bonds equal to some €16 billion per annum.

Revenues from corporate bonds are likely to be lower, as outstanding amounts of corporate debt are lower[136] and the turnover rate is lower, which would produces lower FTT revenues. Based on the simplifying assumption of a turnover rate of 0.5 for corporate bonds given the FTT,[137] this would suggest revenue of some €6.5 billion from corporate debt. Total FTT revenues from taxing bond transactions are therefore estimated to be €22.8 billion.

The Commission did not include any revenues from repos, whereas Oxera estimates revenue of €2.2 billion per annum.

Table 9.4 compares the findings on FTT revenues.

[135] Eurostat data for government debt levels in 2012. Available at: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data/main_tables

[136] See section 3.2.2, which estimates corporate debt levels of €6.5 billion.

[137] Equal to a half of the assumption of a turnover rate of one for sovereign debt, given the FTT.

Table 9.4 FTT revenue estimates (€ billion per annum)

Component	Oxera estimate	Commission estimate
Securities	**27.4**	**13.0**
shares	4.6	4.6
bonds	22.8	8.4
Derivatives	**21.0**	**21.0**
Repos	**2.2**	**Nil**
Total	**50.6**	**34.0**

Source: Oxera calculations.

9.4.2 Loss of other tax revenues

Loss of other tax revenues was one of the raw outputs from the Oxford Economics model, as described in section 9.3.

9.4.3 Increased cost of funding government debt

The increase in the cost of funding government debt was calculated as the increase in the cost of debt (0.4 percentage points) times the gross outstanding debt of each country, using Eurostat data for 2012.[138] These are estimated in Table 9.5 for all of the FTT-zone countries.

Table 9.5 Impact on the cost of funding government debt (€ billion per annum)

Country	Gross government debt (€ billion, 2012)	Increase in funding costs (€ billion per annum)
Austria	227	0.9
Belgium	375	1.5
Estonia	1.7	0.007
France	1,834	7.3
Germany	2,166	8.7
Greece	304	1.2
Italy	1,989	8.0
Portugal	204	0.8
Slovakia	103	0.4
Slovenia	37	0.15
Spain	884	3.5
Total	**8,126**	**32.5**

Source: Eurostat data and Oxera calculations.

9.5 Implications of conservative assumptions

In a number of areas Oxera has taken a relatively conservative assumption of the impact of the FTT on the remaining taxable activity. There are a number of implications of this approach that should be taken into account when interpreting the impact on the wider economy set out above. If transactions fall more than estimated then the FTT tax revenues fall. This will be mirrored by a reduction in the tax payment by end users, so the negative impact on the wider economy from this *direct* increase in costs would fall. There would, therefore, be less impact on the tax revenues from other taxes, if this was the only effect.

[138] Available from: http://epp.eurostat.ec.europa.eu/portal/page/portal/government_finance_statistics/data/main_tables.

However, in addition to these direct effects, there are two other effects, both of which are negative.

– if the activity that stops in the FTT zone just moves out of the FTT zone, but can still service FTT zone customers, then imports increase for FTT zone countries: and/or

– if the activity that stops is not available as an import, the economic value of those transactions is lost, potentially all of it, if there are no substitutes available.

In extremis, where an activity is stopped, and is not substituted by imports, all that happens is that FTT zone economy is less efficient. There is no FTT revenue, but there is depression of other tax revenues. Public finances deteriorate, and overall economic activity in the economy is depressed.

The fact that the extreme scenario, where no FTT tax is paid, still results in an outcome bad for the economy and bad for public finances, suggest that had Oxera taken a more extreme view on the reduction in tax able transactions the outcome would not improve but, if anything, get worse. As a result, the analysis of the wider implications is likely to be, if anything, an underestimation of the net negative impact of he FTT on the FTT-zone countries.

10 Evaluation of the Commission's objectives

This report has highlighted that it is likely that the Commission has underestimated the negative economic consequences of the proposed FTT. In particular, there is a significant risk that the FTT would actually worsen public finances, suggesting that it is an inefficient form of taxation. In addition, the tax would appear to provide little support to improving financial stability, and in some areas may actually be detrimental to it.

In this section, the proposed FTT is considered relative to a wider set of objectives, to see how it would perform. First, the Commission's stated objectives for the FTT are considered, to understand how the proposed FTT may perform against them, given the findings of this study. Second, the Commission's economic impact assessments are considered, to ascertain what evidence they provided in support of the effectiveness of the proposed FTT in achieving the objectives (drawing on past work by Oxera). Finally, a broader set of potential objectives is considered, against an assessment of the performance of the proposed FTT.

Section 10: Key findings

– Like other commentators, Oxera finds that the proposed FTT would perform poorly against the Commission's objectives for the tax.

– The Commission's impact assessments do not provide solid support for the proposals, and as shown in Oxera's previous work, using the Commission's analysis with more reasonable assumptions produces results showing that the tax is ineffective.

– The proposed FTT also performs poorly against a wider set of potential objectives.

Source: Oxera.

10.1 The Commission's stated objectives

In the initial impact assessment, the Commission referred to the following four objectives of introducing an FTT:[139]

– to raise revenue from the financial sector;

– to create disincentives for transactions that do not enhance the efficiency of financial markets;

– to avoid a fragmentation of the internal market that might be caused by uncoordinated tax measures of the Member States;

– to demonstrate how an effective FTT can be designed and implemented, generating significant revenue and paving the way towards a coordinated approach beyond the EU.

This study demonstrates that the proposed tax would be likely to fail to meet these objectives because:

– the FTT may actually have worsen public finances, thereby failing to raise revenue from the financial sector, while also being detrimental to the sector;

[139] See European Commission (2011), op. cit.

– the proposed flat-rate tax does not effectively target transactions that may be linked to increasing financial instability or excessive costs;

– the proposed tax under enhanced cooperation would apply to only 11 of the 27 Member States and so could damage the Single Market. The mobility of financial transactions suggests that the tax would need to be global to avoid relocation effects;

– the potential negative economic consequences identified in this report would not demonstrate that an FTT could be effective; indeed, the evidence presented here suggests quite the opposite.

Other studies have come to the same conclusion: leading taxation economists at Oxford University reached similar conclusions after the proposals were first released in 2011.[140] Before the proposals, the IMF came to a similar conclusion about the FTT, finding that it gave rise to a number of issues and thus concluded that the tax 'does not appear well suited to the specific purposes set out in the mandate from G-20 leaders.'[141]

10.2 The Commission's economic impact assessments

As set out in section 1, the Commission has published three sets of documents examining the potential impact of the proposed FTT. Do these impact assessments provide solid support for the proposed FTT achieving its objectives?

As discussed in Oxera (2011), the economic analysis underlying the Commission's 2011 impact assessment is reasonably sound, but some of the (major) adjustments made to the results after the detailed economic analysis was conducted were not justifiable. With more realistic assumptions, the results of the Commission's modelling produced results that were broadly consistent with those presented in this report. Oxera (2011) concluded that:

> While there are many uncertainties surrounding what economic impact the proposed tax might have, Oxera's review of the impact assessment finds that the Commission's own macroeconomic model suggests that the impact will be greater than it currently outlines in its proposal.[142]

Vella et al. (2012) came to a similar conclusion: 'More importantly, in the light of the Commission's own impact assessment, the writers can only conclude that more targeted and more efficient instruments should and could be used to achieve these objectives.'[143]

The Commission subsequently published 'Implementing enhanced cooperation in the area of financial transaction tax: Analysis of policy options and impacts' on February 14th 2013.[144] This staff working document is a response to the request by participating and non-participating Member States for an analysis of the impacts and economic consequences associated with the introduction of an FTT by way of enhanced cooperation. The document notes that, in the Council Working Party, several alternative policy options were raised and discussed—in particular, regarding:

– the taxation of intermediaries;
– the impact on government debt;
– the effect on the repo market;

[140] See Vella, J., Fuest, C. and Schmidt-Eisenlohr, T. (2012), 'The EU Commission's Proposal for a Financial Transaction Tax', British Tax Review, Paper No 14/2012, April.
[141] IMF (2010), 'A fair and substantial contribution by the financial sector — Final Report for the G-20', June, available at: http://www.imf.org/external/np/g20/pdf/062710b.pdf.
[142] See Oxera (2011), op. cit, Executive Summary.
[143] Ibid, p. 621.
[144] Document 'SWD(2013) 28 final', available at http://ec.europa.eu/taxation_customs/resources/documents/taxation/swd_2013_28_en.pdf

– the taxation of derivatives;
– the impact on pension funds.

Oxera (2013) provides a critical review of this latest impact assessment by the Commission. In summary, the Oxera review finds that:

– the FTT will make some transactions uneconomic; the Commission incorrectly assumes that the transactions that are deterred have little or no wider economic value, despite there being evidence that these transactions do have value;

– the effect of taxing intermediate transactions would be either to multiply the costs to end-users (such as end-users and companies raising capital) and/or to reduce market making and therefore reduce liquidity—neither of which is in the interests of end-users;

– the extent by which taxing secondary market transactions in government debt will increase sovereign borrowing costs and reduce market liquidity could be greater than the Commission assumes—these impacts are not consistent with the objective of reducing the burden of sovereign debt costs;

– the effect of taxing repos would be to make many valuable transactions uneconomic, and to introduce inefficiency into the repo market itself, and inefficiencies into those activities that use repos as a mechanism to reduce their costs and/or risks—these costs would ultimately fall on end-users;

– taxing derivatives will affect some hedging activities much more than others, deterring some forms of prudent risk management—this means that the Commission's assumption that the loss of derivatives trading will have no wider economic impact is less tenable;

– the effect of taxing transactions undertaken by pension funds, together with the effect of taxing intermediate transactions, would be to reduce the returns of pension products—this is not in the interests of people saving for their retirement.

This report addresses these deficiencies in the Commission's impact assessment by attempting to assess the economic impact both on the transactions that continue (essentially, the burden of the tax) and the transactions that no longer occur (the lost value to the economy of not undertaking these transactions).

10.3 Consistency with other stated objectives

There are many other objectives that the European Commission can be expected to be seeking to support, although these have not been directly linked to the FTT. Oxera has briefly reviewed a selection of these to highlight how they may be affected by the FTT. In all of these examples, the FTT would have a negative impact on the conditions for achieving the objective.

– **Encouraging lending to SMEs**—the FTT would raise the cost of most forms of financing for SMEs, including bank lending and equity issuance; as such the tax would worsen lending conditions for SMEs. This would help to undermine the Commission's objectivities for increasing long-term investment in the economy.

– **Government fiscal management**—the FTT would raise government funding costs and would reduce the liquidity of sovereign debt markets, both of which would make fiscal management more costly and more difficult. As estimated in section 9, the resultant increase in government borrowing costs would be significant, and would by itself outweigh the expected FTT revenues. Given the current weakness of government

finances among many of the FTT-zone Member States, this should be a core issue of concern.

– **Operation of monetary policy**—the FTT make the operation of monetary policy more difficult (as noted by central banks such as the Bundesbank) due to the damage caused to the short-term repo market. After a period of severe economic and financial crisis, such damage to the efficient operation of monetary policy should be an issue of concern.

– **Achieving a level playing-field for all EU member countries**—the FTT would interfere with the Single Market as, for example, a Swedish or UK bank (non-FTT) would have to treat a French (FTT) customer differently from a Finnish (non-FTT) customer. The issue of extra-territoriality is discussed further in Appendix 1.

– **Providing an efficient and fair additional stream of taxation**—the FTT would not be an efficient form of taxation, as this report finds that it could actually worsen public finances; nor would the FTT be particularly fair, as the burden of the tax would fall much more heavily on some forms of transaction than others (notably as it applies at a flat rate, irrespective of term length).

Overall, therefore, it would seem that the proposed FTT performs poorly against many other possible objectives of the European Commission.

11 Recommendations for improving the proposals

This study has found that the proposed FTT could have negative economic consequences that are so substantial that the tax could end up worsening public finances in FTT-zone countries.

This suggests that alternative forms of taxation should be considered if governments wish to raise taxation revenues. This was also the finding of the IMF (2010) and Vella et al. (2012), as explained in section 9.1.

In this section, Oxera considers which features of the proposed FTT are particularly damaging, and therefore suggests possible recommendations for improving the proposals. It should be noted, however, that economic theory suggests that taxation that directly affects business investment decisions is likely to be inefficient, and it is more efficient to tax end-users (eg, consumers or employees). See Box 11.1 below for further details.

Section 11: Key findings

– The findings of this report and the findings of economic theory on optimal taxation in general suggest that an FTT, however it is designed, is likely to be a poor tax in terms of efficiency.

– Specific issues with the FTT include its broad scope, which introduces considerable risk and uncertainty due to the potential impact on derivatives, repos and bonds.

– Academic evidence suggests that market makers should be excluded from the FTT, just as they are provided with exemptions from the existing national equity FTTs (eg, in the UK, France and Italy).

– Taxing repos, in particular, introduces the risk of serious unintended consequences, including to the efficient operation of monetary policy. This report has sought to assess some of the more tangible costs, but other uncertainties remain and could be significant.

– The impact of including sovereign debt in the remit of the tax is likely to be considerable, and should be a primary concern of governments in the FTT-zone.

Source: Oxera.

Box 11.1 Economic theory on optimal taxation

The relevant economic theory on optimal taxation was summarised by Mankiw (2009),[145] and there is a general agreement among economists that, in theory, 'capital income ought to be untaxed, at least in expectation'. This conclusion results from the following logic:

– ultimately, all taxation is paid by people, be they shareholders, employees or consumers, not by organisations;
– optimal taxation aims to minimise the impact of tax on economic production and consumption decisions;
– the cost of capital for equipment used in the production of future output should be treated the same as other business expenses; business expenses should not be taxed, as such tax will reduce incentives for economic production;
– optimal tax theory finds that taxes on the income and consumption of end-users are preferable to those on production.

[145] See Mankiw, G. (2009), 'Optimal taxation in theory and practice', NBER Working Paper 15071.

11.1 Poor tax efficiency is a critical issue

The poor efficiency of the proposed FTT suggests that the tax would not be an effective way to raise revenue as the resultant negative economic impacts will reduce other sources of government revenue and will raise the cost of government funding. It may be possible to mitigate the causes of the negative economic impact (as discussed below), but there are reasons to anticipate that any FTT will have low efficiency in terms of net tax returns, as follows:

– economic theory on optimal taxation finds that it is more effective to tax end-users , not tax investment (as the FTT does), —see Box 10.1 above;

– research into the UK stamp duty, which taxes the least mobile form of transactions (cash equities), still finds significant negative economic impacts and consequential low tax efficiency;[146]

– recent research into the new French FTT, which applies to cash equities, CDS (credit default swaps) and high-frequency trading, finds negative impacts on market quality and potential additional costs.[147]

This would suggest that alternative forms of taxation should be considered for the purposes of raising government revenue.

11.2 Broad scope of tax introduces considerable risk

While the research cited in section 11.1 found negative economic impacts from taxing cash equities, the impacts from taxing derivatives, bonds and repos could be more severe, as the findings of this report show:

– derivative transactions are likely to be much more mobile than cash equities, pointing to a risk of significant relocation;

– government bond trading could be hard hit, with the burden of the tax and the loss of liquidity ultimately driving up government funding costs;

– repos play a vital function in the financial system in terms of financial institutions accessing liquidity and the operation of monetary policy. The unintended consequences of making many (shorter-term) repos uneconomic (and hence inhibiting the repo market) are unknown and could be considerable.

These findings suggest that the negative economic impact of the FTT could be reduced by restricting the tax to cash equities, as the current FTTs in the UK and France do.

11.3 Exclusions for market makers are justified

The evidence presented in section 2.3 (Box 2.1) shows that market making improves market liquidity.[148] The FTT is likely to render much market-making activity uneconomic, which suggests that these activities will no longer occur. This in turn means that:

– there would be no tax revenue gained, as the transactions no longer occur;

[146] See Oxera (2007), 'Stamp duty: its impact and the benefits of its abolition', May, available from: http://www.oxera.com/Publications/Reports/2007/Stamp-duty--its-impact-and-the-benefits-of-its-abo.aspx

[147] See Haferkorn, M. and Zimmerman, K., (2013), 'Securities Transaction Tax and Market Quality - The Case of France', May, available at: http://ssrn.com/abstract=2229221

[148] For a more detailed investigation into the role of market making, see Oxera (2013).

– there would be a negative impact from the loss of market quality.

This poor outcome could be avoided by exempting market makers. It is notable that all the existing financial transaction taxes in Europe (eg, in France, Italy and the UK) exclude market makers. Further analysis on this is warranted.

11.4 Taxing repos could have serious unintended consequences

As described in sections 6 and 8 of this report, taxing repos would be likely to result in significant negative economic consequences, for a number of reasons, including:

– deterring financial institutions (eg, banks) from holding less liquid, longer-term assets, as they would be less able to access liquidity if required (due to the inhibiting of the repo market);

– potentially creating a risk to financial stability by reducing banks' ability to access liquidity from longer-term assets;

– affecting the operation of monetary policy.

The revenue from taxing repos is not likely to be significant, as only the longer-dated repos are likely to continue under the tax (see section 6). The Commission did not include revenue from taxing repos in its estimate of the FTT revenues.

Consequently, the potentially serious negative consequences and limited likely revenues suggest that repos should be exempt from the FTT.

11.5 Impact on sovereign funding costs could be significant if bond trading is taxed

The impact on taxing transactions of sovereign debt should be particularly concerning to FTT-zone governments. The burden of the tax and the impact on market quality will ultimately mean higher funding costs for government. This report finds that any net tax revenue due to the FTT (which is likely to be limited) is likely to be more than offset by increased funding of government debt in the longer term. This finding suggests that the FTT could **actually worsen public finances**.

Therefore, from the point of view of governments, there would be good reasons for excluding sovereign debt transactions from the FTT.

A1 Extra-territoriality

The proposed FTT would apply to transactions beyond the 11 EU Member States pursuing its introduction. These extra-territorial impacts conflict with the stated G20 objectives to 'monitor and minimise the negative spillovers on other countries of policies implements for domestic purposes', and the proposals have been met by formal resistance. For example, the UK Treasury has launched legal proceedings with the European Court of Justice to challenge the proposed tax in relation to its anticipated impact on the UK economy.

As set out in the revised proposal for a Council Directive, the FTT would apply to all financial transactions in which one (or more) of the following conditions is met:

– either the buyer or seller is resident in an FTT-zone country (applies to both natural and legal persons);
– the financial instrument is issued in an FTT-zone country (excluding derivatives issued in an FTT-zone country that are not traded on an organised platform); or
– an FTT-zone financial institution, or any of its foreign branches, is involved in the transaction.[149]

The implication of these broad criteria is that the FTT would apply to transactions that took place beyond the FTT-zone countries that have agreed to adopt it, extending tax-collecting responsibilities to non- FTT-zone authorities and institutions as well. For example, owing to the introduction of the issuance principle, should a US and UK bank trade German issued shares in the USA, the FTT would, in principle, be applied to both sides of the transaction, with any tax paid due to the German government. In such a scenario, the German tax authority could require the UK bank to pay both sides of the tax, and bear the cost of recovering the amount due from the non-EU institution under the EU mutual assistance regime.

The combination of the issuance principle and EU mutual assistance regime has created concerns that the FTT may place UK banks at a competitive disadvantage to banks established in other non-FTT-zone countries.[150] This is because, in comparison to a trade involving a UK bank in which the mutual assistance regime would apply, it is difficult to see how an FTT-zone national tax authority (or the Commission) would collect the tax applicable on the issuance principle if the transaction took place outside the EU and between two non-EU institutions.

How the issuance principle will be applied to, and therefore affect the trading of derivatives is still not clear. This is due to the ambiguity over who issues a derivative contract and the potential for an identical derivative contract to be issued by multiple institutions.

In the same way that equities listed on an exchange for trading are not issued by the exchange (but by the company to which the equities relate), derivatives listed for trading by exchanges are not issued by the exchange, but are created by the financial institutions, which offer to buy or sell them in the standardised form that the exchange has stipulated. To the extent that the creation of a derivative contract is the equivalent of issuance in relation to equities, the financial institutions trading on the exchange are the issuers of derivative

[149] European Commission (2013), 'Proposal for a council directive implanting enhanced cooperation in the area of financial transaction tax', February 14th 2013/0045. Chapter 11, articles 3 and 4.
[150] For example, see the House of Lords Sub-committee report on the Financial Transactions Tax. Available from: http://www.parliament.uk/business/committees/committees-a-z/lords-select/eu-economic-and-financial-affairs-and-international-trade-sub-committee-a/inquiries/financial-transaction-tax/

contracts, and not the exchange. As the same derivative contract can be issued by multiple institutions and the counterparty to a derivative contract when it is traded on an exchange is generally unknown, there will be substantial uncertainty over the domicile of the issuing (financial) institution, and therefore the extent to which a derivative contract falls within the scope of the FTT.

Alternatively, if the tax base is designed to include any standardised derivative contract that has been approved for trading on an exchange located in FTT-zone, the problem will arise of enforcing the tax payment where transactions take place between legal or natural persons resident inside the FTT-zone and outside it (see above, in relation to equities and bonds). In addition, because derivatives with minor variations can be created, it would be possible for an exchange outside the FFT-zone to create similar (but not identical) derivatives to trade on their exchange. For traders not domiciled in the FTT-zone these transactions would be outside the tax base.[151]

All this means that applying the issuance principle, as it is currently drafted, to derivative transactions is likely to impose substantial practical challenges. The uncertainty over whether a particular transaction would be captured or not could have an exaggerated impact on the market. For example, non-FTT-zone institutions wishing to trade a Euribor-linked derivative currently listed for trading on Eurex, but concerned about their potential exposure to the FTT, might choose to switch to OTC transactions, potentially using copycat-type products.

The broad definition of 'establishment' would also be expected to increase the scope of transactions captured to institutions beyond the 11 EU Member States pursuing its introduction. For example, transactions between UK offices of any bank authorised within one of the EU11 countries would be within the scope of the FTT. Deutsche Bank is one example of an established bank within the FTT-zone with a large UK office.

These direct extra-territorial impacts conflict with the stated G20 objectives to 'monitor and minimise the negative spillovers on other countries of policies implements for domestic purposes', and the proposals have therefore been met by formal resistance.[152] For example, the UK Treasury has launched legal proceedings with the European Court of Justice, under Article 327 of EU law, to challenge the proposed tax on the anticipated impact on the UK economy.

[151] A further alternative interpretation is that the place of issuance of a derivative is the domicile of the underlying.

[152] G20 (2013), 'Communiqué issues after the February 15th meeting'.

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