Oxera

What would be the economic impact of the proposed financial transaction tax on the EU?

Review of the European Commission's economic impact assessment

Prepared for:
Association for Financial Markets in Europe; ASSOSIM (Italian Association of Financial Intermediaries); Nordic Securities Association (NSA)

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Executive summary

The European Commission has adopted a proposal for a financial transaction tax (FTT), setting out the proposed base and rate of the tax. The Association for Financial Markets in Europe, ASSOSIM (Italian Association of Financial Intermediaries) and Nordic Securities Association (NSA) (hereafter referred to as 'the European trade associations') asked Oxera to review the Commission's impact assessment of the proposals. This review focuses on the principal elements of the Commission's economic impact assessment and considers selected unintended consequences not included in that assessment. This report presents the findings of Oxera's review.

Macroeconomic impact

The Commission's economic impact assessment includes an estimate of the potential impact of the proposed FTT on the GDP of the European Union (EU). The Commission concludes on the basis of its macroeconomic model that 'the negative impact on the GDP level in the long run is expected to be limited to 0.53% as compared to the baseline scenario.'[1]

An economic impact of 0.53% of GDP is significant compared with the revenue expected to be collected by the tax. 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. This is because, although Oxera found many of the Commission's assumptions to be valid, some of the assumptions are unlikely to be valid and a number of additional effects have been overlooked, as follows.

– The Commission's economic impact assessment is based on a significantly lower burden of FTT than is expected in the revenue-raising estimate in its proposal, suggesting that the proposal would either have a greater economic impact or would generate significantly less revenue.

– The Commission assumes that the ending of high-frequency trading in the EU (due to the FTT) would mitigate the economic impact; this assumption is not supported by the evidence and appears to be inconsistent with the modelling of the economic impact.

– The financing of business investment using retained earnings is unlikely to be 'ring-fenced' to the degree assumed by the Commission, further exacerbating the negative impact on GDP.

– The possibility of financial services and capital relocating outside the EU makes the economic impact highly uncertain. These effects have not been modelled by the Commission.

It is helpful to put GDP impact estimates into context by comparing them with expected tax revenues. The Commission's central estimate of the revenue from the proposed tax, as presented in its economic impact assessment, is €37 billion per annum,[2] which is about 0.3%

[1] 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, p.3.

[2] As quoted in European Commission (2011), 'Impact assessment', SEC/2011/1102, Commission Staff Working Paper, volume 1, p. 44.

of current annual EU GDP.[3] As noted above, the Commission's estimate of the long-run impact on GDP is 0.53%, which could equate to a loss of general tax revenue of around 0.21% of GDP (based on current tax revenues[4] being equivalent to around 40% of GDP[5]), which is about €26 billion per annum based on current estimates of EU GDP. This means that, even based on the Commission's own assumptions, the tax would not appear to be efficient in collecting revenue, since over half of the revenue would be lost due to the negative impact on other tax sources.

The efficiency of the tax looks worse if some of the Commission's assumptions are adjusted to reflect more realistic scenarios. These scenarios suggest a negative impact in excess of 2% of GDP, resulting in a loss of general tax revenue of nearly 1% of GDP. At these levels of impact on GDP, there is a risk that the imposition of the tax actually reduces total tax revenues from the economy. Given this risk, Oxera considers that the impact assessment would need to be significantly more thorough and based on more robust evidence before a well-informed decision could be made about the proposed FTT.

Economic impact in an 'open economy'

The economic impact discussed above (based on the Commission's economic model) was for a 'closed economy', which does not consider how the impact changes when there are trading partners outside the EU without the proposed tax. Given the highly mobile nature of both capital and the financial services sector itself, consideration of the 'open economy' changes the potential economic impacts, as follows.

– The tax can be avoided by non-EU investors and companies using non-EU financial institutions rather than EU financial institutions. EU investors and companies may also be able to reduce their exposure to the tax by using non-EU financial institutions.

– This creates an incentive for EU financial institutions to relocate outside the EU.

– There is also an incentive for investors to favour non-EU companies ('capital flight') due to the imposition of the tax.

The extent to which financial institutions might choose to relocate outside the EU is uncertain, and as the Commission explains in its impact assessment, the evidence on the threat of relocation is mixed.[6]. Given this uncertainty, Oxera considers open-economy impacts in terms of two different scenarios for the economic impact relative to that discussed for the closed economy, depending on the effectiveness of the proposed FTT in collecting tax revenue. In summary, one can paint two possible scenarios.

1. The proposed FTT is ineffective in collecting tax revenues as financial services activity relocates outside the EU and investors are able to invest in EU companies without incurring much tax; in this case, there is a significant loss of financial services activity (particularly for countries such as Luxembourg and the UK), but the wider economic impact is less severe than predicted by the closed economy model, since the tax burden on investors is lower.

2. The proposed FTT is effective in collecting tax revenues, since financial services are either unable to relocate overseas, or doing so does not help to avoid the tax when

[3] The International Monetary Fund estimates that the GDP of the EU in 2010 was approximately €12,300 billion.

[4] It is common practice to produce rough estimates of long-run impacts on tax revenue using an assumed rate of taxation to GDP, as this rate remains broadly stable over time. A more precise projection may be produced using a more complex macroeconomic model, but this was outside of the scope of this study.

[5] Oxera assumption based on a review of Eurostat data for tax revenues and GDP across Europe.

[6] See section 3.1.4 of Volume 1 of the impact assessment for a summary of the Swedish experience, where an FTT caused significant relocation. See also Volume 9 of the impact assessment.

investing in EU companies; in this case, the economic impact is at least as severe as in the closed economy. In addition, however, there may be other effects that operate through international competitiveness that directs new investment away from the EU and/or EU companies and thus further depresses the EU economy compared with the rest of the world.

In both scenarios, however, the (net) revenue collected by the proposed FTT is likely to be poor since, in the first scenario, the collection of revenue is ineffective and tax revenue is lost from the relocation of financial services activity, while in the second scenario the large negative impact on GDP significantly affects the collection of other taxes.

Eurozone FTT

There has been some discussion of the possibility of an FTT for the eurozone countries alone if non-eurozone EU countries are resistant to the Commission's proposals.

The economic impact of the proposed tax on the countries that adopt the tax will be similar for a eurozone tax as considered in this report for an EU-wide tax, although the threat of relocation out of the eurozone is likely to be more severe for a eurozone tax, given the importance of London as an international financial centre.

Financial institutions in London and other non-eurozone EU financial centres would, however, be affected by a eurozone FTT because their transactions with eurozone customers would be subject to the tax. Further analysis would be required to ascertain what the overall impact on non-eurozone EU countries would be from a eurozone tax.

Economic incidence

The Commission itself acknowledges that 'a large part of the burden would fall on direct and indirect owners of traded financial instruments'.[7] Direct and indirect owners of financial instruments refers to the end-users of securities, which will include companies (which use securities to raise capital and hedge risk), pensioners (through their pension funds), individuals directly owning securities or mutual funds (which in turn own the securities), and customers of insurance companies (who hold securities to reduce the cost, and hence price, of insurance contracts).

An FTT increases the cost of transactions in securities and derivatives. Economic theory indicates that |in a competitive market such an increase in costs would be passed on to the end-investors (in the form of lower post-tax returns) or companies (in the form of a higher pre-tax cost of capital). As a result, Oxera finds that, for most transactions, it would seem sensible to assume that the pass-through of the tax from traders to investors or companies is close to 100%, including for any intermediate transactions that are induced by the investor's own initial transaction ('cascading transactions'). This would suggest that it will ultimately be investors and companies that pay the tax, not traders.

The burden of the tax will be shared between end-investors and companies, with the split dependent on the extent to which end-investors can invest in investment not subject to the tax as a substitute for investing in investments that are subject to it. In practical terms, this means the extent to which investors would be likely to switch to bank savings or non-EU investments, both of which would be affected by the tax, but probably to a lesser extent than EU investments. If they can shift to other investments then EU companies will be forced to raise the rates of return offered by their investment opportunities. This dynamic is captured in the Commission's impact assessment economic model as investors have the choice between riskless government debt (untaxed) and company equity (taxed).

[7] See the impact assessment, volume 1, p. 53.

Ultimately the tax falls on wider society whichever route it takes—hitting either investors and pension funds, or companies.

Oxera developed three illustrations of common financial services to better understand how the tax could affect retail investors and companies. Illustrative calculations showed that the proposed FTT could:

– reduce the final value of a typical pension fund by around 2.7–5.5%, depending on the degree of 'cascading' effects;

– reduce the annual rate of return on an illustrative retail investment with a capital guarantee by around 0.8 percentage points;

– reduce the profits of an exporting manufacturing firm involved in a range of related hedging activities, which could be sufficient to encourage relocation of hedging activities to outside the EU (to avoid the tax).

It is likely that these negative impacts would be mitigated to some extent by changes in trading behaviour and relocation of financial services activity outside the EU. These changes in behaviour would not be without costs of their own, however.

Further unintended consequences

The proposed FTT would be likely to have other significant consequences for the EU economy that are much more difficult to quantify. Oxera considered a wide range of implications and focused on a small selection that could be described as 'unintended consequences'. These impacts were not identified in the Commission's impact assessment and would be unlikely to be seen as beneficial from a public policy point of view. The unintended consequences considered by Oxera were as follows.

1. The impact on liquidity in the banking sector—the transaction tax would, for example, apply to repurchase agreements (repos), which allow banks to hold less liquid assets (such as government debt) rather than highly liquid cash, and therefore allow them to boost returns on their assets. Much of the current repo activity by banks would be uneconomic with the proposed FTT, and hence the proposals could force banks to replace less liquid assets with cash holdings, which would increase their costs.

2. Disincentives for risk management—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 because 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. While the cost of the tax for an individual derivative appears low relative to the underlying asset, as the rate of tax is proposed at only 0.01% of nominal value for each side of the transaction, due 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.

3. Disincentives for holding debt securities, including EU government debt—the proposed FTT discourages the holding of EU government debt because: (i) the application of the tax in the secondary market for government bonds increases the rate of return required by investors (just as it does for the cost of equity); (ii) the increased cost of repos encourages banks to hold more cash and less government debt; and (iii) the increased cost of associated derivatives (including credit default swaps, and currency and interest rate hedging) effectively raises the cost of investing in government debt, and therefore increases the required rate of return.

Conclusion

The proposed FTT is likely to have a significant and highly uncertain negative impact on the EU economy—not just for international financial centres such as London, but for all business and investors in the EU. The Commission's economic impact assessment already finds a significant negative impact, yet Oxera's review suggests that the negative economic impact is likely to be larger even than the Commission expects (or, alternatively, the revenue raised by the tax will be much lower). With the additional uncertainty of financial services relocation and capital flight outside of the EU, as well as 'unintended consequences', the overall likelihood of the proposed tax increasing total net tax revenues of EU governments is uncertain.

In this context, Oxera would suggest that the results of the Commission's economic impact assessment do not provide an appropriate degree of confidence on the potential economic impact and consequent net impact on tax revenues. A further examination of the potential economic impact would therefore be necessary before a well-informed decision could be made about the proposed FTT.

Contents

List of tables

List of figures

1 Introduction

1.1 Context and remit

The European Commission has adopted a proposal for a financial transaction tax (FTT), setting out the proposed base and rate of the tax. The Commission provides the following rationale for this proposal:[8]

– to avoid fragmentation in the internal market for financial services, bearing in mind the increasing number of uncoordinated national tax measures being put in place;

– to ensure that financial institutions make a fair contribution to covering the costs of the recent crisis, and to ensure a level playing field with other sectors from a taxation point of view;

– to create appropriate disincentives for transactions that do not enhance the efficiency of financial markets, thereby complementing regulatory measures aimed at avoiding future crises.

Attached to the Commission's proposal were a number of research documents that provided information for the Commission's economic impact assessment. The research includes some interesting findings including some that might not provide support for the proposals, such as a potentially material negative impact on GDP. The International Monetary Fund (IMF) has also published research into the feasibility of such a tax. In addition, there is some academic literature focusing on the pros and cons of the type of FTT being proposed.

The European trade associations[9] asked Oxera to review the Commission's impact assessment. The Commission's own analysis suggests that the negative impact on the wider economy could be quite significant, and therefore it is believed that it is important to gain a better understanding of what that economic impact might be. Specifically, the European trade associations asked Oxera to examine the Commission's impact assessment.

The scope of this report is limited to a review of the principal elements of the Commission's economic impact assessment, and consideration of selected unintended consequences not included in that assessment. The report does not assess the extent to which an FTT achieves its objectives, nor the extent to which the financial services sector is (or is not) under-taxed (claims of under-taxation have been used to support proposals for an FTT). The study was conducted in a relatively short timeframe, and developing an alternative model of the potential economic impact was beyond its scope.

This report presents the findings of Oxera's review.

1.2 Approach

For this study, Oxera conducted a review of the Commission's proposals and economic impact assessment, and considered how any deficiencies or gaps in the analysis could alter the resultant conclusions on the likely economic impact of the proposals. In particular, Oxera conducted:

[8] 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.

[9] As defined in the executive summary, including the Association for Financial Markets in Europe, ASSOSIM (Italian Association of Financial Intermediaries), and Nordic Securities Association (NSA).

– a review of the Commission's economic impact assessment, including consideration of the economic models and assumptions used;

– a review of other relevant sources, including academic literature, analysis of the proposals by other commentators, and previous studies by Oxera in this area. Oxera also discussed some aspects of the economic assessment with Commission staff to clarify understanding;

– an analysis of the deficiencies and gaps identified in the Commission's assessment, to provide some guidance on their likely significance;

– an appraisal of the likely consequences for the economic impact after consideration of the deficiencies and gaps in the assessment.

The study was based on desk research that included a number of discussions with academics and industry practitioners, particularly in the banking sector.

1.3 Structure of the report

This report is set out in the following sections:

– section 2: macroeconomic impact—based on a review of the Commission's economic impact assessment;

– section 3: economic incidence—including illustrations of the resulting tax burden;

– section 4: unintended consequences—other impacts described qualitatively;

– section 5: conclusions.

2 Macroeconomic impact

The Commission's economic impact assessment includes an estimate of the potential impact of the proposed FTT on the annual GDP of the EU. The Commission concludes that 'the negative impact on the annual GDP level in the long run is expected to be limited to around 0.5% as compared to the baseline scenario.'[10] The calculation of this estimate is explained in the main impact assessment document[11] and the attached Annex 15.[12]

An economic impact of 0.5% of annual GDP is significant compared with the revenue expected to be collected (as discussed in section 2.1.4 below). Oxera considers that, for proper consideration of the proposals, there needs to be confidence around the estimates for this key factor. For this reason, Oxera reviewed the Commission's GDP impact assessment in detail.

Oxera examined the impact assessment documents, as well as relevant academic literature, to assess whether the conclusion about the potential impact on GDP is appropriate. The economic model that the Commission uses (referred to below as the 'model') is for a 'closed economy'.[13] As such, the potential GDP impact for a closed economy was considered first, followed by the potential implications of relocation, tax avoidance and capital flight that could arise in an 'open economy'.[14]

2.1 GDP impact for a 'closed economy'

For the impact assessment, the Commission developed a highly theoretical economic model of a hypothetical closed economy to estimate the potential impact of the proposed FTT on the GDP of an economy with no influence from the outside world. In the review of this model and the results, Oxera considered:

– the conceptual basis of the model used;
– the rate of FTT used in the model;
– additional adjustments made by the Commission on the results of the model;
– the overall long-run impact on GDP relative to tax revenue;
– short-run dynamics.

2.1.1 The conceptual basis of the model

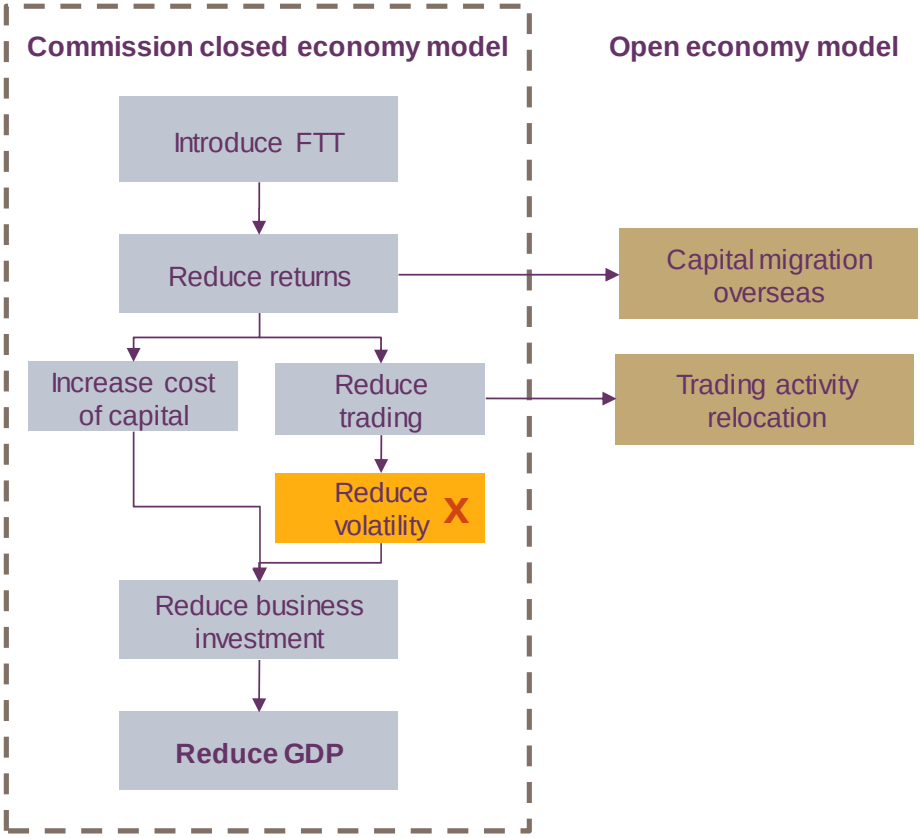
The model developed by the Commission is a general equilibrium model of a hypothetical closed economy that models the incentives for trading equity and investing in the wider economy in order to model the economic implications of the FTT.

The primary route through which the proposed FTT is modelled to have an impact on GDP is through the impact of the tax on the cost of capital, and hence on the future levels of investment. The tax increases the transaction costs for trading equity (and other financial instruments), which in turn lowers the expected net return to investors. In order to restore the net return to investors, they will require a higher gross rate of return from firms, to restore their compensation for investing in risky equity relative to current consumption or riskless

[10] See the Commission's proposal, COM(2011) 594, p. 3.
[11] European Commission (2011), 'Impact assessment', SEC/2011/1102 final, Volume 16: Effects on Macroeconomic Variables.
[12] Ibid.
[13] A 'closed economy' model assumes that there are no other economies with which to trade, and therefore effectively models the impact of a truly global FTT.
[14] An 'open economy' model, in this context, considers the implications of there being other large and advanced economies where there would be no FTT. This would of course be the case with the proposed EU-only FTT.

savings. The higher expected gross rate of return means that the cost of equity for firms is higher, which in turn discourages firms from making investments in the real economy, leading to lower economic growth and lower GDP. This logic is presented in diagrammatic form in Figure 2.1.

Figure 2.1 Conceptual basis of the closed-economy model, and links to the impact of using an open-economy model



Source: Oxera.

The model also attempts to capture another assumed impact of the proposed FTT: it assumes that 50% of trades (before the introduction of the FTT) are done by 'noise traders',[15] who are assumed to trade 'irrationally' and increase the degree of equity price volatility. Increases in equity price volatility are themselves assumed to lower levels of investment (and hence GDP), but, since noise traders are discouraged from trading by the FTT, its imposition results in a lower level of price volatility. This reduction in price volatility then boosts investment and therefore GDP, but by a much lower amount that the reduction in investment and GDP due to the increase in the cost of capital. Overall, the model finds that the price volatility effect is relatively immaterial.

The proposed FTT is modelled as an increase in the transaction costs of trading. For example, if the FTT is input as 0.2% then the transaction cost of trading increases by 0.2% of the value of the equity being traded. In the model, this translates into an increase in the cost of equity of 0.4 percentage points.[16] The results of the model suggest that the cost of capital rises by only 0.2%, since half of the investment is assumed to be in riskless government debt, which is assumed not to incur the FTT.

[15] The concept of 'noise traders' used by the Commission was described in Bradford de Long, J., Shleifer, A., Summers, L.H. and Waldman, R.J. (1989), 'Noise Trader Risk in Financial Markets'.

[16] The impact on the cost of equity depends on the velocity of trading. For example, if an investor buys the security and then sells it after one year, and each trade incurs a tax of 0.2% which falls entirely on the investor as the trader passes on the cost of the tax, the overall tax burden is 0.4% in a year, for which the investor will want to be compensated through higher returns.

Oxera's review of the conceptual basis of the model concluded that:

– the tax can be modelled as an increase in transaction costs of trading, as the model has done;

– the primary impact of the proposed tax on the wider economy would be through the cost of capital and therefore support the underlying logic of the primary mechanism of the model;

– the model does not consider derivatives; it considers only a tax on equity trading, and therefore the results need to be considered for a world with no other securities trading. As such, the output of the model for the FTT tax revenue needs to be broadly consistent with the total expected FTT tax revenue, including derivatives; however, as noted below, this is not the case;

– the exclusion of derivatives from the model also results in the model failing to pick up any impact of the tax on corporate use of derivatives other than for financing purposes (eg, for hedging currency risk);

– the assumption that irrational noise traders increase price volatility is not supported by evidence, including the evidence cited by the Commission. The impact study refers to a paper by Hemmelgarn and Nicodeme, which lists studies that 'find that short-term investment and speculation might be efficiency improving'.[17] However, as this assumption has little impact on the results, Oxera decided not to examine this feature of the model further;

– the model does not consider any potential impact of the tax on the frequency and severity of financial crises; this assumption would appear appropriate as the Hemmelgarn and Nicodeme paper,[18] noted above, did not find strong evidence that an FTT would reduce the likelihood of financial crises occurring.[19]

Overall, the model adopts a broadly sensible approach for an initial assessment of the potential economic impact for a closed economy,[20] but it has some important shortcomings and it is necessary to consider the additional effects of an open-economy situation.

2.1.2 The rate of FTT used in the model

The model was parameterised on the basis of the EU economy. Details of the parameterisation were not provided in the impact assessment, but Oxera considered that this was unlikely to be a key concern in its review; rather, the main concern is the assumption for the assumed rate of the proposed FTT.

The tax rate assumed in the impact assessment varies in different parts of the assessment. In the section that presents the economic model (part 16), a tax rate of 0.2% for the securities transaction tax (STT) is assumed on the basis that this produced the expected amount of tax revenue:

> In the baseline calibration STT was set so that the implicit tax rate (the ratio of the tax revenue to the tax base) was around 20 basis points (see the header of the 'STT' part of

[17] Hemmelgarn, T. and Nicodeme, G. (2010), 'The 2008 Financial Crisis and Taxation Policy', CEB Working Paper No. 10/006, January, p. 31.

[18] See section 5.1 in particular.

[19] For example, the causes of the recent financial crisis were not linked to excessive numbers of transactions, but rather to financial securities (such as US mortgage-backed securities) that were not traded very frequently.

[20] Oxera notes that a similar conceptual framework was used in Oxera (2011), 'Stamp duty: its impact and the benefits of its abolition', May 2007, available from http://www.oxera.com.

Table 1). This corresponds to revenue raised with the tax of 0.16% of GDP on average[21]

With EU GDP at about €12.3 trillion in 2010,[22] this would suggest tax revenue of approximately €20 billion. This is considerably lower than the Commission estimate of €37 billion,[23] although the model does not include derivatives and assumes that all transactions involve equity. It is not easy to interpret the model results for tax revenue, but it is clear that the revenue estimate in the model is (significantly) less than that which the Commission uses on the benefits side, and the authors of the paper thought that it was consistent with the expectations for revenue.

The impact assessment appears to have been conducted on the basis of the tax rate being 0.1% for securities, which is then increased to 0.2% in the Commission's proposal document for transactions involving two financial institutions. This explains why the impact assessment revenue estimate of €37 billion is increased to €57 billion in the proposal.[24] Despite the fact that the revenue estimate of the model with a 0.2% tax is already lower than the impact assessment estimate of €37 billion, the Commission chose not to use the results of the model presented in volume 16 for a 0.2% tax, but instead the results for a 0.1% tax. This lower tax rate produces approximately half of the tax revenue, at approximately €10 billion.

Oxera is aware that any attempt to model the economic impact of a proposed tax—particularly one that is likely to trigger significant behavioural changes—is highly uncertain, and one should not focus too much on the consistency of modelled definitions of tax rates. Instead, at a high level, the most important determinant of the impact of the tax on the wider economy is the amount of tax that must be paid by investors investing in productive capital. In short, if one wishes to understand the impact of an FTT that is expected to raise €57 billion per year, one must model a tax that produces revenue that is consistent with this estimate.

The limitations to the model, such as the exclusion of derivatives, do not mean that additional tax revenue can be collected without increasing the impact on GDP. Higher revenues from the tax—because either the rate is higher or other financial instruments are included in the tax base—will also have an impact on GDP if the payment of the tax reduces the (net) return to investors who then require higher gross returns from those actually making investments in the real economy (funded by either debt or equity). In addition, to the extent that derivatives also have an impact on the gross cost of capital, making these more expensive through the tax can also be expected to have an impact on the gross cost of capital needed to meet the demands for net (risk adjusted) returns for investors.

Furthermore, the Commission proposal is for a tax rate of 0.2% per trade for transactions between two financial institutions, which comprise the vast majority of transactions. The effective tax rate for investors could be even higher than this if there is a cascading series of transactions required to complete the final transaction involving the end-investor (see Box 2.2 below) that are not already included in the model. However, the impact of this on the model is uncertain because the number of cascading transactions would be likely to decline if the tax were in place, and the impact on the appropriate framework and calibration of the model is not clear.[25]

While it is not clear by how much the effective tax rate for investors could be above 0.2%, it is clear that, for most trades, the tax rate is at least 0.2%. This is highlighted by the Commission's own calculations of tax revenue, which were increased from €37 billion for the

[21] European Commission (2011), 'Impact assessment', SEC/2011/1102 final, Volume 16: Effects on Macroeconomic Variables, p. 37.

[22] International Monetary Fund (IMF) estimate for 2010.

[23] As quoted in the impact assessment, volume 1, p. 44.

[24] This is the Commission's expectation of tax revenue described on p. 11 of its proposal.

[25] The model assumes that 50% of trades are done by irrational 'noise traders' and 50% by rational investors. It is not clear how intermediary 'cascading' trades would fit into this framework or its calibration.

0.1% tax modelled in the impact assessment[26] to €57 billion quoted in the Commission's proposal document[27] after the decision to tax transactions between financial institutions at 0.2%.

Overall, therefore, the reasons set out above would suggest that a tax rate of 0.2% should be used in the model, as was used in the original model set out in volume 16 of the impact assessment. This produces a long-run impact on GDP of 3.43%, which is nearly double the 1.76% of GDP quoted by the Commission.

2.1.3 Additional adjustments made by the Commission

The Commission chose not to accept the output of the model in terms of impact on GDP. Instead, it applied a number of downward adjustments to the estimated impact, since it believed that the model overstated the impact, for the following reasons:[28]

- exclusion of primary markets from the tax;
- exclusion of transactions that do not involve financial institutions;
- the assumed zero value of high-frequency trading activity;
- the assumption that the tax would have less of an effect on the cost of financing investment through retained earnings and bank lending.

Oxera considered each of these adjustments in turn.

Exclusion of primary markets

The Commission estimates that 2.2% of security transactions take place in primary markets (ie, the initial sale of the security) which would not incur the tax. It therefore reduces the economic impact by 2.2%.

This adjustment would appear to be conceptually reasonable, assuming that the 2.2% figure is correct,[29] since this proportion of transactions would not be affected and therefore would not place a direct tax burden on investors at this initial sale (although of course they would be affected by the tax when they sell the security in the future). Investors would therefore not need to be compensated through higher pre-tax returns (and hence lower investment).

Exclusion of transactions that do not involve financial institutions

The Commission estimates that 15% of transactions do not involve financial institutions and therefore do not incur the proposed tax. It then assumes that the impact on GDP should be reduced by a further 15% accordingly.

On the basis that the 15% estimate is correct, reducing the impact due to the exclusion of transactions that do not involve financial institutions would be conceptually reasonable on the same basis as it would be for excluding transactions in primary markets. One conceptual explanation for this adjustment is to imagine that 15% of businesses (in terms of their productive capacity) are financed by individual venture capitalists (who do not pay the proposed tax), and therefore 15% of the productive economy is outside the scope of the tax and is not affected.

The assumption of 15% is not, however, backed up by evidence, nor is it not clear where the figure came from. The Commission's definition of a financial institution is broad and is likely to capture the vast majority of transactions. The 15% estimate may be excessive, but without evidence on what the number should be, the assumption is not rejected at this stage.

[26] Impact assessment, volume 1, p. 31.

[27] Proposal, p. 11.

[28] See the impact assessment, volume 1, p. 51.

[29] The Commission does not provide supporting evidence for this assumption, and Oxera has not tested the validity of this assumption.

Assumed zero value of high-frequency trading activity

More material and more debatable is the Commission's assumption that the GDP impact should be reduced by 40% due to its assumptions that 40% of trades are done by high-frequency traders (HFTs), and that these trades have no value for the real economy.

The Commission's assumption is based on the notion that trades by HFTs do not improve the efficiency of the capital allocation system and if these trades stop, due to the introduction of the tax, there will be no negative consequences for investors or the wider economy. The Commission is implicitly assuming that the economic model is overestimating the volume of trades that continue following the introduction of the tax, and therefore overestimating the amount of tax that ends up being paid by investors, and in turn overestimating the impact on GDP.

There are a number of reasons for rejecting the validity of this assumption, as follows. Each of these reasons is independent from the others and sufficient on its own to reject the assumption.

– The model already includes an assumption that 50% of trades come to an end due to the tax, as they are conducted by 'noise traders'. The Commission's reduction by a further 40% for HFTs would result in transactions declining by a total of 70%. This result is inconsistent with the Commission's assumptions on the loss of transactions due to the tax, which is assumed to be only 10% for equity trading.

– Similarly, if the Commission assumes that 40% of remaining trades in the model are done by HFTs that cease then the model's estimate of tax revenue must be reduced by 40% as well. This would bring the model's estimated revenue to far below the Commission's revenue estimate. In doing so, it would make the estimated economic impact inconsistent with the Commission's proposal, since the key determinant of economic impact is tax burden on investors and companies.

– There is no clear evidence that high-frequency trading has no economic value; the research to which the Commission refers in its impact assessment does not provide the basis for its assumption that high-frequency trading has no value and can be excluded. Recent academic literature suggests that this form of trading has generally improved market quality.[30] Although some research has suggested that there may be greater potential for periodic illiquidity as a result of high-frequency trading, there no evidence to conclude that, overall, this trading has a negative impact. Fully understanding the impact of high-frequency trading would require further empirical analysis.

– The Commission's assumption of 40% of transactions being by high-frequency trading may hold for some markets, but no evidence is provided to suggest that it is appropriate for all markets on average. Indeed, the Commission states that: 'High-frequency trading could be up to 40% of the total on some market segments', not 40% on average across all market segments.[31]

This assumption is therefore not included in the alternative calculations presented below.

Reduced impact of tax on company finance through retained earnings and bank lending

The Commission assumes that only half of the effect of the FTT on the cost of capital applies to the equivalent cost of funding using retained earnings and bank lending. Due to the importance of these two sources of funding for European companies, this results in a

[30] See a summary of recent literature; for example, Foresight (2011), 'The Future of Computer Trading in Financial Markets'. Published as a working paper on the UK Government website: http://www.bis.gov.uk.
[31] Impact assessment, volume 1, p. 52.

reduction in the impact on the cost of funding by a further 40%. The Commission therefore reduces the impact on GDP by a further 40%.

Oxera considered the two elements of funding—retained earnings and bank lending—separately.

Retained earnings

In volume 16 of the impact assessment, the Commission presents findings of the economic model using a 0.2% tax rate (which is the tax rate that Oxera suggests would be appropriate for the model in this case, rather than the 0.1% tax rate used by the Commission in its summary of the economic impact). The 0.2% tax rate results in an increase in the cost of equity of 0.4 percentage points, according to the model.

The Commission assumes, however, that the impact on funding using retained earnings would be only half of this, or 0.2 percentage points in this example, since retained earnings are 'ring-fenced' by the proposals.

Oxera does not accept that retained earnings are 'ring-fenced' by the proposals, as the rate of return required to justify an investment using retained earnings is determined by the cost of equity (which faces the full impact of the tax). This result arises from the fact that the transaction tax affects the value of equity, and therefore affects the incentive for a company to invest using retained earnings just as much as the incentive to invest by issuing equity to investors. For example, if a firm decides to use retained earnings to build another factory (rather than pay this out to shareholders as a dividend), thereby doubling the firm's output, then (all else equal) this could be assumed to double the firm's share price. However, the introduction of the FTT will have reduced the share price, and hence a lower initial share price would be doubled. As a result, the investment from retained earnings would be worth less to shareholders with the FTT than without it. Alternatively, to look at this investment in terms of the returns needed, if, without the FTT, shareholders were indifferent between dividend payments and investment, they would, in the presence of the FTT, prefer dividend payments. In this example, the second factory does not get built.

Investment in small companies that currently do not have traded equity will still be affected because those companies typically have an expectation of being traded in the future; and to the extent that they do not have any expectations of trading, the value of the transactions will already have been excluded from the calculation by the adjustment for non-financial institution transactions.

This assumption is therefore not included in the alternative calculations presented below.

Bank lending

The Commission also assumes that the estimated impact on GDP should be reduced, since a significant fraction of corporate investment is funded through bank lending, which is not directly affected by the proposed tax. The Commission assumes that only one half of the impact on the cost of capital applies to the cost of bank lending to companies. The tax would affect the cost of bank lending indirectly, by affecting the cost of production and the cost of some sources of funding to the bank.

Oxera considered whether the Commission's assumption of a one-half effect is appropriate by considering the impact on a stylised bank based on a stylised balance sheet and impacts on the profit-and-loss account. The illustration, which is explained in Box 2.1, is theoretical, and considers a stylised bank that focuses on commercial and retail lending.

The illustration produces an estimate of the increase in the interest rate margin of bank lending to retail and corporate customers of 0.23%, which is approximately one-half of the assumed impact on the cost of equity of 0.4%. This would be broadly consistent with the Commission assumption of a one-half impact.

The Commission's economic impact assessment does not allow for changes in company financing behaviour due to this difference in the burden of the tax on bank lending relative to equity or retained earnings. In this review, Oxera did not focus on such potential behavioural changes, but did note in its previous work on the UK stamp duty that changes in incentives for company financing can produce unintended consequences for companies that are predominantly equity-financed (eg, small companies, innovative companies).

Box 2.1 Illustrative impact on a stylised bank

The stylised bank is assumed to take deposits primarily from, and lend to, retail and corporate customers, albeit with other functions typical of modern retail banking. Only certain elements of the cost of production are covered in this example, although it aims to capture the main issues.

The stylised balance sheet before and after the imposition of the FTT is presented in Table 2.1. The FTT is assumed to affect the balance sheet by:

– ending the bank's use of repos (see section 4.1 for an explanation for this assumption), which results in a reduction in the amount of government debt held in order to maintain the amount of cash available for liquidity purposes;
– reducing the amount of derivatives on both sides of the balance sheet, as a proportion of derivatives becomes unprofitable.

Table 2.1 Stylised bank balance sheet

	Before FTT	After FTT
Cash	100	100
Government debt	100	50
Loans to customers	600	600
Reverse repos	100	0
Derivatives (assets)	100	50
Assets total	**1,000**	**800**
Customer deposits	500	500
Wholesale funding	100	100
Repos	150	0
Derivatives (liabilities)	150	100
Equity	100	100
Liabilities total	**1,000**	**800**

Source: Oxera.

The impact on the interest rate margin (relative to the base rate) for bank lending depends on the profit-and-loss impact of these changes and the payment of the tax. It includes:

– an increase in the cost of equity for the banks;
– a reduction in the asset yield as the banks increase weight on highly liquid cash and reduce their holding of less liquid assets, such as government debt;
– tax payments on the remaining derivatives;
– a loss of revenue from the derivatives that no longer occur (which will be less than the tax revenue that would otherwise have been paid, or else the bank would not have stopped those derivatives);
– an increase in the wholesale funding cost as other banks face increased costs and the tax would be applied to some forms of funding.

Table 2.2 Profit and loss impacts

	Margin change	Asset/liability	P&L impact
Wholesale funding	+0.2%	100	–0.2
Derivatives lost	–0.1%	100	–0.1
Derivatives FTT	+0.01%	150 * 12 = 1,800	–0.18
Cost of equity	+0.40%	100	–0.4
Cost of liquidity	+1%	50	–0.5
Total			**–1.38**
Impact on margin	**+0.23%**	600	

Source: Oxera.

The illustrated impact on the cost of production of 1.38 is assumed to be passed on to customers, since these costs fall on all banks equally and the banks are assumed not to be the price-setters for the other assets or liabilities.[32] Given these assumptions, the interest rate margin on bank lending would increase by 0.23 percentage points in this illustration.

2.1.4 Overall long-run impact on GDP

Table 2.3 brings together all the Commission's adjustments for the impact of the proposed FTT on the GDP of the EU, for a 'closed-economy' model. The table compares these results with the adjustments made in this report, and provides a comparison of the resultant estimates of GDP.

The initial GDP impact of 1.76% is nearly doubled to 3.43% when a tax rate of 0.2% per trade is used rather than 0.1%.

The subsequent adjustments made by the Commission reduce its estimate of 1.76% of GDP to only 0.53% of GDP. In contrast, the reduced adjustments accepted in this report reduce the 3.43% of GDP to 2.42% of GDP. Overall, therefore, the estimated economic impact would be significantly more severe if the Commission's assumptions are adjusted to reflect more realistic scenarios described in this report.

There are many uncertainties surrounding what the economic impact of the proposed tax might be, and Oxera did not conduct its own independent impact assessment, which may have identified other effects not included in the Commission's assessment. However, Oxera's review of the impact assessment did find that the Commission's own macroeconomic model suggests that the impact will be greater than the Commission currently expects.

[32] Banks might alternatively be able to reduce the interest rate margin on customer deposits instead of raising the interest rate margin on loans.

Table 2.3 Summary of impact on GDP

	Commission impact assessment		Adjusted estimate
Economic model	**1.76% of GDP**	**Double effective tax rate**	**3.43% of GDP**
Primary market	–2.2%	Accept	–2.2%
Non-financial institution transaction	–15%	Accept	–15%
HFT transactions	–40%	Reject	0%
Company finance	–40%	Accept bank lending assumption	–15%
Final GDP impact	**0.53% of GDP**		**2.42% of GDP**

Note: The reduction for company finance is 40% in the Commission's assumptions, but is only 15% if the assumption on retained earnings is rejected (as described above). The 15% figure was calculated by Oxera using the Commission's remaining assumptions. The Commission assumes that 35% of company investment financing is done by debt and, of that 35%, some 85% is done by bank lending. As Oxera accepts the use of the one-half impact assumption for bank lending, the reduction in the economic impact is therefore 35% x 85% x 50%, which approximately equals 15%.
Source: Oxera.

It is helpful to put GDP impact estimates into context by comparing them with expected tax revenues. The Commission's central estimate of the revenue from the proposed tax, as presented in the economic impact assessment, is €37 billion per annum, which is about 0.3% of current annual EU GDP.[33] The Commission's central estimate of the revenue, as presented in its proposals (which Oxera understands reflects the final proposal for a tax that applies to both buyer and seller), is €57 billion per annum, which is about 0.45% of annual EU GDP.

A reduction in the level of economic activity would be expected to reduce government tax revenue, and this reduction can be estimated in the long term by assuming a fixed ratio of the tax burden to GDP. In most EU countries, total tax revenue tends to be around 40% of GDP,[34] and therefore one can assume that, in the long run, a reduction in annual GDP of 1% reduces annual tax revenue by 0.4% of annual GDP.

The Commission's estimate of the long-run impact on annual GDP is 0.53%, which could equate to a loss of general tax revenue of around 0.21% of annual GDP (based on current tax revenues being equivalent to around 40% of annual GDP), which is about €26 billion per annum based on current estimates of annual EU GDP. This means that, even based on the Commission's own assumptions, the tax would not appear efficient in collecting revenue, since over half of the €37 billion revenue (as estimated in the Commission's impact assessment) would be lost due to the negative impact on other tax sources.

The efficiency of the tax looks worse if some of the Commission's assumptions are adjusted to reflect more realistic scenarios accepted by this report. These scenarios suggest a negative impact in excess of 2% of GDP, resulting in a loss of general tax revenue of nearly 1% of GDP, which would be far greater than the Commission's estimate of expected tax revenue. At these levels of impact on GDP there is a risk that the imposition of the tax actually reduces total tax revenues from the economy. Given this risk, Oxera considers that the impact assessment would need to be significantly more thorough and based on more robust evidence before a well-informed decision could be made about the proposed FTT.

This estimate of poor efficiency of the tax in raising revenue comes before 'open-economy' considerations, which are discussed in section 2.2.

[33] The IMF estimates that the GDP of the EU in 2010 was approximately €12,300 billion.

[34] Oxera's assumption, based on a review of Eurostat data for tax revenues and GDP across Europe.

2.1.5 Short-run dynamics

All of the discussion of economic impacts has been for the 'long run', which in this context means once the negative impact on incentives to invest has finally fed through into the economy's stock of productive capacity. The Commission has noted that this could take 30 or 40 years, and therefore has suggested that the economic impact could be imperceptibly small because it is spread over such a long period of time.[35] It should be noted, however, that the Commission did not address in the impact assessment the issue of short-run dynamics or the amount of time that would constitute the 'long run'.

While it may be reasonable to assume that, in this context, the long run could be 40 years away, this does not suggest that the economic impact is spread evenly over that period. The impact of the tax on share prices (which are forward-looking indicators of expected asset values) would be much more immediate, and this would have immediate impacts on consumption and investment decisions, and hence GDP. For some economic shocks it is possible for there to be a significant impact even in the first few years, in addition to the annual long-run impact.

Oxera did not attempt to model the short-run dynamics of the tax, but notes that an initial negative impact may be expected through such a macroeconomic process.

2.2 Economic impact in an 'open economy'

The economic impact discussed above was for a 'closed economy', which does not consider how the impact changes when there are trading partners outside the EU without the proposed tax. Given the highly mobile nature of both capital and the financial services sector itself, consideration of the 'open economy' changes the potential economic impacts due to:

– options for investors and companies to avoid the tax;
– relocation of financial services to non-EU countries;
– capital flight to non-EU countries.

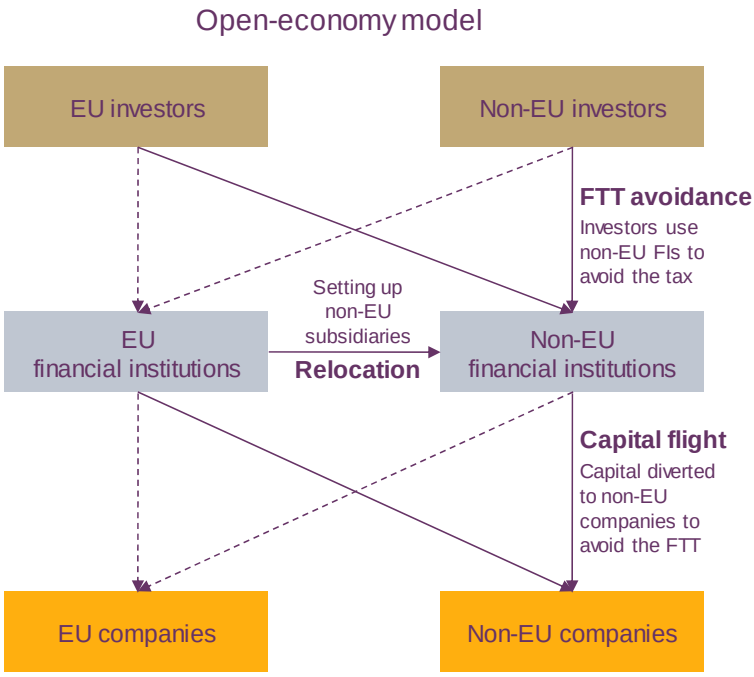
The report considers these impacts in turn. Before doing so, however, a conceptual framework for examining the open-economy impacts is considered.

2.2.1 Conceptual framework for open-economy impacts

Figure 2.2 provides a diagrammatic conceptual framework for considering open-economy impacts. Investors, financial institutions and companies can be either EU or non-EU, and the flow of capital from investors to companies can take different routes in response to the tax. Investors and companies are assumed to be fixed in their location, but financial institutions can relocate in response to the tax.

[35] Manfred Bergmann, European Commission's Directorate-General of Taxation and Customs Union, made this point at the Saïd Business School, Oxford, in the 'Taxing Banks' conference in October 2011. See http://www.sbs.ox.ac.uk/centres/tax/conferences/Pages/TaxingBanks.aspx.

Figure 2.2 Conceptual framework for an open economy

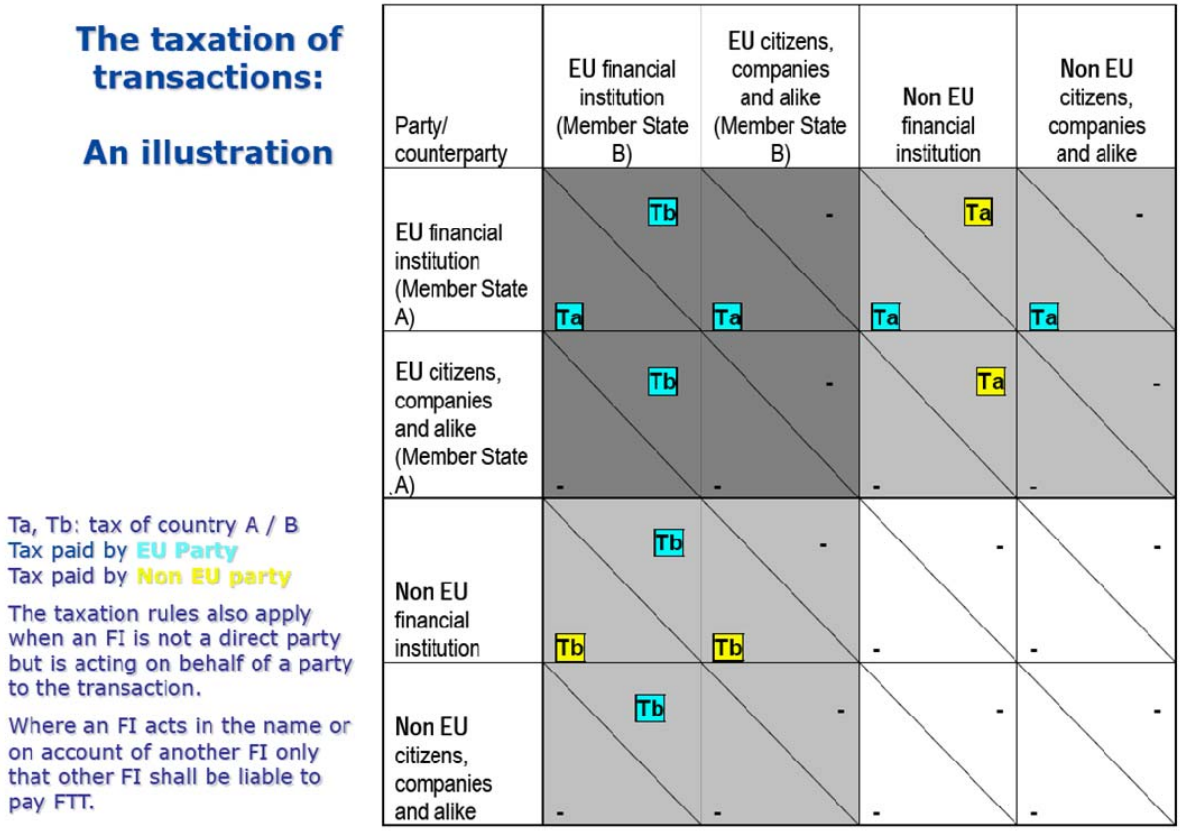


Source: Oxera.

The extent and nature of the impacts are dependent on the nature of the proposed tax—in particular, its legal incidence. The proposed tax is to be paid primarily by EU financial institutions (defined according to a 'residence principle'),[36] which must pay the tax whenever they are involved in a transaction, as either buyer or seller. The tax also applies, however, when an EU non-financial institution conducts a trade with the non-EU financial institution and, in theory at least, the non-EU financial institution is supposed to pay the (now extra-territorial) tax. Figure 2.3 replicates a diagrammatic illustration, produced by the Commission, of how the tax would be paid.

[36] See the impact assessment, for example, volume 1, p. 42.

Figure 2.3 Legal incidence of the proposed FTT



Source: European Commission presentation, slide 14, available at http://ec.europa.eu/taxation_customs/taxation/other_taxes/financial_sector/index_en.htm.

Based on this framework, Oxera considers the identified impacts to be as follows:

– the **tax can be avoided** by non-EU investors and companies using non-EU financial institutions rather than EU financial institutions. EU investors and companies may also be able to reduce their exposure to the tax by using non-EU financial institutions;

– this creates an incentive for EU financial institutions to **relocate** outside the EU;

– there is also an incentive for investors to favour non-EU companies ('capital flight') due to the imposition of the tax.

In its economic impact assessment, the Commission considers the impact of relocation on volumes of trading,[37] but not the economic impacts of relocation explicitly, and only refers to a study of the potential impact of capital flight (as noted below). The study considers each of these impacts in turn.

2.2.2 Options for investors and companies to avoid the tax

Non-EU investors have the option of trading with non-EU financial institutions that do not pay the tax or with EU financial institutions that do pay the tax. Similarly, non-EU companies can operate their hedging activities (involving derivatives) outside of the EU. The tax therefore creates a direct competitive disadvantage for EU financial institutions. While the tax does apply to EU investors and companies transacting with non-EU financial institutions, there is

[37] See the impact assessment, volume 1, p. 47.

still room for reducing exposure to the tax, since any 'cascading' trades by a non-EU financial institution are not taxed. This section considers each of these effects in turn.

There may also be options for avoiding the tax through the creation of new financial instruments that lie outside the remit of the (broad-based) tax proposals. Oxera did not, however, consider this possibility in this study.

Non-EU investors and companies

The proposed FTT is applied according to the residency principle for the parties involved in the transaction, not the nature of the financial instrument itself. Therefore, if two non-EU parties trade a security for an EU company, no tax is paid. The proposed tax is therefore unlike most equity stamp duties—such as the UK stamp duty, which applies the tax to the buyer in the transfer of ownership of the share, irrespective of the location of the buyer.

Therefore a non-EU investor or company wishing to buy an EU-based security would wish to trade with a non-EU financial institution in order to avoid the tax. For example:

– for over-the-counter (OTC) transactions, this would represent a significant competitive disadvantage for EU institutions, and it is possible that nearly all trade of this form with EU financial institutions could come to an end;

– transactions in the EU currently done primarily on exchanges (which is principally for equity securities) may be less likely to be lost if the clearing members are all based in the EU. However, with modern trading platforms, the risk of exchange trading shifting outside the EU is significant and growing.

EU investors and companies

The proposed FTT is designed with the aim of an EU investor or company having no preference between an EU and a non-EU financial institution, as the tax would apply equally in both cases. The proposals may not achieve this equality, however, for two reasons:

– the existence of a 'cascading' series of transactions that incur the tax;
– the practicalities of implementing an extra-territorial tax.

'Cascading' refers to the fact that many financial transactions involve more than one transaction, and can therefore incur the proposed FTT more than once. The Commission's proposals made a limited attempt to address this issue, but it remains the case that in many examples numerous related transactions would result in the ultimate tax burden of a transaction being higher than the tax rate proposed by the Commission. Box 2.2 below provides examples of cascading transactions to highlight this issue.

In this context, the existence of cascading transactions incentivises the EU investor to trade with a non-EU financial institution, in which case all the cascading transactions will take place outside the EU and will therefore not incur the tax. The EU investor then faces only the initial occurrence of the tax.

There could also be an incentive for EU investors to trade with non-EU financial institutions if, in practice, the tax cannot be effectively collected from either non-financial customers or non-EU financial institutions. Multi-national companies, for example, can relocate their corporate treasury functions outside of the EU in order to avoid the tax falling on hedging activities. Oxera did not look at this issue in detail, but notes that the Commission is hoping to develop a tax that can be collected with a relatively low administration cost, as it is collected from financial institutions rather than from every company and individual investor.

Box 2.2 Cascading financial transactions

When an investor purchases securities on the stock exchange there is typically not just one transaction, but a series of related transactions that ultimately deliver the stock from one investor ('investor S') looking to sell to another investor looking to buy ('investor B').[38] For example, the security may pass from investor S to its broker and then to the clearing member (if the broker is not a clearing member or not used as clearer by the investor), then from the central counterparty to the next clearing member then to the broker of investor B and then to investor B.[39] This is an example of a cascading series of financial transactions arising from several intermediary transactions. In practice, the chain of transactions may be even longer—for example, if the broker of investor S and the broker of investor B sell and buy via other brokers and/or market-makers.

With UK stamp duty, for instance, all these intermediary transactions are exempt from the tax. The Commission did also recognise that there are intermediary transactions, since it states that the tax should not apply to central counterparties (CCPs),[40] but these do not offer explicit exemptions for brokers and clearing members as the UK stamp duty does.

In addition, with the broad scope of the proposed FTT, many other situations of 'cascading' transactions arise. For example:

– portfolios of government bonds often include related derivatives such as credit default swaps, currency hedging and interest rate hedging;

– fixed-rate mortgages involve derivatives that allow the mortgage provider to hedge the interest rate risk. This typically involves a series of regularly renewed derivatives, creating a cascading effect with the FTT;

– retail investments with capital guarantees involve derivatives such as put options to limit any loss of capital;

– stock-lending by pension funds, which boosts their returns, involves numerous transactions as stock is passed to investment banks then hedge funds, which in turn engage in numerous derivative positions to hedge various risks;

– repos by banks to improve their liquidity involve frequently renewed transactions (see section 4.1);

– options, where the issuing banks may need to manage their positions in underlying assets for risk management purposes, intra-group transfers may be required (which are taxable), opposite derivative positions may be required, as well as currency and interest rate hedges. Options are often renewed frequently—each renewal triggers another tax payment.

With these cascading transactions, the effective tax burden is ultimately higher than might be expected based on the direct tax rate for the initial transaction. Section 3 provides an illustration of the extent of the burden for a retail investment product.

2.2.3 Relocation of financial services activity

The above incentives for investors to use non-EU financial institutions create an incentive to relocate some financial services activity outside of the EU. Activities that could avoid tax by moving overseas include:

– OTC trades;
– fund management (and most subsequent trading done by the fund manager—in particular OTC and exchange trading, insofar as the equities are traded on exchanges outside the EU);

[38] For a description and analysis of the value chain for trading and post-trading services for equity transactions, see Oxera 'Trading and post-trading price monitoring study', July 2009, available from the website: http://www.oxera.com.
[39] The Commission's proposal states that CCPs would be exempt from the tax.
[40] See the Commission's proposal, p. 15.

– exchange trading, to the extent that modern technology allows mobility;
– market-making activities, to the extent that they are caught by the tax.

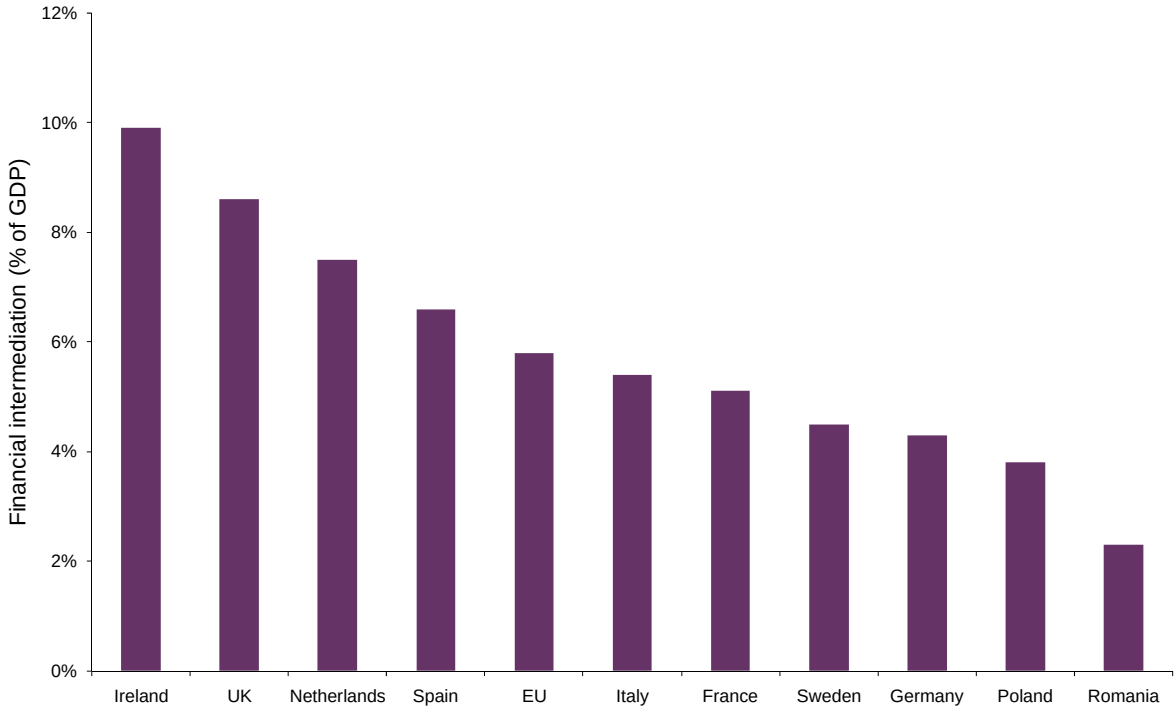
The relocation of financial services activity overseas can have a negative impact on GDP because a service that was once provided domestically now becomes an import for the EU.

The extent to which financial institutions might choose to relocate outside the EU is uncertain, however, and as the Commission explains in its impact assessment the evidence on the threat of relocation is mixed.[41] The experience of Sweden in the late 1980s and early 1990s was one of significant relocation, but evidence on relocation is much less clear-cut in other examples.

The impact of any relocation of financial services activity is likely to vary considerably between EU Member States because the importance of the financial services sector varies considerably. The extent to which different Member States may be exposed can be indicated by the importance of financial intermediation for GDP (see Figure 2.4), although this percentage depends on the degree of sophistication of financial services and imports and exports of services, as well as the degree of trading-related activities.

The highest proportion in the EU is for Luxembourg (excluded from the figure), at 24% of GDP; however, in terms of the absolute number of jobs, the UK would be the economy most exposed to this negative impact.

Figure 2.4 Financial services sector as a proportion of GDP



Source: Eurostat.

Relocation of financial services activity could have an offsetting benefit for the EU economy, since it would be likely to reduce the cost of capital impact estimated for the closed economy. To the extent that investors are able to invest in EU companies without incurring the tax, since they use non-EU financial institutions, this would reduce the negative impact on the cost of capital and hence lessen the negative impact on the wider economy. At the same

[41] See section 3.1.4 of Volume 1 of the impact assessment for a summary of the Swedish experience, where an FTT caused significant relocation. See also Volume 9 of the impact assessment.

time, it would also reduce the revenue collected by the tax, which underlines the relationship between the effectiveness of the tax in collecting revenue and the impact on the economy, as discussed further below.

2.2.4 Capital flight

In addition to the incentive for financial services activity to move outside the EU to avoid the tax, there may be an incentive for investors to invest in non-EU companies to avoid the tax. This latter risk would represent capital flight away from the EU, which would have negative implications for the wider economy through reduced investment in the EU.

The extent of capital flight depends on the effectiveness of the proposed FTT in taxing investment into EU companies. The analysis above suggests that it would be possible for non-EU investors to avoid the tax to some extent even when investing in EU companies. This is because the tax applies to the location of the party involved in the transaction, not the location of the underlying asset. If this is the case to a large extent then little capital flight would be expected since there would be little additional incentive to invest in non-EU companies over EU companies. However, it would seem unlikely that investors can fully avoid the tax in this way owing to the localised nature of some trading, particularly for equities. EU-based national stock exchanges provide efficient and liquid transactions in EU equity which cannot easily be replicated through OTC transactions among non-EU financial institutions. The extent to which trading in equity can move outside the EU is unclear, but it is likely that, for localised and less liquid equity securities, there would be difficulties in relocating and hence the tax would still apply.

This would create incentives for investors to favour non-EU equity over EU equity, and hence cause capital flight outside of the EU. This could potentially change investment location decisions and apply more pressure on companies to pay for the tax in terms of increases in the cost of capital, rather than in investors taking a lower (net) return on their investments. This would be the opposite of the offsetting effect noted at the end of section 2.2.3.

At the end of volume 16 of the impact assessment, the Commission refers to work by academics, Chisari, Estache and Nicodeme, on a general equilibrium model that allows for capital flight.[42] The preliminary results referred to by the Commission are significant—in particular it notes that, 'For the FTT, even a mild international mobility dramatically amplifies the negative effects [on GDP], which almost triple.' As this work has not been published, Oxera cannot comment on its importance, but does note that this increased impact from capital flight is significant and would surely warrant further investigation by any tax authority considering the imposition of an FTT.

In summary, taking all the above considerations into account, Oxera concludes that it would be appropriate to assume at this stage that significant capital flight could make the economic impact at least as severe as that predicted by the closed-economy model. Oxera has not seen strong evidence (given the lack of detail for the aforementioned study by Chisari, Estache and Nicodeme) that the economic impact would be significantly greater.

2.2.5 Overall economic impact with an open economy

Given the uncertainty in the possible extent of relocation, Oxera considered open-economy impacts in terms of two different scenarios for the economic impact relative to that discussed for the closed economy, depending on the effectiveness of the proposed FTT in collecting tax revenue. In summary, the two scenarios are as follows.

1. The proposed FTT is ineffective in collecting tax revenues as financial services activity relocates outside of the EU and investors are able to invest in EU companies without incurring much tax. In this case, there is a significant loss of financial services activity (particularly for countries such as Luxembourg and the UK), but the wider economic

[42] See the impact assessment, volume 16, p. 56.

impact is **less severe than predicted by the closed-economy model** because the tax burden on investors is less.

2. The proposed FTT is effective in collecting tax revenues, since financial services are either unable to relocate overseas, or doing so does not help to avoid the tax when investing in EU companies. In this case, **the economic impact is at least as severe as in the closed economy**. In addition, however, there may be other effects that operate through international competitiveness that directs new investment away from the EU and/or EU companies and further depresses the EU economy compared with the rest of the world.

In both scenarios, however, the (net) revenue collected by the proposed FTT is likely to be poor, since in the first scenario the collection of revenue is ineffective and tax revenue is lost from the relocation out of the eurozone of financial services activity, while in the second scenario the large negative impact on GDP significantly affects the collection of other taxes.

2.2.6 Eurozone FTT

There has been some discussion of the possibility of a financial transaction tax for the eurozone countries alone, if non-eurozone EU countries are resistant to the proposals.

The economic impact of the proposed tax on the countries that adopt the tax will be similar for a eurozone tax as considered in this report for an EU-wide tax, although the threat of relocation is likely to be more severe for a eurozone tax given the importance of London as an international financial centre.

Financial institutions in London and other non-eurozone EU financial centres would be affected by a eurozone FTT; however, since their transactions with eurozone customers would be subject to the tax. Further analysis would be required to ascertain what the overall impact on non-eurozone EU countries would be from a eurozone tax.

3 Economic incidence

The Commission makes it clear that one of the prime objectives for the proposed FTT is to make the financial services sector pay increased tax towards the funding of EU governments, particularly given the cost of the recent financial crisis. However, the Commission itself acknowledges that 'a large part of the burden would fall on direct and indirect owners of traded financial instruments.'[43] The broad definition of financial services used, which is likely to capture many firms that are not typically considered as financial services—since the definition includes 'all the enterprises conducting more than a certain threshold of financial activities'[44]—makes it clear that the primary burden of the tax is on investors and businesses.

In this section, Oxera considers where the economic incidence of the tax is likely to fall and what the extent of the tax burden might be for different types of financial product, with three illustrations to provide further clarity: the impact on a pension fund, the impact on a retail investment fund, and the impact on corporate hedging.

3.1 Conceptual basis for the economic incidence

Financial services companies that are providing services to their customers that involve transactions would have to pay the proposed FTT, but this does not mean that they will bear the burden of the tax. The cost of the tax can be passed on to their customers—the extent to which this occurs depends on the coverage of the tax, the nature of competition for the services, and the consequent price elasticities of demand and supply facing the companies. For example, it is typically assumed that an increase in a tax applied across the board in a highly competitive industry tends to be passed on to consumers to a large extent, since it affects all companies equally and competition between providers means that they cannot afford to absorb the tax because their margins are slim. Companies can pass on the tax because all their competitors are doing so.

This would also be the case with the FTT and relatively standard services such as stock-broking. The FTT would affect all stockbrokers and competition between them means that they do not have a monopolistic position enabling them to absorb the tax.[45]

This logic also applies to related cascading transactions that form part of a financial activity. For example, the tax on derivatives required to deliver a fixed-rate mortgage would be passed on to the mortgage holder for the same reasons as a tax applied across the board in a highly competitive industry is passed on to customers.

The same logic would suggest that it is ultimately the investors and businesses that pay the tax, not the trader. The Commission, in its impact assessment, does not provide evidence to suggest that traders will absorb the cost of the tax; it simply models the tax as an increase in transaction costs.

Clearly, there is a trade-off between the tax falling on investors through lower (post-tax) returns and falling on companies by needing to provide higher (pre-tax) returns to compensate investors. The burden of the tax will be shared between end-investors and

[43] See the impact assessment, volume 1, p. 53.

[44] See the impact assessment, volume 1, p. 43.

[45] It may be possible that, for less common, niche financial services, providers have a monopolistic position—perhaps due to financial innovation or brand loyalty—that enables them to absorb some of the tax. In textbook economic theory, a perfect monopolist would absorb half of the tax and pass on the other half to customers.

companies, with the split dependent on the extent to which end-investors can invest in untaxed investment as a substitute for investing in taxed investments. In practical terms, this means the extent to which investors would be likely to switch to investments that would still be affected by the tax but to a lesser extent than directly affected EU securities, such as:

– bank savings deposits, which would be affected by the tax due to the impact on the cost of production for banks, but to a lesser extent than directly affected investments;
– non-EU investments, which would be directly taxed as EU investors are involved, but perhaps less than EU investments since any related cascading transactions would take place outside the EU and would not be taxed.

If investors can shift to other investments that face a lower burden of tax then EU companies will be forced to raise the rates of return offered by their investment opportunities in order to attract investment. This dynamic is captured in the Commission's impact assessment economic model as investors have the choice between riskless government debt (untaxed) and company equity (taxed). The model's focus is on the impact on the required rates of return for corporate equity resulting from investors' choice between these two investments.

Ultimately, the tax falls on wider society whichever route it takes, hitting either investors and pension funds, or consumers through the higher prices that companies are forced to charge to cover the increased cost of capital.

In this section, Oxera looks at the burden from the opposite perspective—the impact on investor returns if they must bear the burden of the tax. In the illustrations that follow, Oxera estimates the tax burden for three financial services products: a pension fund; a retail investment with a capital guarantee; and corporate currency hedging for risk management purposes. It is assumed in these examples that the tax burden is passed on to the investor.

3.2 Illustrations of the tax burden

Three examples of financial products were chosen to gain a better understanding of how the tax would affect retail investors and companies, including one example that focuses on the long-term returns from investment (pension fund), another that focuses on cascading effects when derivatives are involved (retail investment with capital guarantee), and a corporate example for the cost of risk management procedures.

3.2.1 Pension fund

To illustrate the potential impact of the proposed tax on the returns from a pension fund, Oxera considered the possible burden of the tax on a pension saver for an illustrative pension fund. The impact will depend on specific circumstances (such as the velocity of trading, and the extent of use of derivatives), which will vary between funds and would be likely to change following the imposition of an FTT. However, it may be useful to consider the potential impact for an illustrative fund with the following assumptions:

– the saver invests in the pension fund for 40 years before retiring and claiming their pension;

– the tax is passed on to the pensioner in full as the managers of the pension fund are not able to absorb the tax; trading and post-trading costs are typically directly borne by the fund rather than the fund manager;

– the pension fund has a balanced portfolio, in which the value of the fund is equally split between UK equities, overseas equities and bonds;

– 'life-styling' of assets begins five years from the end of the accumulation phase;

– the pension fund adopts a mixture of active and passive strategies consistent with allocations observed in the market. The assumed velocity of trading for each asset class is 43% for UK equities; 55% for overseas equities; and 68% for bond trading;[46]

– the annual management charge is 0.3% and the trading cost associated with bond trading is 0.54% and for equities 0.5%.

These assumptions are consistent with the approach taken by Oxera in 2006 to analyse UK stamp duty, with the assumptions on the velocity of trading being based on actual data collected at that time.

Table 3.1 presents the results of the analysis, and shows the impact on the annual returns as well as the percentage impact on the final retirement fund. Results are presented for the direct impact of the FTT on the pension fund, as well as the potential impact, given cascading effects.

Possible 'cascading' effects are considered due to intermediary trades and any associated derivatives being taxed, although the extent to which this might happen is uncertain. During the study, several different estimates of the potential extent of cascading effects were considered—here, a simple assumption that cascading doubles the number of taxed transactions is used.

The analysis does not include any potential losses from other activities that would become uneconomical with the tax, such as stock-lending activities that boost yields for pension funds.

In summary, the analysis shows that, for a pension worth €10,000 per year, the direct impact of the tax would reduce the annual income by €273. This impact could be doubled by cascading effects.

Table 3.1 Impact on returns of a pension fund

Illustration	FTT (direct)	FTT (cascade)
Reduction in annual returns	0.11%	0.22%
Impact on retirement fund value	2.73%	5.46%

Source: Oxera.

3.2.2 Retail investment

In this example, a retail investment in a FTSE 100 tracker fund with a minimum guaranteed return is considered. The fund guarantees that its final value will never be less than 80% of the investor's initial capital, which it provides by purchasing put options. The example is based on the following assumptions:

– the retail investor buys the fund and then sells it after one year;

– the expected return on the fund before the tax is assumed to be 5%;

– the FTSE 100 tracker involves trading of equity in line with the assumptions used for funds in the pension fund example above;

– the put option is renewed every month;

– the price of the put option also reflects any tax payable by associated transactions;

[46] This portfolio split is based on observations on the market within UBS (2006), 'Pensions Fund Indicators 2006', May, UBS Global Asset Management.

– the analysis does not at this stage consider behavioural responses that would be likely to reduce the cost of the tax—although these are considered below.

Table 3.2 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 direct tax on the transactions when the fund is bought and sold (0.1% tax on both transactions);

– 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).

The FTT in this example reduces the expected return from the fund from 5% to 4.2%. 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 for a social point of view, however, as it would increase risk exposure.

Companies offering the type of fund in this illustration would be likely to alter their behaviour in order to reduce the cost of the tax—for example, by following the FTSE 100 index less closely and by buying longer-dated options. Such changes in trading behaviour would reduce the burden of the tax and hence lessen the impact on the rate of return estimated here. However, these changes would also have associated costs in terms of delivering a less accurate tracker with less flexibility over time.

Table 3.2 Expected return on a retail investment

Illustration	Return on investment
Expected return	**5%**
FTT on purchase/sale of fund	–0.2%
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	**4.2%**

Source: Oxera.

This illustration also assumes that all the burden of the tax falls on investors (through lower post-tax returns) rather than companies (through higher pre-tax returns). This illustration is instructive, however, as it shows how the burden of the tax can be material with cascading transactions and associated derivatives.

3.2.3 Corporate hedging activities

Non-financial companies, particularly those with a focus on exports, will have treasuries that are involved in a range of risk management procedures through the purchase of derivatives. These activities can include:

– foreign-exchange hedging, due to receipt of payment in foreign currency;

– interest-rate hedging, to manage exposure to changes in interest rates;

– counterparty-credit risk, as large credit levels may occur with trading partners;

– commodity price hedges, as input prices are volatile.

In addition, corporate pension funds may involve a range of derivative transactions.

As an illustration, Oxera considered a large car manufacturer exporting €1m of cars to the USA. The manufacturer is considered to be a financial institution itself due to the extent of hedging it does, and so the effective tax rate is 0.02% for derivatives. The following hedging activities would be subject to tax.

– Payment is agreed 12 months before delivery, so a currency hedge is taken out. A change in the delivery date means that this hedge has to be revised to reflect the new date, incurring the tax again (FTT = €1m x 2 x 0.02% = €400).

– Short-run debt to purchase the input materials (assumed to be half the value of the output) requires interest rate hedges (FTT = €0.5m x 0.02% = €100).

– Naked credit default swap on €1m of counterparty's shares bought to provide insurance against default (FTT = €1m x 0.02% = €200).

– Commodity price hedges for the input commodities (assumed to be two-tenths of the value of the output) (FTT = €200k x 0.02% = €40).

In this illustration, the total cost of derivatives would be €740. For a manufacturer making a 10% margin, this would represent a 0.74% reduction in profits.

This increase in costs may not be large enough to deter such an exporter from undertaking hedging for risk management purposes, but might well be sufficient to encourage international manufacturers to relocate their hedging activities to outside the EU (to avoid the tax).

4 Further unintended consequences

The proposed FTT would be likely to have other significant consequences for the EU economy that are much more difficult to quantify. Oxera considered a wide range of implications and focused on a small selection that could be described as 'unintended consequences', since the impacts were not identified in the Commission's impact assessment and would not be likely to be seen as beneficial by the Commission (or other commentators for that matter). These consequences are too uncertain to be quantified in terms of their impact on GDP. Oxera therefore explains the possible impact in qualitative terms.

The unintended consequences considered here are:

– an impact on liquidity in the banking sector;
– disincentives for risk management;
– disincentives for holding EU government debt.

To understand the impact of an FTT, these effects would need to be analysed in more detail, and quantified where possible. This section identifies some of the possible unintended consequences. A full assessment and quantification is beyond the scope of the section.

4.1 Impact on liquidity in the banking sector

One of the potential consequences of the proposed FTT that was brought to the attention of Oxera in discussions with banks was the impact on the economics of repos, and the consequent impact on the liquidity of banking assets and the cost of banking.

Repos are repurchase agreements where a bank sells assets to another financial institution with an agreement to repurchase the assets at an agreed price after a (usually quite short) period of time. Repos are economically similar to a secured loan with the asset being the collateral. Banks use repos to provide liquidity—they can sell less liquid assets quickly to provide cash, with the reassurance of repurchasing the asset shortly afterwards at a pre-agreed price. This allows banks to hold more illiquid, but higher-yield, assets, rather than low-yield cash, as they know they can access cash if required.

The scale of the use of repos by banks is large: the total volume of repos outstanding in June 2011 in Europe was estimated by the International Capital Markets Association (ICMA) to have been about €6 trillion, and much of this volume was issued by EU banks[47]. Repos involve transactions in securities between two financial institutions, and would therefore be taxed at 0.2% of the value of the securities at both the beginning and the end of the contract.

Using repos to access liquidity is likely to become uneconomic with a tax of 0.2% on each side of the trade. A less liquid security that offers a yield that is one percentage point higher than cash could be sold and repurchased only two-and-a-half times per year, whereas current repo activity is typically much more frequent than that, according to the banks Oxera interviewed.

[47] See the ICMA European repo market survey number 21, conducted June 2011, available from their website: http://www.icmagroup.org.

It is therefore possible that banks would use repos much less with the tax imposed, and would therefore hold more cash rather than less liquid assets. Bank holdings of many securities, including government debt, would be discouraged.

In section 4.3, Oxera returns to the important issue of disincentives to holding government debt.

4.2 Disincentives for risk management

As illustrated in section 3.2.3 above, 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. Risk management procedures of these kinds 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.

While the cost of the tax for an individual derivative appears relatively low, as the rate of tax is proposed at only 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, as indicated in section 3.2.3.

4.3 Disincentives for holding EU government debt

In the course of the study, Oxera noted a number of reasons why the proposed FTT would discourage investors and, in particular, banks from holding EU government debt:

– the application of the tax in the secondary market for government bonds increases the rate of return required by investors (just as it does for the cost of capital), although one may expect this increase to be offset somewhat by relocation of bond trading activity to outside the EU;

– the increased cost of repos encourages banks to hold more cash and less government debt (see section 4.1 above);

– the increased cost of associated derivatives (including credit default swaps, and currency and interest rate hedging) effectively raises the cost of investing in government debt, and therefore increases the required rate of return.

The impact of the proposed FTT on the cost of debt therefore depends on the degree to which trading can avoid the tax by moving outside the EU and the extent to which the debt is held by non-bank investors.

5 Conclusions

The proposed FTT is likely to have a significant and highly uncertain negative impact on the economy of the EU—not just for international financial centres such as London but for all business and investors in the EU. The Commission's economic impact assessment already finds a significant negative impact, yet Oxera's review suggests that the negative economic impact is likely to be larger even than the Commission expects (or, alternatively, the revenue raised by the tax will be much lower). With the additional uncertainty of financial services relocation and capital flight outside of the EU as well as 'unintended consequences', the overall likelihood of the proposed tax increasing total net tax revenues of EU governments is uncertain.

In this context, Oxera would suggest that it would be important for EU tax authorities to examine further the potential economic impact before any rational decision can be made on the proposed FTT.

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