

# THE IMPACT OF THE EU-11 FINANCIAL TRANSACTION TAX ON END-USERS

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## REPORT QUALIFICATIONS/ASSUMPTIONS & LIMITING CONDITIONS

Oliver Wyman was commissioned by the Association for Financial Markets in Europe (AFME) to evaluate the impact of the European Union's proposed FTT on European end-users. The report draws on transparent data sources and applies methodologies supported by existing empirical studies. Additionally, over 30 market participants were interviewed in the preparation of this report, including long-term investors, corporate treasurers, and primary and secondary dealers.

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# ABSTRACT

This report assesses the impact of the proposed EU financial transaction tax (FTT) on end-users. The analysis is based on transparent data sources, methodologies supported by existing studies, and a series of interviews with both dealers and end users. While end users are not the intended targets of the tax, we find that they are likely to bear heavy costs and that these have been underestimated to date. These effects will have implications for the real economy and reduce the income generated by long term savings and corporate investments.

In particular, we believe two effects have been underestimated:

- Cascading taxes paid in the financial system are too large to be absorbed by the financial system and so would in large part be passed on to end users
- Reduced liquidity in the system would increase transaction costs for end-users

We estimate an annual cash-flow drag of €30–50 BN resulting from the tax, which would be realised in three different ways:

- Securities issued by EU-11 entities would fall in value as expected future cash-flows from the securities decline, imposing losses on holders of those securities
- EU-11 corporates and governments would find future fund-raising through the capital markets more expensive, as a result of these lower valuations
- All parties would find it more expensive to manage financial risks, such as interest rate and currency risks on an on-going basis

These effects would have material costs on end-users:

- Corporates would face annual costs of €8–10 BN, equivalent to 4–5% of post-tax profits in the impacted economies
- Governments would face annual costs of €15–20 BN, equivalent to ~1% of their annual debt issuance
- Investors would face a one-off decline in the value of their investments of 4–5% (equivalent to a €260–340 BN decline in asset values). Additionally, they will face annual costs of €5–15 BN in increased risk management costs

There would also likely be material second order effects in the bank funding markets, on monetary policy transmission, and on the competitiveness of EU-11 banks in derivative markets and corporate banking. We have not quantified these second order effects in this study.

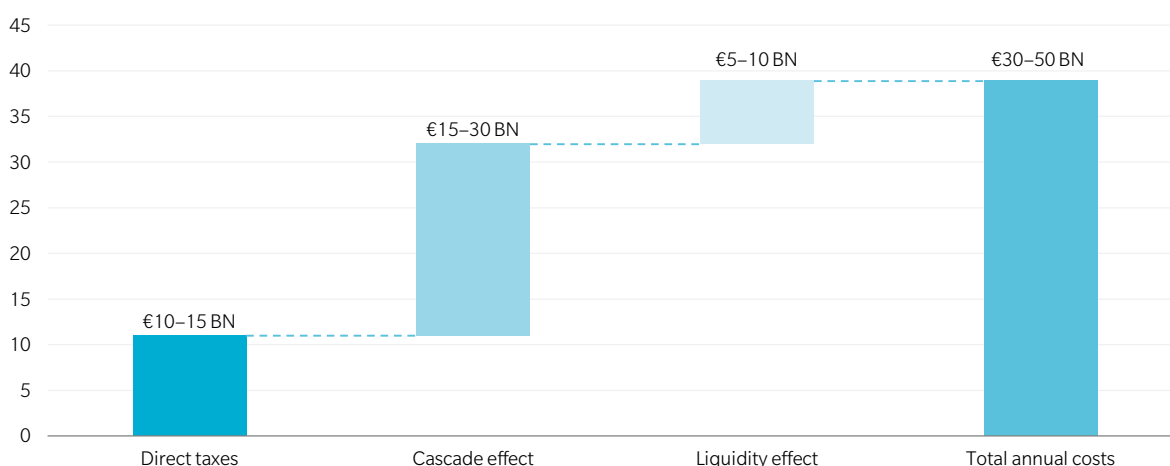
# SUMMARY FINDINGS

## IMPACT OF THE TAX ON END-USERS

This report assesses the impact of the proposed EU financial transaction tax on end-users, such as long term investors, governments and corporations. The proposed tax would apply in 11 EU nations (the “EU-11”<sup>1</sup>) and would apply to all transactions made by EU-11 financial institutions, and all transactions involving securities issued by EU-11 entities. The tax is proposed for introduction in mid-2014.

We estimate total costs to end users of €30–50 BN per annum of three broad types:

EXHIBIT 1: ANNUAL IMPACT ON END-USERS (€BN)



Source: Oliver Wyman analysis

- **Direct taxes:** End users will directly pay €10–15 BN. The tax will be paid by long term investors, such as pension funds, insurers, and asset managers, who will continue to need to trade periodically to manage their investments and risks. The tax applies only to financial institutions, so corporations and governments would not pay the tax directly themselves
- **Cascade effect:** A further €15–30 BN reflects taxes paid by dealers but passed on to end users through wider bid-ask spreads. The proposed tax rate (1 basis point for derivatives, 10 basis points for other products) is a multiple of current spreads in most markets. So only a fraction of the tax could be absorbed by dealers themselves. The vast majority would be passed on to end users
- **Liquidity effect:** A further €5–10 BN reflects higher transactional costs as bid-offer spreads increase in response to reduced volumes and lower liquidity. There is strong empirical evidence that reduced trading volumes are associated with increased bid-offer spreads, representing further increased transaction costs for end users

<sup>1</sup> Austria, Belgium, Estonia, France, Germany, Greece, Italy, Portugal, Slovakia, Slovenia and Spain

## CASCADE EFFECT – DEALER TAXES MUST BE PASSED ON

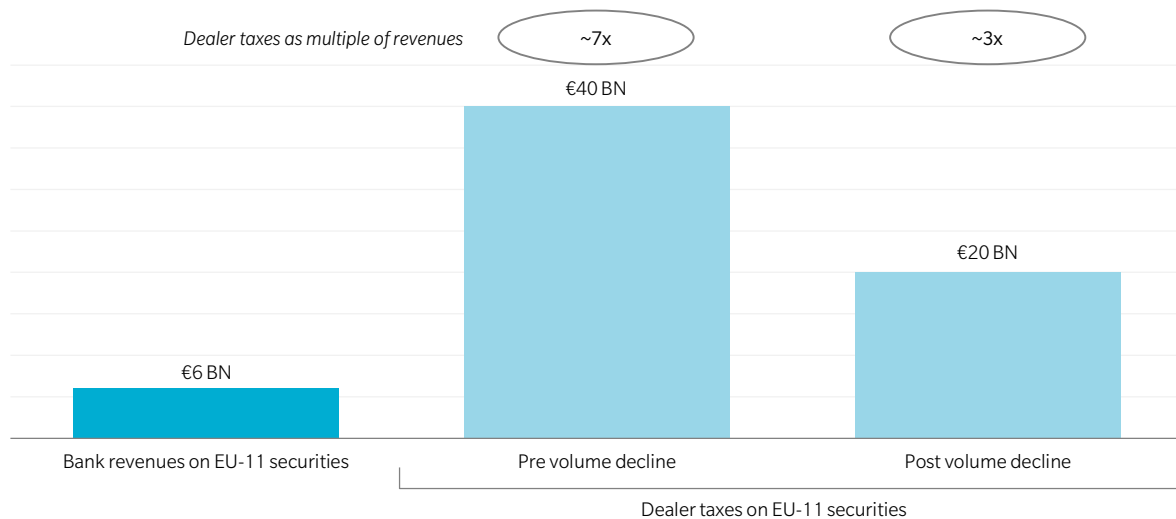
A key element of our argument is that end clients would face not only the costs of the tax they pay themselves, but also a “cascade effect” as taxes paid on associated trades amongst financial intermediaries are passed on. This effect is important: the cost to end clients of the cascade effect is significantly larger than the taxes they pay directly themselves.

The cascade effect is so large because for every given end-user trade there are typically several associated trades between dealers and other intermediaries, each of which will be taxed. These associated trades are vital to facilitate client business and manage risk. For instance, a dealer that buys securities from a client may need to make multiple smaller trades with other clients or dealers in order to sell the securities and avoid accumulating large risk exposures. So, although we anticipate a sharp reduction in traded volumes in response to the tax – and, in particular, a sharp decline in non-end-user trades – a significant proportion of this activity will continue because it is a vital element of a functioning securities market.

As the proposed tax rate is a multiple of current bid-ask spreads in many markets, the tax cannot be absorbed within the existing spread. For example, in equities markets the 20bps tax<sup>2</sup> compares to bid-ask spreads of less than 5bps for large cap stocks.

Another way to think about this is to compare the total revenues generated by dealers in market-making EU-11 securities to the tax they would be asked to pay on that activity. Exhibit 2 shows this analysis for EU-11 debt and equity securities. The dealer tax would be seven times greater than current market-making revenues for equity and debt securities. Taking into account the large-scale reduction in volumes traded we anticipate as a result of the tax, the tax paid halves, but remains three times the current dealer revenue base.

### EXHIBIT 2: DEALER REVENUES VS. MARKET-MAKER TAXES ON EU-11 ISSUED SECURITIES



Note: Bank revenues and taxes refer to EU-11 issued securities only (e.g. under the issuance principle). Market-maker taxes shown pre volume declines for comparability to 2012 revenue base. Excludes revenues and taxes on non EU-11 issued securities (e.g. under the residence principle).

Source: Oliver Wyman proprietary data and analysis

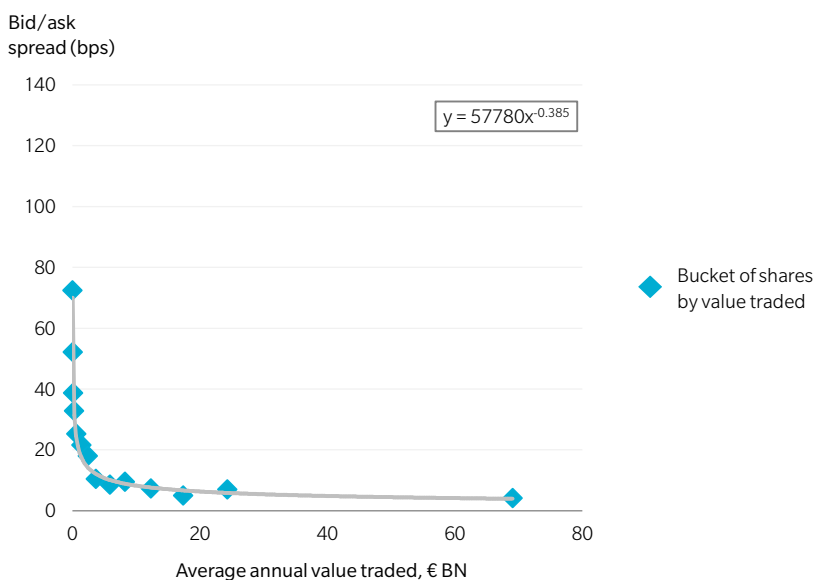
<sup>2</sup> Two-sided (e.g. where a transaction involves two eligible counterparties)

## LIQUIDITY EFFECT – LOWER VOLUMES WOULD DRIVE UP TRANSACTION COSTS

End-users will also have to pay the higher transaction costs that result from lower volumes in the market. Currently market-makers provide liquidity to the market by trading frequently at low margins, making it easier for dealers to rapidly match buyers and sellers. The FTT would make much of this activity unprofitable and drive a dramatic reduction in volumes and liquidity.

A less liquid market requires more risk-taking by market-makers, since it requires larger inventories and longer holding periods. This means increased capital costs for dealers, which in turn drives wider spreads. Indeed a strong inverse relationship between trading volumes and bid-ask spreads can be empirically observed both within and across markets. Exhibit 3 shows an example of this relationship for EU-11 equities.

**EXHIBIT 3: LOWER TRADING VOLUMES ARE ASSOCIATED WITH HIGHER BID/ASK SPREADS**  
OBSERVED RELATIONSHIP BETWEEN BID/ASK SPREADS AND TRADED VOLUME FOR EU-11 STOCKS



Source: Trading Venues, Thomson Reuters, BofAML analysis, Oliver Wyman analysis

The impact of the tax varies across asset classes, reflecting differences in market size and structure.

- Cash equity markets are typically traded on exchange and generally exhibit narrow spreads. While liquidity effects will be large for some thinly traded stocks, for the market overall the primary impact of the tax will be through the “cascade effect”, even under more extreme volume reduction assumptions
- Government bond markets are large and highly liquid, turning over about three times a year. The market is supported by principal market-making and is highly connected to other markets, such as the repo and derivatives markets. Because it is unclear how the FTT will affect a market so dependent on principal market-making, our modelling accounts for two scenarios: a large volume decline, which implies a large liquidity effect and much smaller cascade effect, and a small volume decline, which implies a small liquidity effect but a large cascade effect
- Corporate bond markets are characterised by lower liquidity, reflecting greater heterogeneity of instruments (companies issue a range of debt instruments of differing tenors and structures) and buy-and-hold behaviour amongst investors. Therefore the primary impact is through the liquidity effect
- Derivative markets will see a more moderate effect on spreads but a profound effect on competitive dynamics. We believe the “issuance principle” would not apply to OTC derivative contracts, such as a Euro interest rate swaps, meaning that non-EU 11 banks would be exempt from the tax. This would create an insurmountable competitive disadvantage in market making for EU-11 banks, and this activity would migrate to non-EU-11 banks. The losses for EU-11 banks would exceed the forgone market making income because providing OTC derivatives are an important part of the offering with which they win broader banking relationships from corporate customers

#### EXHIBIT 4: KEY STRUCTURAL DIFFERENCES ACROSS ASSET CLASSES

	Cash equities	Government bonds	Corporate bonds	FX and interest rate derivatives
Size: Current volumes	€8 TN	€18 TN	€460 BN	€50 TN <sup>3</sup>
Liquidity: Average annual trading velocity	2.2x	3.1x	0.6x	21x (FX) 1.4x (IRD)
Typical bid-ask spreads <sup>4</sup>	10bps	15bps	40bps (IG) 90bps (HY)	0.04bps (FX fwds) 2.5bps (IRS)

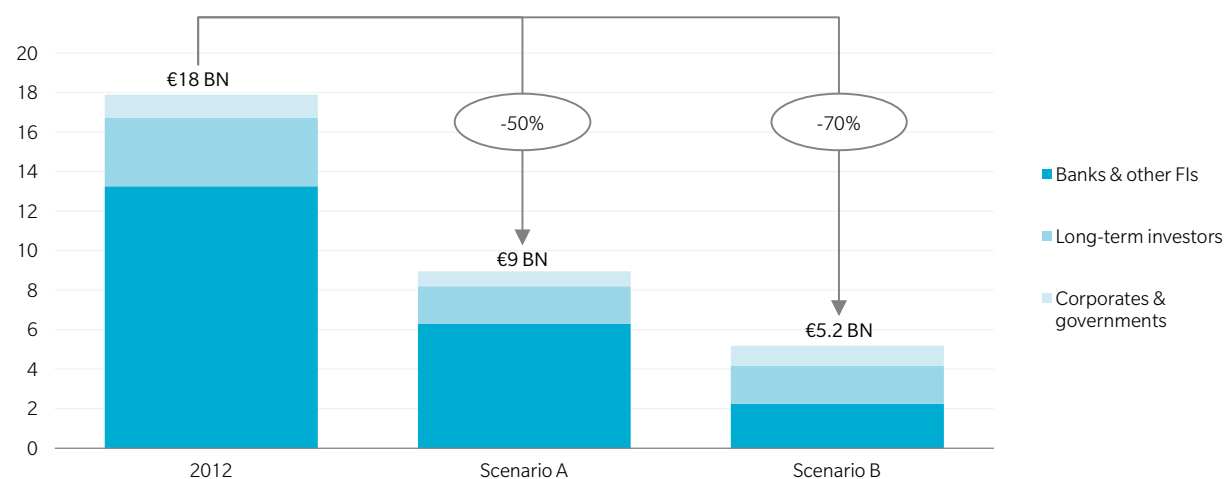
Source: Trading venues, Datastream, BIS, national debt management offices, Oliver Wyman analysis

## BEHAVIORAL RESPONSES ARE A KEY DRIVER OF UNCERTAINTY

Our analysis is based on assumptions about behavioural responses to the new taxes. These assumptions are grounded in standard economic theory, detailed data about current volumes and prices in the European securities markets and interviews with end-users and other market participants. Nevertheless, it is difficult to accurately predict market reactions. So it is important to understand the sensitivity of the results to alternative assumptions. We have modelled two alternative scenarios for each asset class: Scenario A uses conservative assumptions<sup>5</sup> about volume declines, while Scenario B uses a more radical shift in behaviour and market structure.

#### EXHIBIT 5: ANNUAL VOLUMES BY CLIENT TYPE (€BN)

##### GOVERNMENT BONDS EXAMPLE



Source: ECB, government debt management offices, Oliver Wyman analysis

In general, the more radical volume reductions under Scenario B imply lower “cascade effect” costs because the lower volumes mean that less taxes are paid and hence less is passed on to end-users. However, because volumes fall so much, the liquidity effect on transaction costs is greater. Because the “cascade effect” on costs is greater than the “liquidity effect”, Scenario A, where volumes decrease less, creates the greater additional cost for end users. It is important to note, however, that there is an additional implicit cost for end-users of not transacting that is not accounted for in these

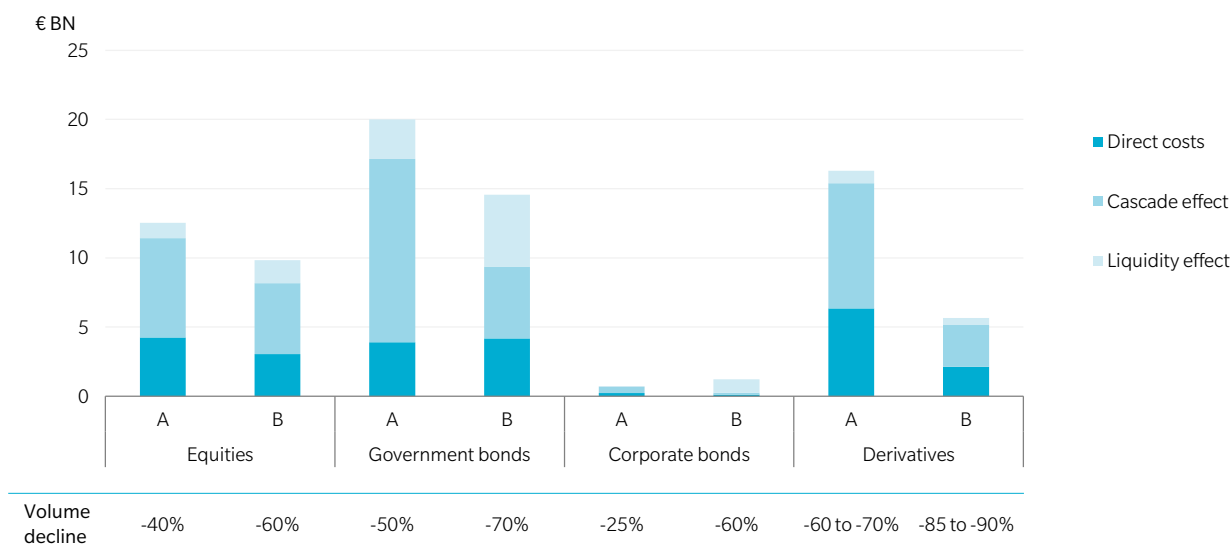
<sup>3</sup> Volumes of FX and interest rate derivatives traded by EU-11 end-users

<sup>4</sup> Weighted average bid-ask spreads observed across EU-11 instruments; 1 month tenor used for FX/Interest rate derivatives

<sup>5</sup> All volume declines based on granular assumptions on underlying counterparty behaviours, developed and refined in interviews with market participants

numbers; this will be represented via reduced portfolio returns or additional (un-hedged) risks on end-users' balance sheets.

**EXHIBIT 6: SUMMARY OF ANNUAL IMPACT BY ASSET CLASS (€BN)**



Source: Oliver Wyman analysis

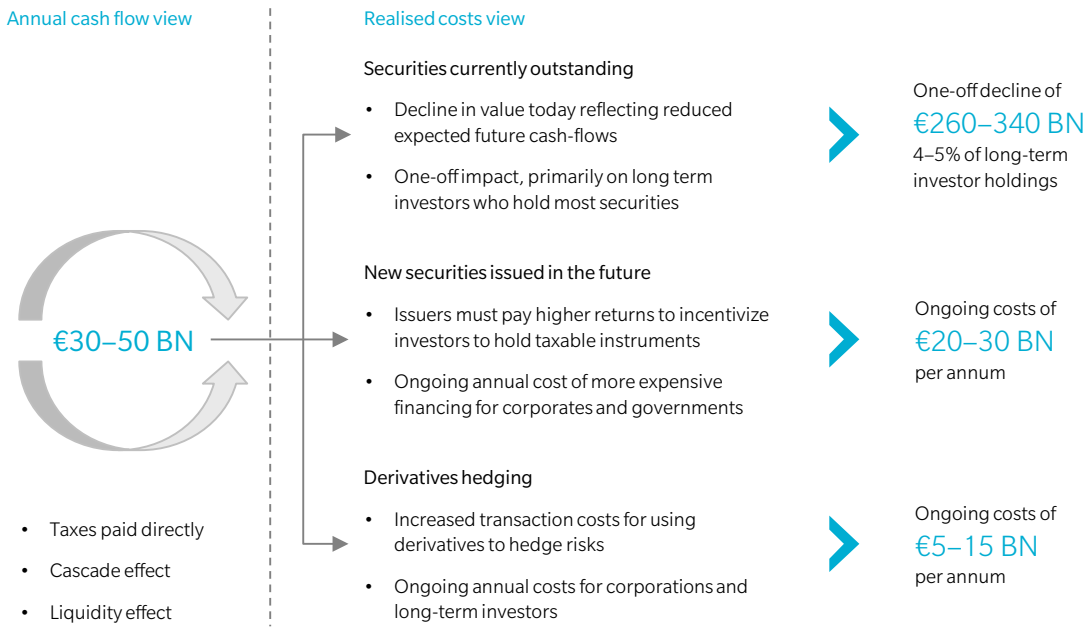
**COSTS ARE REALISED IN THREE CHANNELS**

The €30–50 BN annual cost figure represents a cash-flow view of the costs to end users resulting from the tax. In reality, however, the market would anticipate the higher future transaction costs and factor these into current prices. The costs of the tax would be felt by end users in three ways:

- Outstanding securities issued before the introduction of the tax by EU-11 entities would face a decline in value. The future cost of the tax would represent a reduction in expected future cash-flows from the securities. This would impose mark-to-market losses on holders of those securities as the market re-values these instruments to account for the FTT
- New securities issued by EU-11 entities after the introduction of the tax would achieve lower valuations, imposing higher funding costs on issuers of EU-11 securities. Many investors would have the choice between taxable instruments from EU-11 issuers and non-taxable instruments from other issuers, and will therefore demand a higher return from EU-11 issuers to compensate for the higher transactional costs associated with EU-11 securities
- Derivatives hedging would become more expensive on an on-going basis, imposing costs on both issuers and investors who are seeking to manage financial risks, such as interest rate and exchange rate risks



EXHIBIT 7: SCHEMATIC OF FTT COST IMPACTS: ANNUAL VS. REALISED COSTS



Source: Oliver Wyman analysis

COSTS TO CORPORATES

We estimate that annual costs for EU-11 corporates will increase by €8-10 BN as financing and risk management become more expensive. This represents 4-5% of post-tax corporate profits<sup>6</sup> in the affected economies, and will have a material impact on the ability of corporates to invest or pay dividends.

€7-8 BN of this is related to increased cost of financing through the debt and equity capital markets as investors require higher returns to compensate for the increased transactional costs. This reflects a 10-20bps increase in the yield on future corporate debt issuance (effectively the interest rate paid by the corporate), and a 6-8% reduction in market capitalisation on future equity issuance.

The remaining €1-3 BN of annual cost relates to exchange rate and interest rate risk management. Some companies will seek to circumnavigate the tax, for example, by shifting activity and financing into overseas entities. But this too will be costly, and will likely be an option only for the largest firms. There are also costs relating to increased financial risk-taking among end-users. Our analysis indicates a reduced use of derivatives for risk management purposes as these instruments become more expensive. This implies an increased financial risk-taking by corporates as they choose not to manage interest rate and currency risks.

*“10-20bps increase in cost of capital is significant – this may make the difference between a marginal infrastructure project going ahead or not”*

EU-11 energy company

We interviewed a range of corporates and found widespread concern about the expected costs of the tax and the implications for their business. They expect increased financing costs to drive reduced investment in infrastructure projects, as marginal investments turn negative. This is of particular concern for capital-intensive sectors such as utilities and manufacturing. These impacts are particularly regrettable given the wider goal in Europe of reducing dependence on bank lending, which will become more expensive under Basel 3 and the introduction of the leverage ratio. Corporates

<sup>6</sup> 2011 post-tax profits

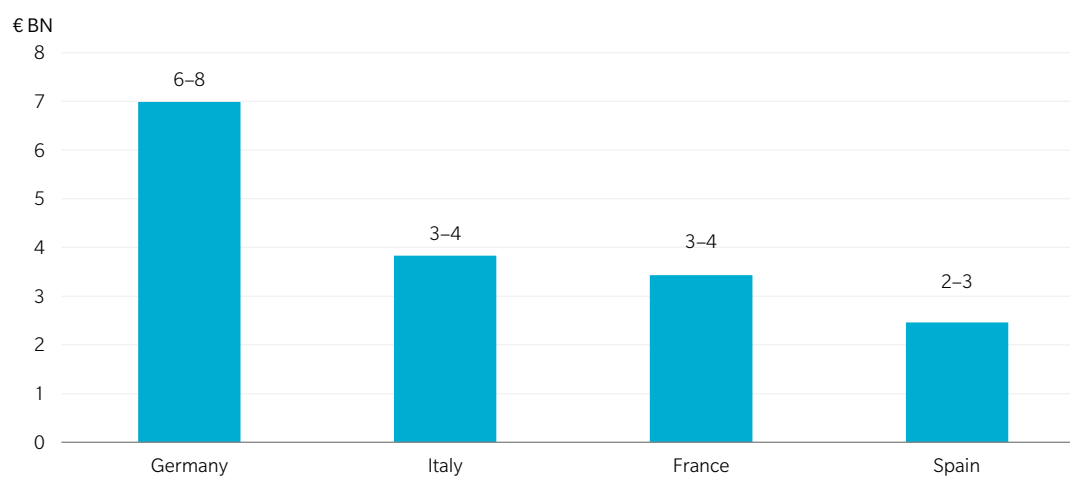
also expect depressed earnings and heightened earnings volatility as a result of increased hedging costs. This will further depress equity valuations as investors price in this volatility.

## COSTS TO GOVERNMENTS

We estimate that the annual financing costs of EU-11 governments will increase by €15–20 BN, equivalent to ~1% of total government debt issuance in 2012.

### EXHIBIT 8: INCREMENTAL EU-11 GOVERNMENT FINANCING COSTS

ANNUAL INCREASED FINANCING COSTS ATTRIBUTABLE TO FTT, SELECTED GOVERNMENTS, €BN



2011 LT debt issuance (€ BN)	440	480	600	220
Tax impact as % LT issuance	1.6%	0.8%	0.6%	1.1%

Source: OECD, Oliver Wyman analysis

The government bond market today is highly liquid, allowing investors to rebalance their holdings at low transactional cost, and allowing government bonds to play a number of other important roles in the financial system, notably as collateral and as bank reserves. This liquidity is supported by active market-making, in large part by appointed Primary Dealers, a system in which dealers trade among each other to facilitate client orders. The proposed FTT would undermine the profitability of the market-making role and force market-makers to either pass on the costs of these “cascading” trades to end clients or dramatically reduce liquidity provision to the market, with a commensurate increase in spreads. Investors would demand increased yields to compensate for these increased transactional costs, adding 20–30bps per annum to EU-11 sovereign debt yields for EU-11 governments.

## COSTS TO LONG-TERM INVESTORS

Asset managers and pension funds that invest in EU-11 securities will face a reduction in asset values of €260–340 BN, representing a 4–5% decline in the value of their current holdings. This would result from higher future transaction costs and lower future cash-flow expectations being reflected in current asset prices. This effect has been observed in other markets that have introduced stamp duties on share trading and is supported by a range of other studies<sup>7</sup>.

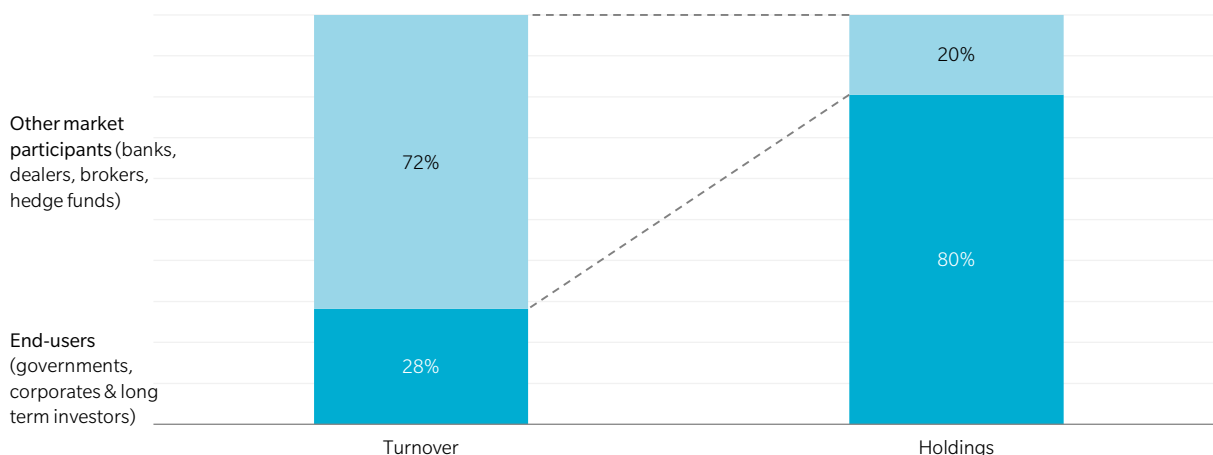
*“The FTT will directly hit asset values and reduce retail investors’ returns”*

German asset manager

<sup>7</sup> For example: Umlauf (1993) demonstrated that the Swedish stamp duty on equity trades (1%) resulted in ~5% decline in asset values of Swedish equities 30 days prior to the introduction of the tax. Bond, Hawkins & Klemm (2004) found that UK equity values were affected by levels of stamp duty, showing that announcements of changes in the tax rate in 1984, 1986 and 1990 “had a significant and positive effect on the price” of the security.

While end-users represent a minority of trading activity they represent the majority of securities holdings. End users would therefore bear the majority of the costs of this decline in value.

**EXHIBIT 9: END-USERS ARE THE MAIN HOLDERS OF SECURITIES, SO BEAR MOST OF THE COST OF LOWER ASSET PRICES**



Source: ECB, BATS Global Markets, national debt management offices, Oliver Wyman analysis

*“We have unavoidably high turnover of derivatives – we use futures to extend/shorten the duration of our cashflows to adjust for retail investors redemptions/inflows – we cannot move to a pure ‘buy-to-hold’ model”*

German asset manager

Investors would also face a €5–15 BN annual cost related to the increased cost of risk management as derivatives become more expensive. Our interviews with long-term investors revealed considerable concern around the impact on both securities and derivatives markets. There is only limited scope for long-term investors to reduce trading frequency because most are obliged to carefully match the profile of the assets they invest in against their liabilities to their end-customers – savers, the insured, and pensioners – by trading securities to rebalance portfolios and by using derivatives to manage risks.

The net effect will be reduced returns for savers and investors, as asset valuations are depressed and the on-going costs of risk management increase. One asset manager we interviewed estimated that a 40-year Riester savings plan (German state-backed savings) would face a 3–10% reduction in accumulated asset values as a result, effectively reducing the value of each individuals’ savings by €4–15 K.

**SECOND ORDER IMPACTS**

There are a number of other important second order considerations that impact end-users that we have not quantified in this work but that also merit attention.

The most important of these is the impact on the banking system. While we have not considered banks as end-users in this study, the tax also imposes costs on them, some of which may be passed on to end-users. Banks rely on the capital markets for both financing (issuing debt and equity) and risk management (with derivatives) and so face costs similar to other issuers. They also hold large quantities of government bonds, which are widely used as a form of collateral and which banks are incentivised to hold by the Basel 3 liquidity rules (LCR<sup>8</sup> and NSFR<sup>9</sup>). As holders of these and other

<sup>8</sup> Liquidity Coverage Ratio

<sup>9</sup> Net Stable Funding Ratio

securities, banks would face costs analogous to those described for long term investors under the FTT. By increasing the costs of banks doing business in EU-11 countries, the FTT would likely also increase the cost of bank lending to end-users in those countries.

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*“We would migrate our derivatives trading activity to London or Luxembourg and cease trading with EU-11 banks”*

Global consumer goods company

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There are also competitive considerations. The FTT places EU-11 banks at a severe competitive disadvantage in OTC derivatives markets, since they will be taxed on all global derivatives transactions (whereas foreign banks will only be taxed on trades with EU-11 counterparties). This will have further impacts on corporate lending markets. EU-11 banks will be forced to raise pricing to offset the lost income from the traditionally more profitable derivatives business.

A final important consideration is potential damage to the functioning of monetary policy through the disruption to government bond, repo and interest rate derivative markets. These markets play an important role in setting a yield curve and providing a stable reference price for a range of other instruments. Repo markets, which are also taxed under the FTT, are also key to the transmission of monetary policy as central banks use repos to inject cash into markets through purchases of fixed-income securities. The FTT would challenge the efficient operation of repo markets and thereby damage effective monetary policy transmission.

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*“Reduced liquidity in secondary fixed income markets... may hamper smooth monetary policy transmission and worsen market fragmentation at a time when many of these markets remain fragile”*

Yves Mersch, ECB

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## CONCLUSION

Financial markets are deeply connected. While the proposed FTT applies to securities transactions by financial market intermediaries and frequently trading participants, the cost of the tax would also be felt by end-users as intermediaries pass on the cost and withdraw liquidity. Corporates and governments would face higher costs of raising finance for investment; pension funds, insurers and asset managers would suffer losses as their investments lose value; and all end-users would face increased costs of risk management. The disruption to financial markets would also have second-order effects on end-users through increased costs and competitive dislocations in the banking system, and as financial risks are less well managed. These likely costs must be carefully weighed against the potential benefits of the tax.

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# 1. INTRODUCTION

## 1.1. OVERVIEW AND INTRODUCTION TO THIS PAPER

In September 2011, the European Commission first proposed a Financial Transaction Tax (FTT) that would be levied on all financial transactions within the EU. However, member states failed to reach a consensus, and concluded that EU-wide adoption of the FTT would not be viable. On 14<sup>th</sup> February 2013, the European Commission published a revised proposal for the FTT, covering 11 EU member states<sup>10</sup> (the EU-11) through a process of “enhanced cooperation”. While the revised proposal represents a narrower geographical scope than the original proposal, it also contained strengthened extra-territorial and anti-avoidance measures.

The proposed FTT will levy a 1–10bps tax on all financial instruments transacted with EU-11 counterparties, including securities, derivatives and cash management products. The FTT includes wide-ranging extraterritorial provisions which would tax all global transactions of EU-11 issued instruments, and all global transactions with EU-11 resident counterparties. The tax is planned for introduction during 2014.

The objective of this study is to conduct an independent assessment into the impact of the proposed EC FTT on EU-11 end-users. These end-users represent a wide range of “real-economy” participants, including corporations, governments and long-term investors (pension funds, asset managers and life insurers). The study aims to assess the impact of the FTT on the ability of end-users to raise capital, manage risks and invest.

The study aims to quantify the impacts on end-users by reference to transparent data sources and methodologies supported by existing empirical studies. Additionally, we have interviewed over 30 market participants in the preparation of this report, including long-term investors, corporate treasurers, and primary and secondary dealers. Note that all figures shown in this report are shown as rounded.

## 1.2. SCOPE OF ANALYSIS

This study considers the direct impact of the FTT on the following end-users:

- Corporates
- Governments
- Long-term investors (pension funds, asset managers, life insurers)
- Retail investors (via direct investment schemes, as well as participation in collective investment schemes, and as beneficiaries of institutional plans)

Other market participants – notably banks, hedge funds, inter-dealer brokers and exchanges – would be materially affected by the tax. We have considered their likely behavioural responses to the tax as a consideration in determining the ultimate cost borne by end-users. But we have not estimated the likely costs borne by these users, except where we believe these costs will be passed on to end-users.

We focus on capital raising within the EU-11 and the distribution of investments to long term investors, as well as the risk management activities corporates and long-term investors use to manage volatility incurred in their normal business activities. We therefore consider the following products within the analysis:

- EU-11 issued equities
- EU-11 issued corporate bonds
- EU-11 issued government bonds

<sup>10</sup> Austria, Belgium, Estonia, France, Germany, Greece, Italy, Portugal, Slovakia, Slovenia and Spain

- OTC derivatives traded by EU-11 non-bank end-users
- Listed derivatives on EU-11 exchanges
- Repos (indirectly)

There are a number of other instruments not listed above that are important for end-users but which are not directly addressed in this report, given our focus on the most material financial instruments for EU-11 end-users. These include:

- Commercial paper and capital raising via other money-market instruments
- Non EU-11 issued equities, corporate bonds or government bonds. (When traded by EU-11 long-term investors these would be taxable under the residence principle.)

Given this exclusion, our aggregate impact analysis remains conservative. We believe the total impacts would be greater if the above excluded products were considered. Additionally, we note that the residence principle may face further challenges in light of the European Council Legal Service's publication of an opinion (6<sup>th</sup> September 2013)<sup>11</sup>. Their opinion raised concerns that aspects of the proposed FTT (particularly the deemed establishment principle, part of the residence principle) may be discriminatory given the impact on states outside the EU-11. We note, however, that this opinion is non-binding.

Finally, we do not aim to quantify the broader macroeconomic costs or benefits of the FTT (e.g. GDP, employment) or to consider the use of tax receipts. The report purely aims to quantify the costs of the FTT on EU-11 end-users.

### 1.3. COMPARISON TO OTHER IMPACT STUDIES

A number of impact studies have been conducted to date which have varied considerably in scope, methodology and the size of the estimated impact. Our estimates differ from those of other studies in several respects. Here we highlight differences between our study and two important earlier studies: the European Commission's own 2013 impact assessment and the IMF's 2011 study into Financial Transaction Taxes.

The EC estimates the FTT will raise €34 BN in taxes across securities and derivatives. Our evaluation differs in a number of respects:

1. **Scope:** We consider only EU-11 issued securities and derivatives traded by EU-11 end users, whereas the Commission consider all taxable products (including non EU-11 product under the residence principle, excluded from our analysis)
2. **Dataset:** The Commission base their assessment on a limited dataset, and therefore underestimate the impact. For equities they exclude OTC and dark pool transactions, which represent ~50% volumes.<sup>12</sup> This explains why their €4.6 BN p.a. estimate for equities is considerably lower than our estimate of €8–10 BN. In fixed income markets, the EC base their estimate solely on exchange-traded bond markets, which they acknowledge represent only 5% market turnover, noting that if OTC transactions were included "the revenue from bond trading would be significantly higher."<sup>13</sup> Therefore the EC estimate of €8.4 BN tax receipts for bonds is understandably lower than our estimate of €15–20 BN
3. **Methodology:** The Commission quantifies only the tax revenue raised by the FTT, and not the broader impacts on market participants. They do not therefore quantify liquidity costs, nor do they consider the impact on asset values

<sup>11</sup> European Council Legal Service, Interinstitutional File: 2013/0045 (CNS), 6 September 2013

<sup>12</sup> Source: Thomson Reuters Market Monitor

<sup>13</sup> Commission Staff Working Paper Impact Assessment Accompanying the document Proposal for a Council Directive on a common system of financial transaction tax and amending Directive 2008/7/EC, volume 12, p.17

**EXHIBIT 10: SUMMARY COMPARISON OF EC VS. OW IMPACT ASSESSMENTS (€BN)**  
ANNUAL FTT COSTS BY ASSET CLASS

Asset class	EC <sup>14</sup>	OW <sup>15</sup>	Key differences
Equities	4.6	8–10	<ul style="list-style-type: none"> <li>OW includes EU-11 securities only</li> <li>OW include (taxable) volumes from OTC/dark pool transactions</li> <li>OW include additional liquidity costs</li> </ul>
Fixed income	8.4	15–20	<ul style="list-style-type: none"> <li>OW includes EU-11 securities only</li> <li>OW include (taxable) volumes from all OTC transactions; EC estimate based on exchange-traded bonds only</li> <li>OW include additional liquidity costs</li> <li>OW range shows potential volume decline scenarios (30–70% decline), versus EC flat</li> </ul>
Derivatives	21	5–15	<ul style="list-style-type: none"> <li>OW considers only end-user derivatives transactions (vs. EC market-wide assessment)</li> </ul>

The IMF 2011 report “Taxing Financial Transactions: Issues and Evidence”<sup>16</sup>, also provides a useful comparison. While the IMF study is not focused on the specifics of the proposed EU FTT, it does address the effects of FTTs more broadly and establishes a methodology for quantifying the market impact. Our report concurs with the IMF in several regards:

- Impact on asset values and increase in cost of capital** The IMF shares our view that rational investors will capitalise the future expected incidence of the FTT into asset prices, leading to a one-off decline in asset values (and an increase in cost of capital for issuers on new issuance). They find that a “10 basis point securities transaction tax (STT) would reduce their [the average stock’s] value by 7.6 percent and increase their cost of capital by about 25 basis points”. This analysis on stocks in the S&P 500 compares with our impact analysis on EU-11 stocks, which we estimate will face a 6–8% decline in asset value based on an average holding period of 0.5 years (vs. S&P 500 at 0.4 years), based on a 19.2bps tax. A linear interpolation of the IMF’s data table suggests our estimate is conservative
- Market-wide volume declines** The IMF finds that STTs “render some trades unprofitable [and therefore] reduce trading volume”
- Significant liquidity impacts** According to the IMF, “Investors clearly value liquidity, since they accept a lower return from more liquid securities”
- Impact would be borne by both holders of current securities, and issuers of new securities** The IMF report asserts that “a large part of the burden of an STT would fall on owners of traded securities, at the time the tax was introduced, as the value of stocks, bonds, and derivatives subject to the STT fell by the present value of the expected future STT liabilities on those securities”

In summary, impact assessments published to date vary considerably based on methodology, scope and underlying data. However, we find considerable support<sup>17</sup> for our central theses and quantitative impact assessment in the academic literature.

<sup>14</sup> Ibid., p.24

<sup>15</sup> Annual impact per asset class, shown for comparability. We do not compare our estimates of asset value reductions given the EC only quantify impact in terms of annual tax receipts.

<sup>16</sup> Matheson, Thornton, “Taxing Financial Transactions: Issues and Evidence”, IMF Working Paper (WP/11/54), March 2011

<sup>17</sup> See Appendix D for full bibliography



## 2. MARKET STRUCTURE OVERVIEW

Market structure varies across the affected securities and derivatives markets, reflecting the number of participants, natural liquidity and pricing structures. Market-makers and participants in the inter-dealer market are important liquidity providers, intermediating buyers and sellers of securities and bearing inventory risk to support efficient price formation and risk transfer. The FTT will impose material costs on these businesses and could shut down inter-dealer markets for some asset classes.

### MARKET STRUCTURE VARIATIONS

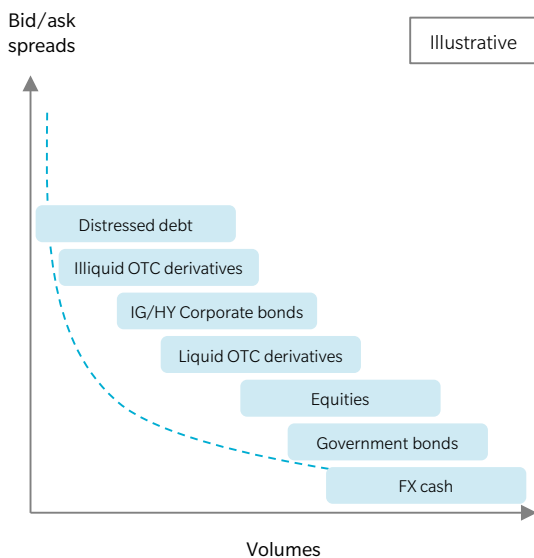
Because our analysis includes an assessment of the effect of the FTT on market liquidity, understanding the various market microstructures is fundamental to it. We characterise the “market structure” of a traded product by way of the following features:

- Trading venues – exchange-trading vs. multilateral trading facilities vs. bilateral over-the-counter trading
- Transparency of the order book – Central Limit Order Book (CLOB) vs. Request for Price (RFP) or Request for Quote (RFQ) markets
- Number of securities traded
- Average trade size
- Frequency of trades
- Number of market participants

These facts about a market influence the liquidity of the asset class concerned: that is, the ease with which the asset can be sold and turned into cash. As liquidity increases, bid-ask spreads fall – although the relationship is far from linear (see Exhibit 11).

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#### EXHIBIT 11: ILLUSTRATIVE LIQUIDITY SPECTRUM ACROSS MARKETS



## THE IMPORTANCE OF LIQUIDITY

Liquidity is defined as the ability to sell an asset on demand, and can be proxied by the relationship between volume and bid-ask spread; an instrument with high volumes and low-bid ask spread will typically be considered liquid. Investors require well-functioning markets to efficiently price and transact in an asset. For example, a life insurer who subscribes to a primary issuance of a corporate bond may have a future need to sell that asset: for example, if a credit rating downgrade required liquidation due to the rules of the insurers' investment mandate. Many long-term investors also have minimum liquidity thresholds so that their funds can meet near term liabilities even under adverse market conditions.

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*"We are a long-term investor, but the ability to sell an asset at any time is important to us; we are unable to invest in illiquid assets"*

French asset manager

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## THE ROLE OF MARKET-MAKERS

Market-makers act as intermediaries, buying and selling securities from end users and each other. This facilitates "price formation" and risk transfer for end investors. By acting in this capacity market-makers provide liquidity for the market, providing end-users with efficient entry or exit from a position where the opposite "real interest" order does not exist. Market-makers collect the "spread" or the difference between the buy price and the sell price as compensation for efficient price formation and bearing the principal risk on any open position. Market-makers frequently make losses on transactions – for example, when prices decline while the market-maker holds the asset. Market-makers' commitment to buy and sell the relevant asset is a critical component of the liquidity investors require to make their initial investment in the asset. In other words, efficient market-making underpins market confidence.

## INTERCONNECTED MARKETS

Securities, derivatives and financing markets are closely interconnected. The efficient functioning of one market is required for the efficient functioning of all. If the FTT affects one of these markets it will thereby affect the others too.

Securities markets trade the instruments that corporates and governments issue to raise capital. They do not function in isolation. Derivatives markets trade instruments that allow issuers and investors to mitigate and isolate risks arising from securities market transactions or from their business activities. For example, airlines use oil derivatives to hedge their exposure to increases in the price of fuel and ski-resorts use weather futures to hedge the risk of a snowless winter. Market-makers also use both derivative and securities markets to offset risks arising from their ongoing operations. These markets are highly connected. Efficient price formation and capital raising in securities requires well-functioning derivatives markets and *vice versa*.

Repo markets also support the efficient functioning of derivatives and securities markets. Repos involve the exchange of securities (usually short-term) with an agreement to repurchase them on a later date. This product provides an important financing and liquidity tool for investors, banks and corporates, enabling them to optimise their supply of cash and securities. For example, to facilitate a client sell order in a government bond, a market-maker will need to fund that position by exchanging the asset in the repo market until a natural buyer can be found. Without this funding source, the market-maker would be forced to fund the position at greater expense with cash or an unsecured loan.

The repo market also underpins the primary markets. Primary Dealers in government bonds and underwriters of corporate bonds need to fund their holdings of new issuance and hedge their underwriting risk by taking short positions – both accessed via repo markets. Without this, funding costs would increase and dealers' capacity to underwrite new securities issuance would be significantly reduced, with knock on effects for the costs and volume of primary issuance.

The impact of the FTT must, therefore, be considered in the context of an interconnected market system.

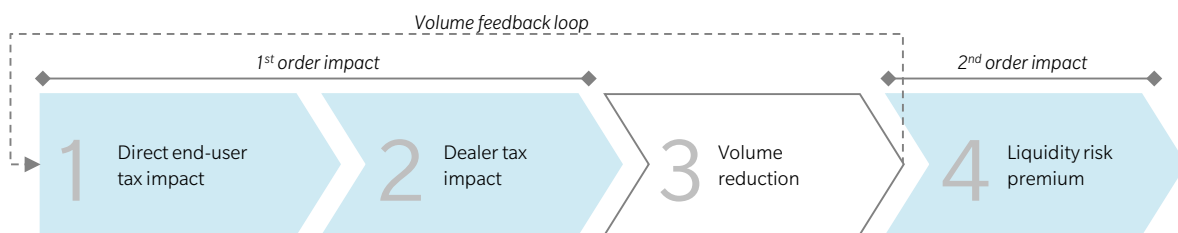
### 3. THE IMPACT OF THE FTT

The tax will impose costs on all participants in the EU-11 securities and derivatives markets. Corporates and retail customers are exempt from the direct tax<sup>18</sup>, while financial institutions are directly taxed at 10bps. However the total cost to end-users is likely to be higher than the direct tax as dealers pass on the cost of the many transactions they perform in fulfilling a single client order. The FTT will materially reduce liquidity in all secondary markets, with effects greatest in fixed income markets, where natural liquidity is lowest. This reduction of market liquidity pushes up bid-offer spreads and is felt by end-users in the form of higher transaction costs.

#### METHODOLOGY

The effects of the FTT on securities and derivatives markets can be seen as first order and second order:

##### EXHIBIT 12: FTT IMPACT METHODOLOGY SCHEMATIC



We first consider the direct cost of the tax on the end-users who pay it and the cost they bear from dealer costs that are passed on to them (1 and 2 from Exhibit 12). We then estimate counterparty volume reductions in response to increased transaction costs (3). Finally, we consider the liquidity impact of this volume reduction as bid-ask spreads widen further to reflect increased liquidity risk (4).

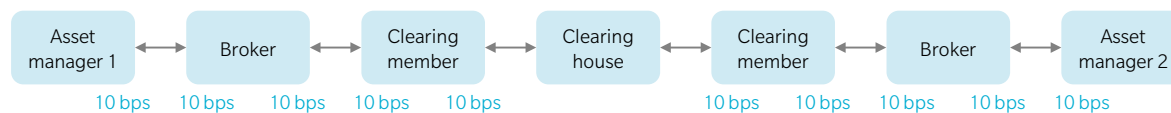
#### FIRST ORDER IMPACT

The FTT for securities is levied on the traded price. Therefore, the incidence of the FTT is directly driven by both the value of the security and its trading velocity. Trading velocity is a measure of how frequently an instrument is traded, and varies widely by market. EU-11 government bond markets, for instance, have a large stock of outstanding debt (€5.7 TN in 2012) and a high turnover rate of ~3x per annum, driving total value traded of €18 TN. This contrasts with EU-11 corporate bond markets, where lower outstandings (€765 BN) and trading velocity (0.6x per annum) lead to a lower value traded of €460 BN.

The FTT is levied on a gross basis creating a cascading tax. The result is that a single client transaction may result in many multiples of the original 10bps tax. The extent of the cascade will vary by transaction. In Exhibit 13, this centrally-cleared trade sees both sides of the transaction incur 50bps of tax for the single trade. For a complete asset transfer between investors, a total of 100bps of tax is incurred.

<sup>18</sup> Unless they conduct financial transactions representing >50% turnover in a single year, in which case they would be treated as financial institutions and therefore subject to the FTT. This may capture some corporate treasuries depending on the threshold and technical definition

### EXHIBIT 13: EXAMPLE TRADE CHAIN IN CASH EQUITIES MARKETS AND FTT IMPLICATIONS



At a market level, the number of transactions varies according to the liquidity of the market:

### EXHIBIT 14: DEALER-TO-CLIENT VS. DEALER-TO-DEALER TRANSACTIONS BY MARKET

	Cash equities	Government bonds	Corporate bonds
Dealer-to-client transactions	60%	50%	70%
Dealer-to-dealer transactions	40%	50%	30%
Client tax	10bps	10bps	10bps
Dealer tax	10bps	10bps	10bps
Interdealer tax <sup>19</sup>	15bps	20bps	10bps
Total tax levied on average chain	35bps	40bps	30bps

Source: Oliver Wyman proprietary data and analysis

The first order effect varies widely by asset class, driven primarily by the velocity with which the asset class is traded. Market-wide, we estimate an impact of €10–15 BN directly borne by end-users. We expect another €15–30 BN of first order tax costs generated by dealers facilitating end-user investment and hedging activities, with the majority likely to be passed on directly to end-users.

## PASS-THROUGH TO END-USERS

Although the client is only directly taxed up to 10bps<sup>20</sup>, we expect market-makers to pass on their increased costs by way of adding the tax to the bid-ask spread. The EC recognises this possibility in its impact assessment, when it states that “part of the tax burden is likely to fall on the clients of financial institutions”<sup>21</sup>. Academic research supports this, as Pomeranets (2012)<sup>22</sup> outlines, bid-ask spreads are composed of three key components:

- **Fixed costs** – e.g. order-processing, including brokerage, clearing and exchange fees, and infrastructure
- **Inventory costs** – e.g. the risk of holding inventory to facilitate client buy and sell orders over time including cost of capital, funding and inventory management
- **Information risk** – e.g. risk that the market-maker may have mispriced the transaction, or may be facing a counterparty with better information on the fundamental value of the asset

These costs will increase as a result of the FTT. The bid-ask spread will directly rise by at least 20bps (and up to 30–40bps in some markets, as shown in Exhibit 14).

The increase in transaction costs cannot be borne by market-makers. A basic analysis comparing 2012 EU-11 banks’ revenues in EU-11 issued securities demonstrates that the market-maker taxes would represent many multiples (3–7x) of the current revenue earned from intermediating those instruments.

*“We expect dealers to pass on their costs to the buy-side”*

German asset manager

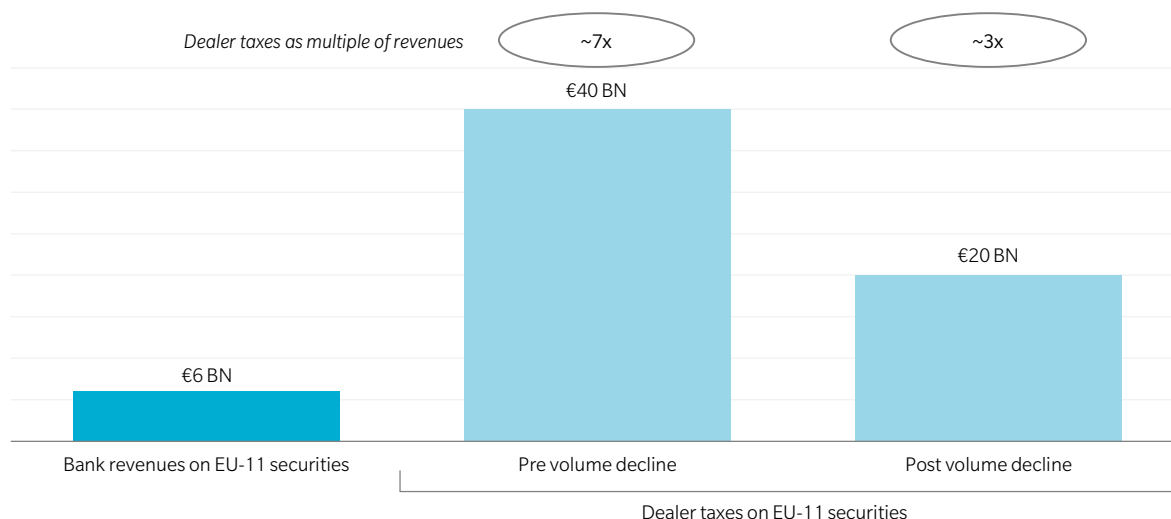
<sup>19</sup> Calculated as: (% D-D transactions / % D-C transactions) \* 10bps tax \* 2 sided trade. We assume that the majority of this cost is passed onto clients in the form of wider bid-ask spreads. We assume that dealers are only willing to participate in interdealer markets if they are fully compensated for the 2-sided FTT costs they will incur, therefore the tax levied on the chain is 2x the interdealer costs to reflect the tax on the bid and ask.

<sup>20</sup> If a financial institution, or corporate with significant financial markets activities

<sup>21</sup> SEC(2011) 1102 final, Vol. 1, European Commission Staff Working Paper, Impact Assessment (p54)

<sup>22</sup> Pomeranets, 2012, “Financial Transaction Taxes: International Experiences, Issues and Feasibility”, Bank of Canada review

## EXHIBIT 15: DEALER REVENUES VS. DEALER TAXES ON EU-11 ISSUED SECURITIES<sup>23</sup>



Source: Oliver Wyman proprietary data and analysis

## VOLUME DECLINE

The increased transaction costs associated with the FTT will drive down volumes as market participants avoid it, for example, by:

- Relocating to other jurisdictions with lower or no tax
- Substituting taxed products with untaxed or lower taxed products
- Terminating taxable activity (where relocation or product substitution is not possible and transactions become unprofitable)

Schwert and Seguin (1993) demonstrate that taxes on financial transactions drive lower market volumes as higher trading costs reduce trading activity, and some volumes migrate to untaxed jurisdictions or products. The EC estimates that securities volumes will decline by 15% and derivatives by 75%<sup>24 25</sup> as a result of these three reactions. However, the Commission argues that the design of the EU-11 FTT will limit the first two responses; volume declines will be limited by the “residence principle”, which requires the tax to be paid in any transaction involving an EU-11 resident, and the “issuance principle”, which applies the tax on any EU-11 issued instrument regardless of counterparty domicile. However, some relocation is expected for OTC derivatives because the issuance principle is unlikely to apply and the FTT’s impact could thus be mitigated by trading with non EU-11 resident counterparties.

<sup>23</sup> Bank revenues and taxes refer to EU-11 issued securities only (e.g. under the issuance principle). Excludes revenues and taxes on derivatives and non EU-11 issued securities (e.g. under the residence principle).

<sup>24</sup> European Commission SWD/2013.28 IMPACT ASSESSMENT accompanying the document Proposal for a COUNCIL DIRECTIVE implementing enhanced cooperation in the area of financial transaction tax

<sup>25</sup> The significantly higher volume decline in derivatives products is explained by low cost of hedging relative to notional (pre-FTT), and the fact that the tax applies to notional. Therefore the tax will represent significant multiples of the pre-FTT transaction costs (up to 1500x for short-dated swaps), and make these trades uneconomical. However, we believe the EC estimate of a 75% volume decline to be overstated, given non EU-11 counterparties will not be taxed (unless trading with EU-11 counterparties) and the fact that there is significant non EU-11 trading activity of these instruments. See section 6 for further details

We interviewed a Dutch pension fund which confirmed that they have developed comprehensive mitigation plans, including migration to UK and US government securities in order to minimise the tax impact. We expect similar plans for institutions which can mitigate the tax impact including:

- Placing term hedges, rather than dynamic risk management
- Shifting portfolio allocations in favour of untaxed assets (e.g. real estate, private equity)
- Relocating activities outside the EU-11 where possible

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*“We will shift our asset allocation away from the EU-11 to avoid FTT costs; we will invest more in UK and US equities and bonds ”*

Dutch pension fund

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However our interviews with EU-11 long-term investors confirmed that there are significant limiting factors that prevent many of them from mitigating their exposures entirely. These include:

- **Domestic asset biases:** Requirements by an investment mandate to hold local assets: for example, German pension funds being required to allocate a certain proportion of assets to German equities
- **Asset and liability management (ALM) requirements:** Matching investment activity to expected fund liabilities: for example, pension funds being required to liquidate positions to fund pensioner withdrawals
- **Portfolio rebalancing:** Regular rebalancing trades to remain within the fund mandate in terms of asset allocation (active funds) or index tracking (passive funds)
- **Duration management:** Adjustment of the duration of a portfolio (typically using interest rate futures) to ensure the optimal asset and liability mix and to meet the changing cash-flow requirements of the fund over time

Our volume reduction thesis is supported by experience of other FTT regimes, where transaction taxes have led to sharp volume reductions within a short period of time (Appendix C). We note, however, that all of these tax regimes (with the exception of Sweden) included exemptions for market-makers and other intermediaries.

The extent of the volume decline will vary by market and counterparty type, based on the possibility of relocation, availability of product substitutes and the economic value of the transaction. We expect volume declines of between 25% and 90%, varying by asset class (see sections 4, 5 & 6 for further details).

## IMPACT ON LIQUIDITY

We expect market-wide volume declines to drive meaningful reductions in asset liquidity. Pomeranets and Weaver (2011) confirm this thesis in their study of the impacts of securities transaction taxes and the relationship with bid-ask spreads; they find that “changes in FTTs are associated with a positive and statistically significant change in the bid ask-spread”.<sup>26</sup>

There is a strong inverse relationship between the value traded (total volume by value) of a security, and the bid-ask spread paid on price (equating to the total transaction cost). On average, the lower the value traded, the higher the bid-ask spread. This is a reflection of the increased liquidity premium that investors or market-makers require to buy a less liquid asset.

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*“The FTT will have pro-cyclical effects as it will add further costs in times of stressed liquidity when volumes are higher”*

German asset manager

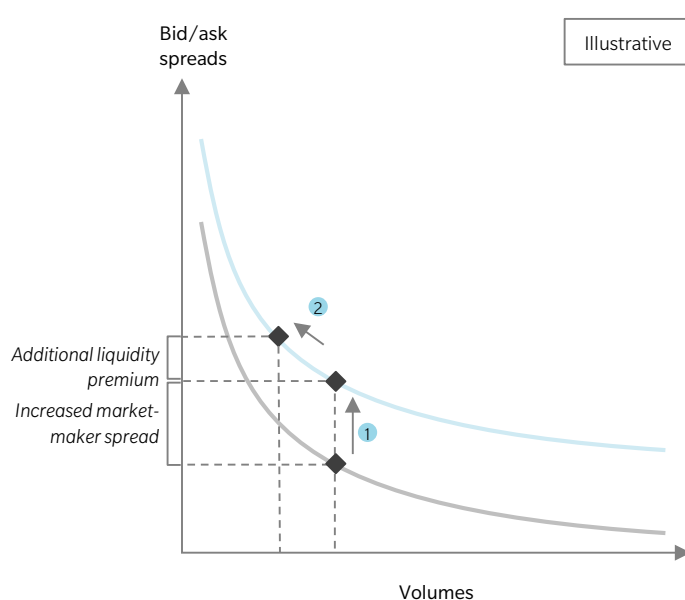
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<sup>26</sup> Pomeranets, A. and D. G. Weaver. 2011. “Security Transaction Taxes and Market Quality.” Bank of Canada Working Paper No. 2011-26., quoted in Ibid.

For each of the markets considered, we build a liquidity curve, plotting bid-ask spreads against value traded by instrument (or bundle of instruments). We use this to compute the relationship between spreads and volumes per market to estimate the liquidity premium resulting from market-wide volume declines. We then apply the market-wide volume decline which causes a shift along the curve and drives an additional liquidity premium in terms of increased bid-ask spreads. Exhibit 16 illustrates this concept in steps:

1. Shift of the liquidity curve upwards to reflect the increase in spreads as dealers pass on additional FTT costs incurred in market-making and interdealer markets. This shift varies according to the ratio of client to interdealer trades per market, ranging from 50bps for cash equities<sup>27</sup> to 60bps for government bonds
2. Shift the market along the curve based on the market-wide volume decline driving an additional liquidity premium in the form of increased bid-ask spreads. We also account for a “feedback loop” of volume reduction, which lowers the first order incidence of tax
3. We then use the market average liquidity premium as an additional cost on the market overall (i.e. liquidity premium x the value traded after the volume reduction) to estimate the market-wide cost of reduced liquidity

#### EXHIBIT 16: ILLUSTRATIVE LIQUIDITY CURVE



The impact on liquidity and the resulting costs borne by market participants varies by asset class. Across EU-11 securities and derivatives markets, we expect end-users to bear €5–10 BN in additional liquidity costs due to the widening of the bid-ask spread. It is important to note that this is not tax revenue but a cost caused by increased market friction and borne directly by end-users.

## CAPITALISATION OF COSTS

We expect the net impact of the FTT (direct taxes, volume decline and liquidity premium) to be capitalised into asset values, as investors price in the effects of the FTT. This thesis is supported by a number of academic studies that explore the relationship between tax rates and asset values. For example, Bond, Hawkins & Klemm (2004)<sup>28</sup> consider the change in tax rate for UK stamp duty and its effect on asset values. They conclude that stamp duty depresses share prices, as investors capitalise the cost into prices (and correspondingly, relaxation of stamp duty has a positive effect on asset values).

<sup>27</sup> For cash equities the 50bps increase in bid-ask spreads reflects the impact of 10bps dealer tax and 15bps interdealer tax (see Exhibit 14), doubled to reflect the impact on the bid and ask (two separate taxable transactions), i.e. (10bps + 15bps) \* 2 = 30bps

<sup>28</sup> Bond, Hawkins & Klemm, “Stamp Duty on Shares and its Effect on Share Prices”, Institute of Fiscal Studies, 2004

We modify the discounted cash-flow methodology used by Bond, Hawkins & Klemm to allow for discounting of pre and post-FTT cash-flows for equities and bonds. We project the future expected tax impact (including liquidity costs) to maturity for bonds, and to perpetuity for equities, and calculate the net present value of the asset after these deductions.

The discounted tax impact translates into a mark-to-market impact loss for current asset holders, as existing securities are re-valued to take into account future transaction costs.

#### EXHIBIT 17: IMPACT OF FTT ON ASSET VALUES (€BN)

	Cash equities	Government bonds	Corporate bonds	Total
Total annual costs	8–10	15–20	0.7–1.2	25–30
Total capitalised costs <sup>29</sup>	230–310	90–130	5–8	340–440
Long-term investor holdings	74%	90%	91%	80%
Long-term investor impact	170–230	80–110	~7	260–340
Annual issuance <sup>30</sup>	80	2,000	200	2,300
Issuer impact <sup>31</sup>	5–6	15–20	1–2	20–30

Source: Oliver Wyman analysis

For future issuance, the cost will be borne by issuers, as investors are able to price in the impact of the FTT at the time of issuance, and demand higher yields (for bonds) and lower equity valuations (for equity) to compensate. Thus we expect the FTT to increase the cost of capital. Studies by Amihud and Mendelson (1992) support this link between transaction taxes and cost of capital. They conclude that a 0.5% transaction tax would drive a 1.33% increase in cost of capital.

We estimate the total capitalised cost of the FTT on existing EU-11 assets at €340–440 BN. Because end-users are the primary holders of securities (holding 80% of EU-11 securities), they will bear the majority of this cost in asset value declines. End users will therefore face a €260–340 BN decline in asset values as investors re-value assets based on the increased future transaction costs. This represents a 4–5% devaluation of end-user held asset values.

*“We will revalue our securities portfolios to account for future FTT costs”*

Dutch pension fund

Asset managers we interviewed fully expected to revalue their portfolios to reflect the future FTT costs. This revaluation will directly hit retail investors’ returns from long-term investments such as pension funds, life insurance and mutual funds.

Additionally, we expect the reduced value of government bonds to be particularly challenging for EU-11 banks, who are significant holders of government bonds (for inventory, collateral and liquidity purposes). EU-11 banks will also be hit by a reduction in asset values. The 2–3% decline in government bond values could have a material impact on banks’ tier 1 capital ratios, limiting their ability to lend (or, potentially, requiring further recapitalization of the banking sector).

<sup>29</sup> Reduction in asset values of current outstanding EU-11 securities due to the capitalised future costs of the FTT

<sup>30</sup> Government and corporate bonds shown as 2012 total EU-11 issuance. Cash equities shown as annual average EU-11 issuance 2004-12 given cyclical nature of equity capital markets issuance

<sup>31</sup> Annual issuer impact calculated based on reduction in asset values applied to annual issuance volumes (post volume reduction) in each asset class



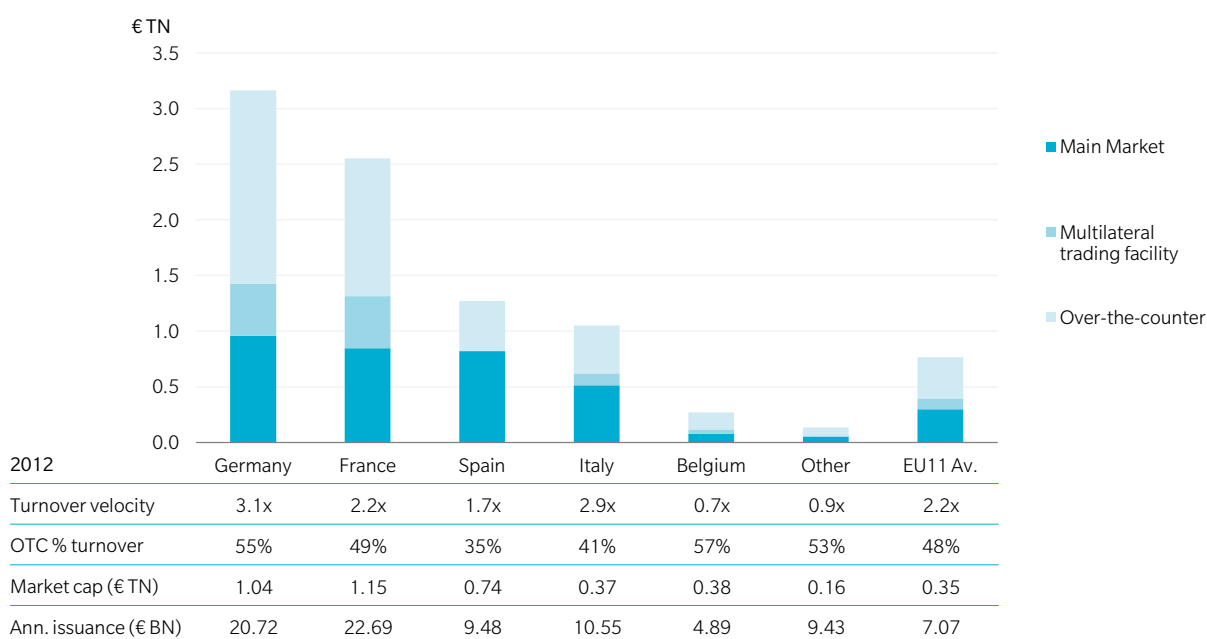
## 4. IMPACT ON EQUITIES MARKETS

EU-11 cash equities will be hit with by a one-off mark-to-market devaluation of €230–310 BN, equivalent to 6–8% of EU-11 market capitalisation. This will hit end-users with a direct reduction in asset values of €170–230 BN. Corporates will also suffer a €5–6 BN annual increase to their cost of capital from equity issuances. Market-wide, equity trading volumes will decline 40–60% as short term investors reduce their activities. This decline will lead to higher spreads that long term investors will need to pay when accessing the market. We anticipate the effect to lead to a “liquidity premium” cost of 8bps for the average security.

### CASH EQUITIES MARKET STRUCTURE

The cash equities market is generally considered to be among the most liquid markets, trading electronically in small lot sizes in transparently priced order books. While the market is ‘liquid’ there is not enough “natural interest” – that is real buyers and sellers of assets – to quickly satisfy all demand in the marketplace. As a result, market-makers are therefore still required to facilitate the efficient transfer of asset ownership in the majority of transactions.

EXHIBIT 18: VALUE OF SHARE TRADING<sup>32</sup> OF EU-11 EQUITIES (€ TN, 2012)<sup>33</sup>



Sources: BATS Global Markets, Thomson Reuters<sup>34</sup>, World Federation of Exchanges, Federation of European Securities Exchanges, exchange websites, Oliver Wyman analysis

The traded value of of EU-11 stocks was €8.4 TN in 2012, representing an average ~2.2x annual turnover velocity on market capitalisation of €3.8 TN (Exhibit 18).

Smaller markets (shown as ‘Other’) exhibit lower turnovers than larger markets, and are typically characterised by smaller cap stocks, less developed capital markets and overall lower demand for these securities.

<sup>32</sup> ‘Other’ countries include Austria, Estonia, Greece, Portugal, Slovakia & Slovenia; Annual issuance represents average annual issuance 2004-12

<sup>33</sup> Local FTT regimes covering the majority of equity trading was introduced for France in August 2012, and for Italy in March 2012. Volume declines associated with the FTT are included in turnover figures as reported.

<sup>34</sup> Thomson Reuters Equity Monthly Market: <http://thomsonreuters.com/monthly-market-share-reports/>

We also include the value of over-the-counter (OTC) transactions in our turnover data. On average, OTC transactions under current MiFID reporting rules represent ~45–50% total turnover across the EU-11. It is important to note that only around one-third of the reported OTC turnover represents genuine additional liquidity because about two-thirds are also reported as on-exchange trades. Genuine OTC trades include transactions between counterparties that are conducted ‘off-platform’ such via as broker crossing networks. ‘OTC reporting events’ include prime brokerage ‘give-ups’ and ‘give-ins’ and other principal transactions on behalf of clients that represent a transfer in ownership of the equity. OTC Reporting Events are essentially duplicative trades already reported elsewhere and are not true indicators of market liquidity. While OTC reporting events do not represent addressable liquidity, we believe they would be considered separate taxable events for the purposes of the FTT and are therefore included within the scope of our analysis.<sup>35</sup>

## DIRECT IMPACTS

Across EU-11 equities markets, client-to-dealer transactions represented €4.8 TN in value traded in 2012. The majority of this (96%) was transacted by financial institution clients – and would therefore be subject to the 10bps tax. As outlined in section 2, we expect market-makers to pass on taxes incurred on the “sell-side” of the transaction, as well as costs incurred in interdealer markets required to manage the dealer inventories. For cash equities markets this represents an additional 25bps in indirect costs on end-users<sup>36</sup>.

We anticipate that the increase in transaction costs will drive fundamental changes in client (and dealer) trading behaviours, as market participants consider the economic viability of certain trades and mitigation options. Behavioural responses are expected to vary widely by counterparty type, based on existing trading velocity, domestic biases and the overall extent to which the counterparty is able to reduce trading volumes. We base our overall assessment on the likely volume reduction by decomposing the market into different counterparty types and estimating the likely response by user. The estimated volume declines are assumptions based on expert interviews with dealers and investors across the EU-11, and are shown as a range given the uncertainty. Overall we estimate a volume decline of 40–60% for EU-11 equities markets:

### EXHIBIT 19: ESTIMATED CLIENT VOLUME REDUCTION IN RESPONSE TO INCREASED TRANSACTION COSTS

Client type	Reduction in volume traded	Rationale
Banks	25–30%	<ul style="list-style-type: none"> <li>Interdealer volumes decrease as a function of overall client flows</li> <li>However interdealer share of total volume increases as reduced market liquidity drives increased demand for intermediation as order-crossing opportunities are limited</li> </ul>
Non-bank market makers	50–90%	<ul style="list-style-type: none"> <li>Sharp decline in non-bank market making due as tax represents many multiples of current (thin) margins</li> <li>Existing economic model no longer economically viable, driving significant volume reductions</li> </ul>
Hedge funds	70–90%	<ul style="list-style-type: none"> <li>Quant hedge funds (~10% market) cease high frequency trading in EU-11, due to non-viability of transaction-level economics; 100% volume decline</li> <li>Long-short funds (~6% market) down 50% due geographic migration and curtailment of EU-11 activity</li> </ul>
Asset managers	20–30%	<ul style="list-style-type: none"> <li>Shift away from active strategies and lengthening of holding periods</li> <li>Product substitution &amp; geographic migration considered where possible (e.g. Dutch funds trade UK equities over German), but structural limitations to mitigants</li> </ul>
Pension funds	10–20%	<ul style="list-style-type: none"> <li>Long term investors with low turnover; trading strategy unlikely to be significantly impacted, though marginal reduction in turnover expected</li> </ul>
Insurance	10–20%	<ul style="list-style-type: none"> <li>Changes in portfolio allocations towards untaxed assets (e.g. real estate)</li> <li>Mitigation options limited by: <ul style="list-style-type: none"> <li>Domestic asset bias (e.g. German PFs restricted to German equities)</li> <li>Portfolio rebalancing requirements remain</li> </ul> </li> </ul>
Corp., Retail & Publics	0–10%	<ul style="list-style-type: none"> <li>Limited volume reduction due to existing low volumes (&lt;5% market today) and limited viable alternatives</li> </ul>
<b>Total</b>	<b>40–60%</b>	

<sup>35</sup> OTC Real Liquidity 16%, AFME, The Nature and Scale of OTC Equity Trading in Europe, April 2011

<sup>36</sup> Comprised of an additional 10bps dealer tax and 15bps interdealer taxes (see Exhibit 14 for breakdown). The 25bps is in addition to the 10bps client tax levied (if a Financial Institution).

Post-volume decline, the direct impact cost of the FTT in EU-11 equities markets is €6–10 BN, of which ~70% is dealer costs passed on to clients. The greater the volume decline, the lower the direct FTT impact. The direct impact represents an average of 35bps tax on client trades across the EU-11 (comprised of 10bps client taxes<sup>37</sup>, 10bps dealer taxes, and ~15bps interdealer taxes<sup>38</sup>).

This analysis shows the expected impact on average across the EU-11, where the average stock trades at ~20bps average bid-ask spread. However, at the level of an individual stock there would be significant skews. More liquid stocks today (i.e. those with lower average bid-ask spreads) would face a greater impact than the market. For these instruments, the FTT represents an even greater proportion of the pre-FTT transaction costs. For example, (e.g. for a stock with 5bp average spread, a 30bps tax represents 6x increase in transaction costs). For these instruments we would expect an even greater volume decline.

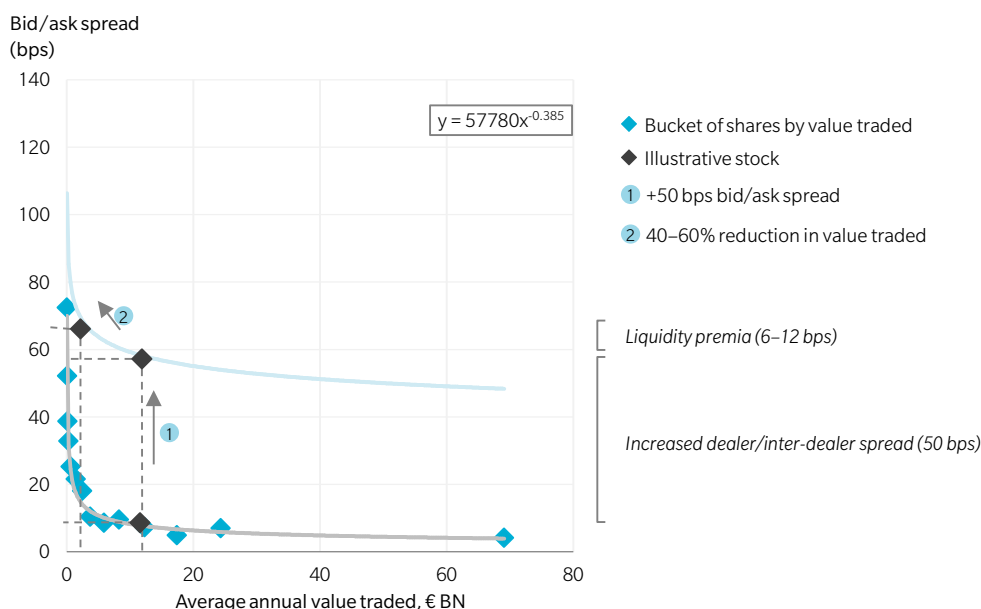
This calculation of the first order tax impact considers only the application of the FTT to EU-11 stocks, and therefore is a conservative estimate. The “residence principle” of the current EC proposal would see all EU-11 resident financial institutions taxed on any cash equity transaction globally, regardless of the underlying equity. And any global financial institution trading cash equities with an EU-11 non-financial counterparty would also be hit by a 10bps direct tax.

## LIQUIDITY IMPACT

As a result of the market-wide volume decline, we expect a further increase in bid-ask spreads to reflect reduced liquidity. Based on the relationship between volumes and bid-ask spreads today, we estimate the 40–60% reduction in market volumes would add 6–12bps in additional liquidity premium on bid-ask spreads for the average EU-11 stock. The greater the volume decline, the greater the liquidity premium. This would equate to €1–2 BN in increased transaction costs for market participants.

Exhibit 20 illustrates the volume shift and impact on bid-ask spreads for EU-11 stocks.

EXHIBIT 20: EU-11 EQUITIES LIQUIDITY CURVE<sup>39</sup>



Source: Trading Venues, Thomson Reuters, BofAML analysis, Oliver Wyman analysis

<sup>37</sup> Blended rate of 10bps for financial institutions (92% volumes) and 0bps for non-financial institutions (8%)

<sup>38</sup> Based on proportion of interdealer trades per dealer-client transaction. ~40% EU-11 equities volumes represented by interdealer activity, therefore 0.75 interdealer transactions per dealer-client transaction (43%/57%). 15bps calculated as 2 sided tax incurred in interdealer market ( $2 * 10bps * 0.75 = 5bps$ ), based on the assumption that interdealer market participants will demand compensation for the FTT on both the bid and ask, and this cost will be passed through to the end-client. Therefore total direct costs calculated as €4.8TN client volumes \* 35bps = €17 BN direct costs pre volume reduction. €17 BN \* 40-60% volume reduction = ~€8-10 BN. (Note: figures are rounded)

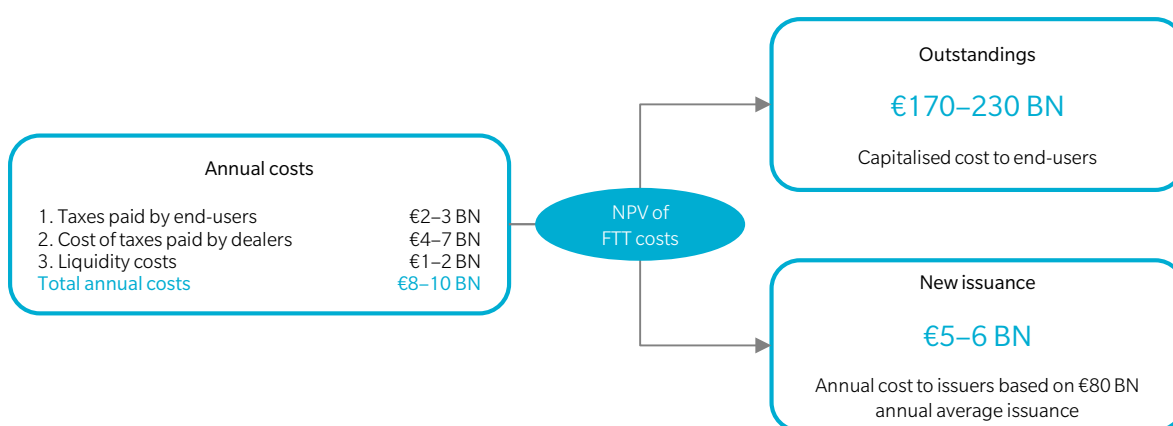
<sup>39</sup> Annual average value traded (2012)

However, there would be significant variation in liquidity impact along the curve, with lower liquidity stocks (i.e. those with higher bid-ask spreads and lower volumes) facing higher liquidity premia. For instance, Frendy Energy SA – an Italian hydroelectric energy firm, with an annual value traded of ~€11 MM and average bid-ask spread of 3.2%<sup>40</sup> – would attract an additional liquidity premium as high as 35–70bps versus the market average of 6–12bps. The liquidity effect would therefore disproportionately impact affect mid and small-cap corporates.

## IMPACT SUMMARY

Overall, the impact of the FTT will reduce the value of EU-11 cash equities by €230–310 BN, representing a 6–8% reduction in market capitalisation of EU-11 stocks. This loss will be borne by the current holders of these assets – including substantial holdings by long-term investors such as pension funds and mutual funds – as rational investors “price in” the future cost of the FTT into perpetuity when considering the present value of EU-11 stocks. Because long-term investors hold ~75% EU-11 equities, this equates to a €170–230 BN one-off reduction in asset values for long-term investors.

### EXHIBIT 21: SUMMARY OF FTT IMPACTS FOR EU-11 CASH EQUITIES



For issuers, the impact will be felt on new equity issuance – in terms of IPOs or follow-on issuance – following the announcement of the FTT, when investors are able to ‘price in’ the future costs of the FTT. Underwriting syndicates we spoke to as part of this study supported this thesis, suggesting that institutional investors would feed the FTT impact into their valuation models as they consider the net impact of the FTT cost given expected trading velocity. The FTT would therefore reduce the value of equity-capital raised for EU-11 issuers by 6–8% (or €5–6 BN annually<sup>41</sup>). This would drive material increases in cost of capital for EU-11 corporates (see Kabel Deutschland case study).

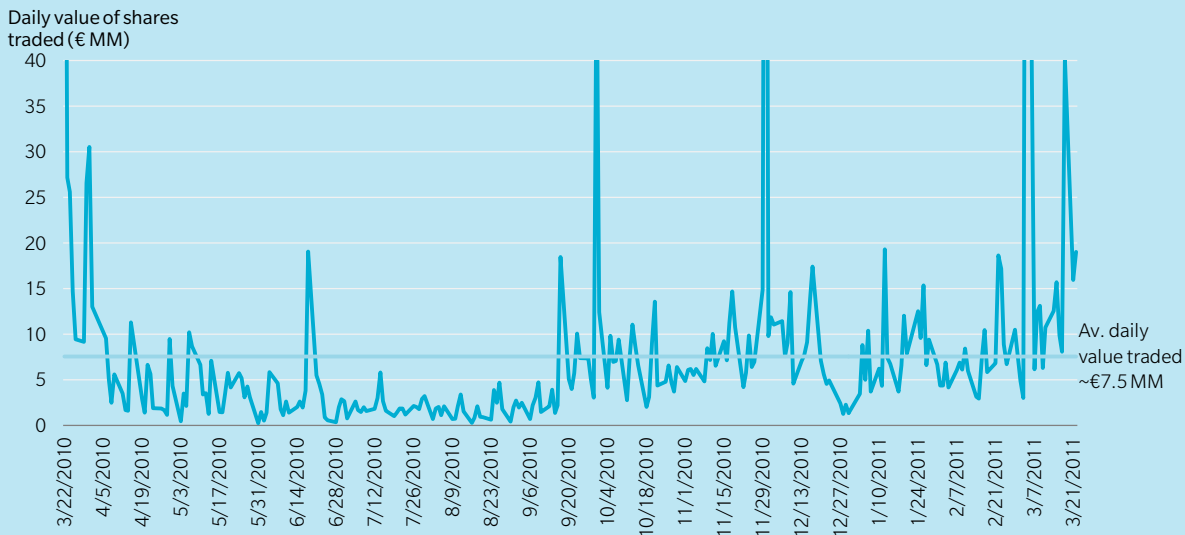
<sup>40</sup> Source: Datastream

<sup>41</sup> Based on average annual issuance 2004-2012 on EU-11 exchanges

## CASE STUDY: KABEL DEUTSCHLAND 2010 IPO

Kabel Deutschland<sup>42</sup> is Germany's largest cable television operator, serving 8.5 MM households across the country. Originally founded as a unit of Deutsche Telekom, Kabel Deutschland debuted on the Frankfurt Stock Exchange on 22<sup>nd</sup> March 2010. 35 MM shares were sold at the low end of the price range, at an issue price of €22, raising €760 MM in equity capital. In the 12 month period following the IPO, the stock traded ~€2 BN in volume, representing ~1x market capitalisation:

### DAILY VALUE OF SHARES TRADED (€MM)



Source: Datastream, Dealogic, Oliver Wyman Analysis

We estimate issuance proceeds of Kabel Deutschland could have been reduced by 3–4% (or €20–30 MM)<sup>43</sup>. The calculation follows the methodology used by Bond, Hawkins & Klemm, outlined in section III. Simplified, this methodology calculates the present value of future costs to investors and reduces current asset values by the present value of these costs. Future costs to investors come in the form of higher transaction costs, caused by taxes and higher liquidity premia. These costs reduce future cash flows to investors, so therefore rational investors price them in.

<sup>42</sup> Note: this case study is based solely on public data and Oliver Wyman analysis. It does not represent the opinions of the named company, who has not been contacted in the preparation of this report.

<sup>43</sup> Calculation assumes investors are able to price in the full cost of the FTT pre-IPO, including direct tax, increased transaction costs resulting from market-maker spreads and interdealer costs, and liquidity premium. Assumes 40-60% volume decline post-FTT in line with market-wide volume decline assumption. Additionally, the calculation assumes that investors are able to accurately forecast the 12 month turnover velocity (in practice, we expect proxies or market-wide assumptions would be used).

## 5. IMPACT ON FIXED INCOME MARKETS

*The FTT will reduce the value of fixed income securities by €100–140 BN, with €90–115 BN of this cost borne by end-users. Corporates and governments will face ~€15–20 BN annual increase in financing costs as investors demand increased yields to compensate for the FTT. Volume declines will be sharpest in fixed income – where market making is most critical – and could trigger a fundamental breakdown in market structure and a transition to an illiquid market. This could push transaction costs up to ~6x today's level, as bid-ask spreads widen by more than 100bps, imposing additional costs on market participants.*

### MARKET STRUCTURE – CORPORATE BOND MARKETS

Bond markets have very different liquidity characteristics than equities. Corporate bonds, in particular, are less liquid securities than equities because they are more heterogeneous. They often have significantly different terms: varying with respect to (e.g. duration, debt seniority and resulting credit quality impacts, break and conversion clauses and, interest rate terms, etc.). This heterogeneity of the corporate debt market results in a highly fragmented secondary market, with a large number of different securities relative to total outstanding debt.

The EU-11 corporate bond market has €765 BN debt outstanding<sup>44</sup>, and represents a significant and increasingly important source of corporate capital as Basel 3 regulations broadly favour capital markets debt raising over bank lending. Corporate debt markets within the EU-11 have grown significantly since the financial crisis, as financial sector deleveraging (and the increasing cost of bank financing) has driven corporates to bond financing; corporate bonds now represent ~40% European corporate debt financing, up from ~25% in 2007.<sup>45</sup>

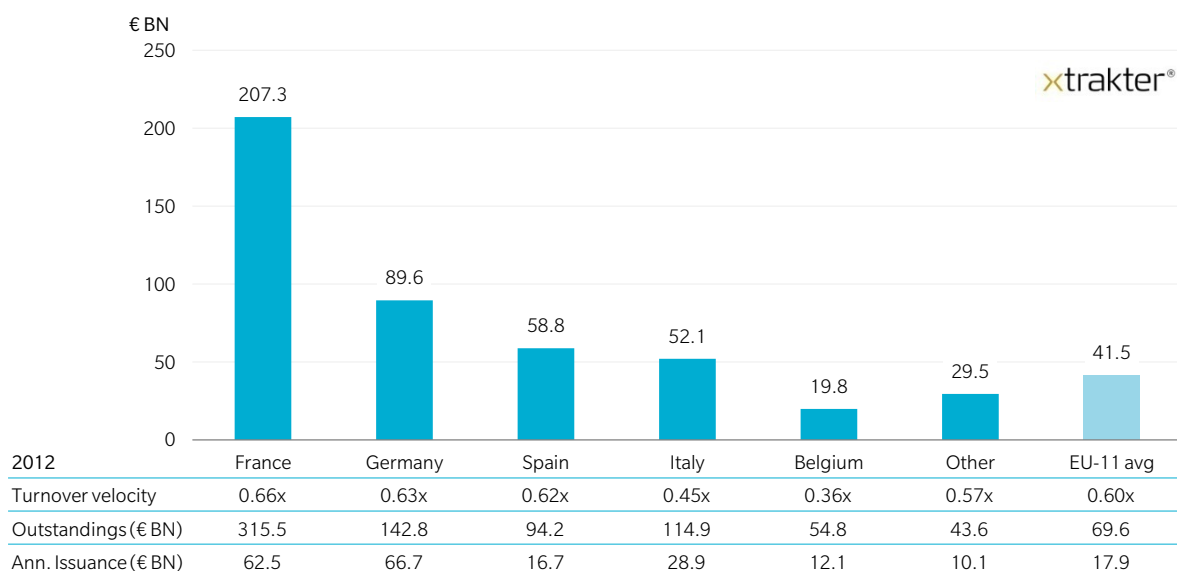
Corporate debt exhibits relatively low turnover velocity: versus other asset classes – 0.6x annual turnover, versus compared to 1.1x for equities and 3.1x for government bonds. This lower turnover is explained by the fragmentation of the market and as well as the fact that these instruments are often held by long-term investors on a buy-to-hold basis to meet investors' long-term liabilities. For example, a French asset manager we interviewed typically held corporate bonds for a holding period of around about 5 years (compared with 2 years for government bonds).

<sup>44</sup> 2012, excluding short-term debt <1 year maturity

<sup>45</sup> Unlocking funding for European investment and growth, AFME & Oliver Wyman, 2013

EXHIBIT 22: VALUE OF CORPORATE BOND TRADING<sup>46,47</sup>

EU-11 ISSUED BONDS (€BN, 2012)



Sources: Xtrakter, Dealogic, Oliver Wyman analysis

## MARKET STRUCTURE – GOVERNMENT BOND MARKETS

The government bond market is more homogenous and is typically considered a liquid market, especially for G20 issuers in times of normal functioning markets. These markets exhibit high traded volumes and tight spreads – although there is significant variation across issuers based on their country-level macroeconomic fundamentals). These characteristics make most government debt instruments ideal for collateralised short-term liquidity and cash management by banks and cash rich corporates.

Turnover velocity of government bonds is 3.1x per annum across the EU-11. The key driver of this trading velocity is the use of government bonds as high quality collateral for liquidity and cash management. Government bonds are also important as hedging instruments underpinning the derivatives market. This drives the high trading velocity of government bonds, and therefore a high incidence of the FTT (versus corporate bonds).

<sup>46</sup> Turnover is calculated based on EU-11 outstanding bonds, excluding short-term debt <1 year, multiplied by average turnover velocity per country. Turnover velocity multiples are derived from Xtrakter data for a sample of 450 bonds, representing ~30% outstanding EU-11 corporate debt.

<sup>47</sup> Note: corporate bond analysis excludes financial institution bonds given the stated end-user perimeter of this report. We do note, however, that financial institution bonds are a significant financing instrument for banks and the additional costs incurred may feed through to lending margins, indirectly impacting end-users.

**EXHIBIT 23: VALUE OF GOVERNMENT BOND TRADING<sup>48</sup>**  
 EU-11 ISSUES (€ TN, 2012)



Sources: ECB, EU-11 government debt management offices, Oliver Wyman analysis

## DIRECT IMPACTS

Across EU-11 fixed income markets, client-to-dealer transactions represented €330 BN in value traded for corporate bond markets, and ~€9 TN for government bond markets. The majority of this volume is subject to the 10bps FTT as financial institutions represent ~93% volumes<sup>49</sup>. However, we expect the direct cost to clients to be significantly higher than this given the importance of interdealer markets. We expect market-maker costs and costs incurred in interdealer markets to impose an additional 20bps on corporate bonds, and 30bps on government bonds (on top of the 10bps client tax)<sup>50</sup>. We assume 100% of these dealer and interdealer costs will be passed onto the end client.

The increase in transaction costs is expected to drive material changes in counterparty behaviour to mitigate the impact of the FTT. Market-wide we expect volume reductions across both corporate and government bonds, though the reductions will vary by counterparty type based on trading behaviours, availability of alternatives and other structural factors (such as investment mandates).

Government bonds are a critical source of liquid high quality collateral and underpin all fixed income related markets – rates, FX, corporate debt, etc. – both as a reference and as a financing tool. Given the interconnectedness of markets – and the systemic role of government bond markets – it is difficult to accurately predict the volume decline expected. So we consider two scenarios.

<sup>48</sup> Central government debt only (excludes local government, agencies, municipalities)

<sup>49</sup> Depending on the inclusion of corporate treasuries within the definition of ‘financial institution’ (where financial transactions represent >50% turnover), the proportion of financial institution volumes could be higher than 93%.

<sup>50</sup> For corporate bonds this is comprised of an additional 10bps dealer tax and 10bps interdealer taxes. For government bonds this is an additional 10bps dealer tax and 20bps interdealer taxes. See Exhibit 14 for breakdown.



## SCENARIO A

The first scenario (A) sees an overall volume decline of 25–50% across fixed income markets (with sharper declines in government bond markets). These declines assume marginal changes in client trading behaviour (similar to the effect in equity markets). We assume that market structure remains broadly unchanged, and market-makers continue to play an important role in providing liquidity and facilitating access to assets, (albeit at a higher cost to clients). This scenario is characterized by:

- Hedge fund volumes decline by 20–40% as many consider relocation outside of the EU-11 and consider product substitution (e.g. non EU-11 fixed income)
- Investor appetite for Euro bond funds declines in response to reduced returns, driving net outflows of assets under management (AUM)
- Longer-term investors (e.g. pension funds) change behaviours including lengthening of holding periods, shifts away from active strategies and consideration of product substitutes
- Pension funds and insurers reduce volumes by 5–10%. These volume reductions are limited by the asset and liability (ALM) requirements and investment mandates. Many of these investors are already “buy-to-hold” investors and therefore have little scope to reduce transactions further
- Asset managers reduce volumes by 15–30% as they reduce velocity and migrate into tax exempt assets

Overall, this causes the number of corporate bond transactions to fall by 25% and government bonds by 50%.

## SCENARIO B

In scenario B, we consider the impact of a fundamental shift in market structure triggered by the FTT and the breakdown of the interdealer market in response to prohibitive costs. This scenario sees significantly sharper volume declines: 60% for corporate bonds and 70% for government bonds.

This scenario considers the relationship of fixed income markets to other adjacent markets, such as the repo and derivatives markets and considers the secondary impact of the taxes on these adjacent fixed-income markets on facilitating trading in bond markets. For example, in this scenario, the short-dated repo market would become untenable and closes<sup>51</sup>. Given the importance of repo markets in funding bank market-making positions and providing hedges to facilitate two-way liquidity, without access to this market, banks are severely limited in their ability to fund market-making positions and to facilitate client transactions. In this scenario:

- Banks limit their role in intermediating clients in government bonds
- The interdealer market is effectively closed
- Dealers take on larger inventories to support limited business
- Dealer capital costs would impose a ceiling on dealer inventory holdings and client facilitation

While we see this as an extreme scenario, the untested structure of the tax requires consideration of extreme market dislocation.

Overall, the post volume decline direct costs (after the volume reduction) in Scenario B are €260–680 MM for corporate bonds, and €10–20 BN for government bonds. The difference between the direct costs in Scenario A and Scenario B are caused by the very different volume effects in the two scenarios.<sup>52</sup>

<sup>51</sup> See section 0 for further detail

<sup>52</sup> Direct cost analysis considers only the tax in EU-11 issued debt securities; the total tax impact will be higher than this as EU-11 institutions trading non EU-11 securities would also be taxed under the ‘residence principle’.

EXHIBIT 24: DIRECT COST IMPACTS OF THE FTT ON FIXED INCOME MARKETS (2012)

Scenario	Corporate bonds		Government bonds	
	A	B	A	B
Client-to-dealer value traded	€330 BN	€330 BN	€9.2 TN	€9.2 TN
Volume decline	-20%	-60%	-50%	-70%
Value traded post-volume decline	€250 BN	€140 BN	€4.6 TN	€5.2 TN
1. Taxes paid by end-users	€230 MM	€120 MM	€5 BN	€5 BN
2. Cost of taxes paid by dealers	€450 MM	€140 MM	€15 BN	€5 BN
Total direct costs	€680 MM	€260 MM	€20 BN	€10 BN

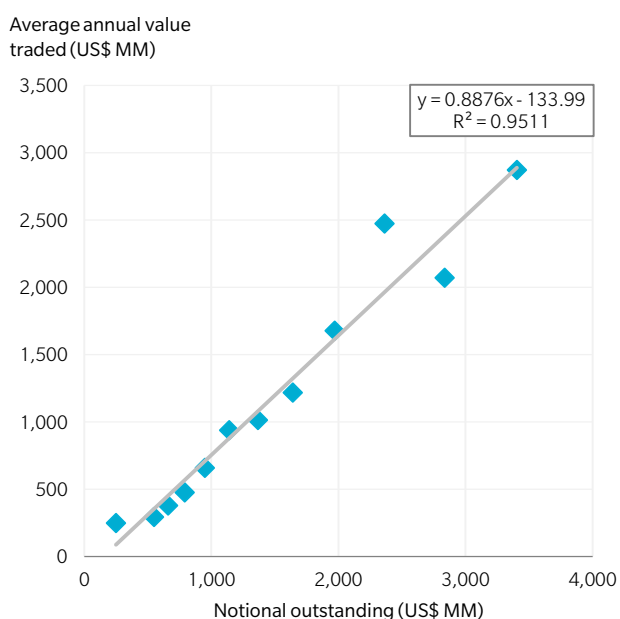
Source: Oliver Wyman analysis

LIQUIDITY IMPACT

Reduced volumes will result in additional costs through higher liquidity premia. Markets will trade at higher bid-ask spreads to reflect the increased liquidity risk given lower volumes. We estimate the additional liquidity costs in scenario A by constructing “liquidity curves” that quantify the relationship between turnover and average bid-ask spreads per instrument. We then apply a market-wide volume shift to estimate the increased bid-ask spreads associated with a lower turnover market. From this we derive the additional liquidity costs as the difference between the pre- and post-FTT bid-ask spreads.

Corporate bond transaction data is limited for European markets. For example, there is no available data about trading volumes for individual corporate bonds. This means we cannot construct a liquidity curve directly from publically available sources. In particular data on trading volumes for individual bonds is not readily available. However there is typically a strong positive correlation between volumes (value traded) and notional outstanding, since larger issues are more actively traded. This relationship can be observed for the US market, where both volume and notional data is available.

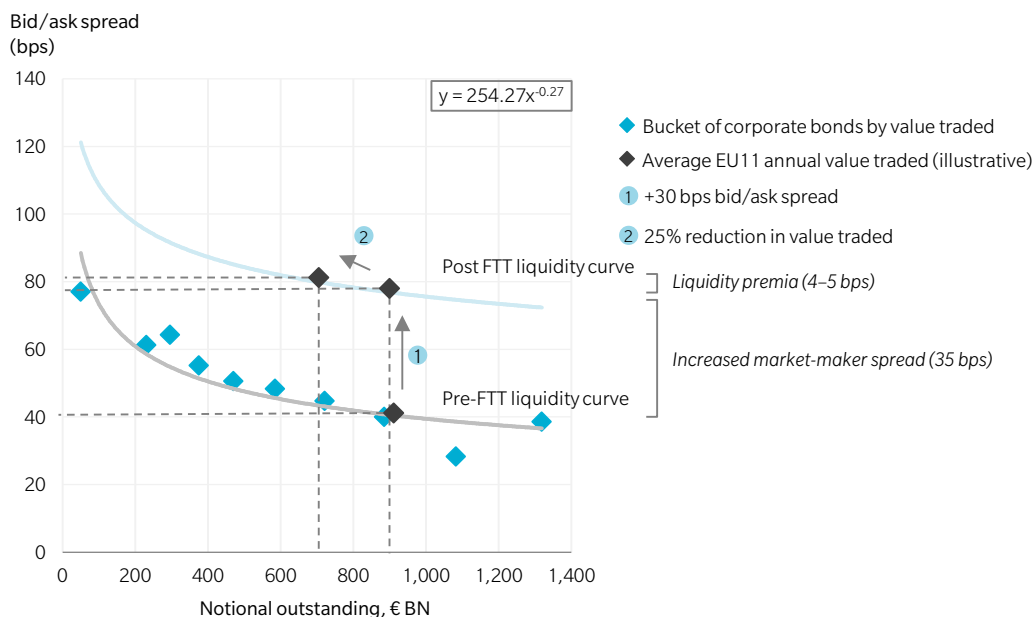
EXHIBIT 25: US CORPORATE BOND MARKETS VOLUME VS. NOTIONAL OUTSTANDING (2012)



Source: FINRA TRACE, Oliver Wyman analysis

Exhibit 26 shows the liquidity curve that would result from applying this approach to the bond markets for EU-11 corporate issuers. This analysis implies that a 25% decline in volumes – proxied here by notional outstanding – would cause bid-ask spreads to increase by 4–5bps.

**EXHIBIT 26: RELATIONSHIP BETWEEN CORPORATE BOND NOTIONAL OUTSTANDING AND BID-ASK SPREADS FOR A SAMPLE OF EU-11 BONDS**

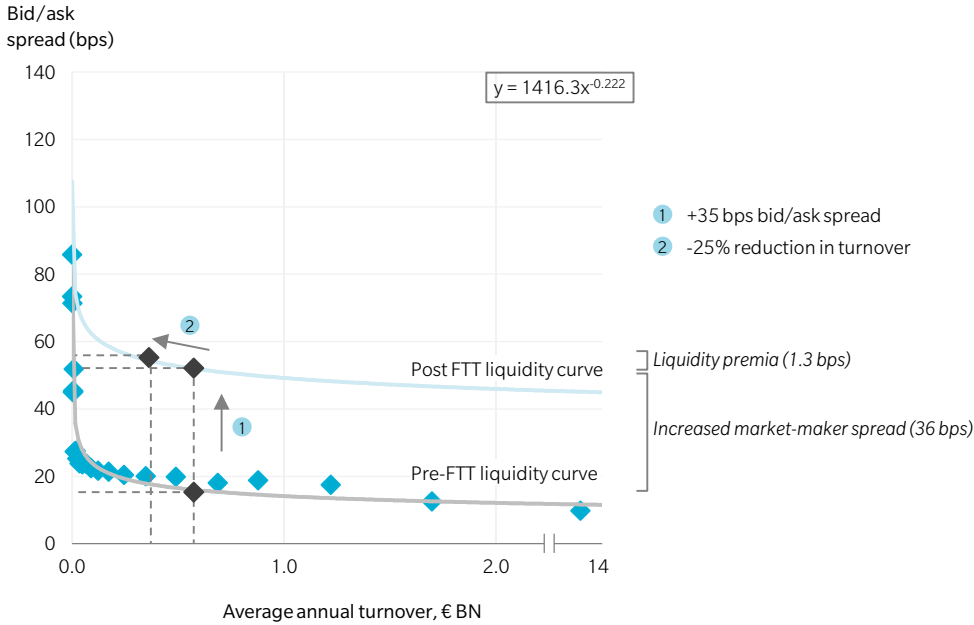


Source: Datastream, Oliver Wyman analysis

Another way to estimate the EU-11 liquidity curve for corporate bonds is to start from the US liquidity curve, which can be constructed from the FINRA TRACE database. Exhibit 27 shows the US liquidity curve constructed from this data. It suggests that in the US market, a 25% decline in corporate bond volumes would drive a liquidity premium of ~1.5bps<sup>53</sup>. There are, however, some important structural differences between the US credit market and the European market. In particular, the US market is a larger and more liquid market, and is characterized by smaller average trade sizes and larger face value instruments. The average outstanding of a corporate bond issue is about €800 MM in Europe but over €1 BN in the US). As a result average bid-ask spreads are lower in the US (about 25bps for investment grade bonds) than in Europe (about 40bps). The effects of reduced liquidity in Europe would likely therefore be higher than in the US, because the relationship between volumes and spreads is not linear, increasing more rapidly as volumes get smaller. Given the range of outcomes consistent with our analysis, we conservatively assume a liquidity premium of 3bps in Scenario A.

<sup>53</sup> We note that running this analysis on the basis of notional outstanding (rather than volumes) yields a very similar result in terms of the implied liquidity premium. This is therefore further support for the use of notional as a proxy for volumes for EU-11 issuers in Exhibit 26

EXHIBIT 27: RELATIONSHIP BETWEEN US CORPORATE BOND TURNOVER AND BID-ASK SPREADS

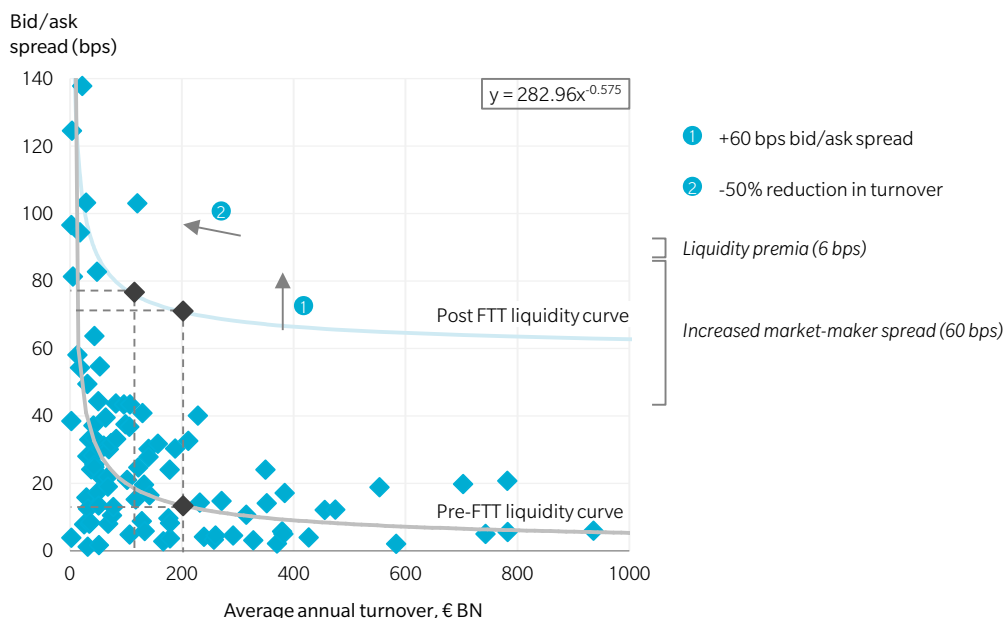


Source: FINRA TRACE, Oliver Wyman analysis

We conduct a similar analysis for EU-11 government bonds to estimate the liquidity premium for these instruments. Although a large number of factors determine the turnover and bid-ask spread of these instruments – including sovereign credit rating, size of issuance and maturity, etc. – we can still observe a strong relationship between turnover and bid-ask spreads. We plot the relationship between bid-ask spread and average annual value traded for a sample of about 100 EU-11 government bonds. The curve is shifted upwards by 60bps<sup>54</sup> to reflect the dealer (and interdealer) FTT costs, which we assume are passed entirely onto the end client. We then show the effect of the 50% decline in volumes on the sample average. The difference between the pre- and post-volume decline bid-ask spread before and after volumes decline is the liquidity premium arising from the FTT.

<sup>54</sup> 60bps is comprised of 10bps dealer tax, plus 20bps for every interdealer trade required to facilitate a single client transaction (we assume that dealers are only willing to participate in interdealer markets if they are fully compensated for the 2-sided FTT costs they will incur). Given approximately 50% of the EU-11 government bond market volumes are represented by interdealer activity (see Exhibit 14), this implies that every dealer-client transaction requires an additional interdealer transaction. Therefore the dealer costs are: 10bps dealer + 20bps interdealer \* 2-sided impact on the bid-ask spread = 60bps.

EXHIBIT 28: RELATIONSHIP BETWEEN GOVERNMENT BOND TURNOVER AND SPREADS<sup>55</sup>



Source: AFME, Datastream, Oliver Wyman analysis

We estimate the market wide liquidity premium for EU-11 government bonds to be 6bps on average. Although the market-wide liquidity impacts are moderate when compared to the direct costs of the FTT, significant variation can be observed at the level of an individual bond in both corporate and government bond markets. For example, a 20 year “off-the-run” Italian government bond of small issuance size (€2.2 BN) would attract a liquidity premium of up to 40bps (vs. 6bps market average).

Bank intermediation is important for the facilitation of the market, representing 30–50% of volumes. To estimate these liquidity costs in scenario B, we consider average bid-ask spreads in similar, lower liquidity markets given this scenario assumes a breakdown in intermediation.

Within corporate bond markets, average bid-ask spreads range from 40bps for investment grade bonds to 90bps for high-yield bonds, and 270bps for distressed debt.<sup>56</sup> We also note that during the 2009 liquidity crisis – a period of exceptionally low liquidity and stressed market conditions, with restricted interdealer activity – spreads rose ~5x for investment grade bonds to an average of 190bps. In the absence of market-makers we would expect corporate bond markets to trade like illiquid markets. To proxy this effect we compare average bid-ask spreads today with those during the stressed liquidity period of February 2009. Investment grade corporate bonds were ~150bps higher than in June 2013, high-yield corporate bonds ~45bps higher, and distressed debt ~325bps higher. While the exact effects of removing significant liquidity providers from the market are unclear, the consensus among dealers we interviewed was that reference to the February 2009 period was a reasonable (yet conservative) proxy. Given the range of outcomes across different corporate bonds types (45–325bps) we use the lower end of this range: ~100bps.

For government bonds, we again start from an examination of similar but less liquid markets. Because EU-11 government bonds are relatively liquid today, with market-wide average bid-ask spreads of ~6bps<sup>57</sup>, we look to the emerging markets to find less liquid parallels. Emerging market government debt markets are significantly less liquid than their EU-11 counterparts, reflecting the higher credit risk, as well as the immaturity of capital markets in these countries and limited market-making activity. In these markets we observe spreads ranging from 17bps in South Africa

<sup>55</sup> Volume data for EU-11 government bonds based on proprietary data from AFME, collected from the largest 14 dealers covering the time period from Jul 2010 – Jun 2011. Bid-ask spreads sourced from Datastream for the same instruments and time period.

<sup>56</sup> Source: IBoxx, 3/07/2013. Sample of 1008 bonds. See Appendix A for further detail

<sup>57</sup> Source: AFME proprietary data submitted by 9 member banks, 2011

to 40bps in Thailand, and as high as 80bps in Argentina.<sup>58</sup> We assume a liquidity premium of 20bps, which is at the low end of this range.

This estimate is supported by analysis of bid-ask spreads of EU-11 government bonds during times of stressed liquidity. We compare average spreads of EU-11 government bonds in June 2013, a period of 'normal' liquidity, with February 2009, a period of stressed liquidity during the financial crisis<sup>59</sup>. On average the stressed liquidity spreads were around 20bps higher than the equivalent spreads for June 2013, with significant variation by instrument. For example, German government bond spreads were 12bps higher in February 2009 than in June 2013, while Austrian bonds were 29bps higher.

Overall, scenario B assumes additional liquidity costs of 20–100bps imposed on market participants, reflecting the loss of bank intermediation, infrequent trading and high information costs.

#### EXHIBIT 29: LIQUIDITY IMPACTS OF THE FTT ON FIXED INCOME MARKETS (2012)

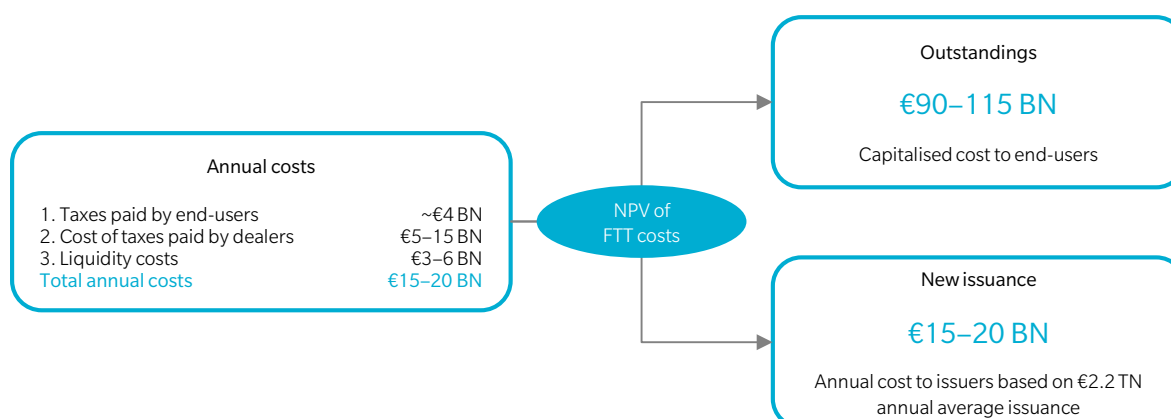
Scenario	Corporate bonds		Government bonds	
	A	B	A	B
Volume decline	-25%	-60%	-50%	-70%
Liquidity premium (bps)	3bps	100bps	6bps	20bps
Cost of liquidity premium	€50 MM	€1 BN	€3 BN	€5 BN

Source: Oliver Wyman analysis

## IMPACT SUMMARY

Overall, the impact of the FTT on EU-11 fixed income markets will be a €100–140 BN one-off reduction in asset values. This loss will be borne by the current holders of these assets – including long-term investors – as investors consider the future FTT costs and price these into asset values when valuing fixed income assets. Long-term investors would bear ~90% of these costs, equating to €90–115 BN. The majority of this impact will be felt in government bond markets, where there are higher outstandings and trading velocity drive high incidence of the FTT, and where loss of interdealer intermediation as a result of the repo market tax drives significant liquidity costs. The loss of intermediation will present long-term investors (and, by extension, retail investors) with a material reduction in consumer choice. This runs counter to other regulatory initiatives at an EU-level such as MiFID and MiFIR.

#### EXHIBIT 30: SUMMARY OF FTT IMPACTS FOR EU-11 FIXED INCOME SECURITIES



<sup>58</sup> Hund, J., Lesmond, D., Liquidity and Credit Risk in Emerging Debt Markets, 2008

<sup>59</sup> Source: IBoxx/Markit. See Appendix A for detailed spread data by country

For bond issuers – EU-11 corporates and governments – the impact will be felt via increased cost of capital on new issuance. This cost represents some €25–35 BN in annual costs for issuers, as increased yields are demanded to compensate for the increased transaction costs, in these markets. The exact yield impact will vary considerably by security based on the maturity, face value, turnover velocity, rating, and other factors. On average, we estimate a 3–5% increase in yields on EU-11 corporate bonds (+10–20bps per annum), and a 10% increase in yields on government bonds (+20–30bps per annum). We note, however, that the 3–5% yield increase for corporate bonds may be a conservative estimate given the use of government bonds as a pricing benchmark. Corporate bonds are typically priced relative to a government bond reference pricing curve, with yield typically expressed as a ‘spread’ over the benchmark yield. If the benchmark yield increases, we would expect corporate bond yields to increase further.

*“The FTT will make the Eurobonds market fundamentally less attractive for capital raising”*

Global consumer goods company

#### EXHIBIT 31: IMPACT OF FTT ON FIXED INCOME YIELDS, WORKED EXAMPLE

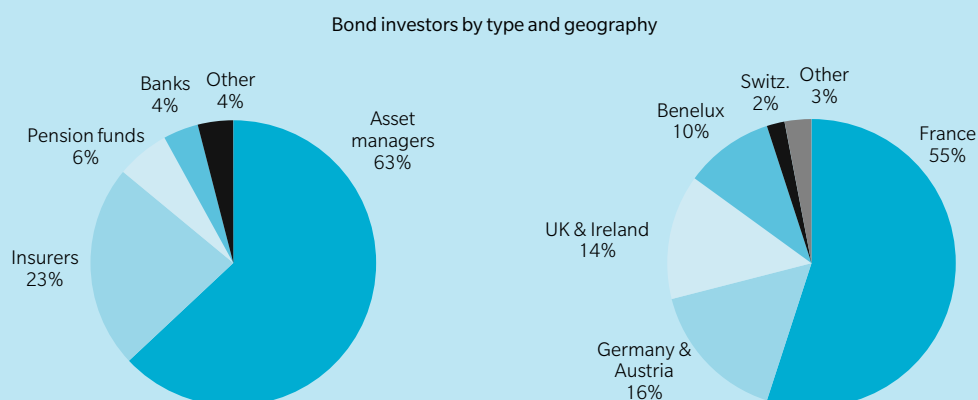
	Corporate bonds		Government bonds	
	Scenario A	Scenario B	Scenario A	Scenario B
Maturity	6.7	6.7	4.0	4.0
Annual coupon rate	3.22%	3.22%	2.45%	2.45%
Bond price given DCF	99.4	99.0	98.9	99.2
Redemption value (% of Face Value)	100	100	100	100
New yield demanded	3.32%	3.39%	2.73%	2.66%
Yield delta (bps)	0.11%	0.18%	0.28%	0.20%
% increase in yields	3%	5%	11%	8%

## CASE STUDY: AUCHAN 10 YEAR BOND ISSUANCE

Groupe Auchan SA<sup>60</sup> is a privately-held French retailer, with about ~3,000 supermarket outlets globally and almost 300,000 employees. Auchan has a significant presence in Europe, with operations in France, Spain, Italy, Portugal and Eastern Europe.

As part of Auchan's expansion across the EU, in 2012 it entered into a €1.1 BN transaction to purchase 91 hypermarkets in Central & Eastern Europe from the German Metro Group. The transaction was funded mainly by a €750 MM bond issuance by Group Auchan SA, with a maturity of 10 years and a coupon of 2.375%. The issue was well subscribed by long-term investors, with good participation from asset managers and insurers, particularly in France and other EU markets.

### BOND INVESTORS BY TYPE AND GEOGRAPHY



Source: Dealogic, Oliver Wyman Analysis

Based on the methodology outlined in section III, we estimate that the FTT could have resulted in additional costs to investors of €750 K–€1.3 MM per annum. To compensate for this, investors would have demanded a higher yield of 10–20bps from Auchan, increasing annual interest costs by €750 K–€1.3 MM<sup>61</sup> and potentially challenging the economics of this transaction.

<sup>60</sup> Note: this case study is based solely on public data and Oliver Wyman analysis. It does not represent the opinions of the named company, who has not been contacted in the preparation of this report.

<sup>61</sup> Key input parameters into the calculation are the turnover of Auchan's bond and the transaction costs on this turnover. Turnover is based on average turnover velocity of French corporate bonds (0.7x p.a.), and an assumed volume declines in line with the market-wide volume decline assumption (25% in Scenario A, 60% in Scenario B). Transaction costs are increased due to direct taxes to investors and taxes passed on by market makers (resulting in an effective tax rate of 19.2bps), as well as due to higher liquidity premia—for Auchan assumed to be the average for corporate bonds (3bps in Scenario A, 100bps in Scenario B).



## 6. IMPACT ON DERIVATIVES MARKETS

*In derivatives markets, corporates and long-term investors will face a €5–15 BN increase in the annual cost of managing their risks – including the foreign exchange, interest rate, credit and commodity price risks they incur in their daily business activities. Many participants may reduce hedging activity as derivatives transaction costs increase up to 80x. Others will term-out derivatives activity moving to longer-dated instruments with less flexibility. Reduced hedging activity leads to increased earnings volatility for corporates and investors. The derivatives FTT creates a major competitive dislocation in the market in favour of non EU-11 banks given lower interdealer costs by effectively making EU-11 domiciled banks uneconomical counterparties.*

### MARKET STRUCTURE – OTC AND LISTED DERIVATIVES

We focus our analysis of derivatives markets on EU-11 end-user activities in the core markets of OTC interest rate derivatives, FX derivatives and listed derivatives. These products represent ~95% total global notional outstanding, and are the instruments most often used by end-users for risk management purposes.

Derivative markets are used by a variety of end-users for daily and termed hedges and risk management. For example:

- A German manufacturer imports aluminium from Russia for use in production, with payment due in Rubles (RUB) and uses a currency forward to “lock-in” the exchange rate and a listed aluminium contract to hedge against a rise in the price of aluminium
- A French services firm receives a floating rate loan from a bank and enters into an interest rate swap to pay a fixed rate of interest to hedge a rise in interest rates
- A pension fund uses an FX futures portfolio to manage the risk of currency movements and potential asset / liability mismatch
- An asset manager of a Riester savings plan uses interest rate futures to rebalance portfolio durations on a daily basis to adjust the asset and liability (ALM) profile of the fund and to provide guaranteed income for retirees

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*“80% of our derivatives activity is short-dated vanilla FX hedging of our working capital and supply chain currency risks – these transactions are unavoidable”*

Global consumer goods company

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The key driver behind these markets is end-user risk management. End-users, whether corporate or investors, are not in the business of running risk management. Derivative markets allow corporates and investors to hedge unwanted risk exposures efficiently and focus on core business activities. For flexibility, investors and sophisticated corporates tend to use short dated (sometimes daily) OTC and listed contracts to hedge risk. Our interviews confirmed this with one asset manager we interviewed turns over its derivatives portfolios 10–30x per annum, while it turns over its bond investments only 1–2x per annum. This high turnover typically relates to non-discretionary ALM activities, such as rebalancing a portfolio in response to new investor subscriptions or redemptions. Derivatives provide a cost-effective and flexible tool for adjusting portfolio exposures.

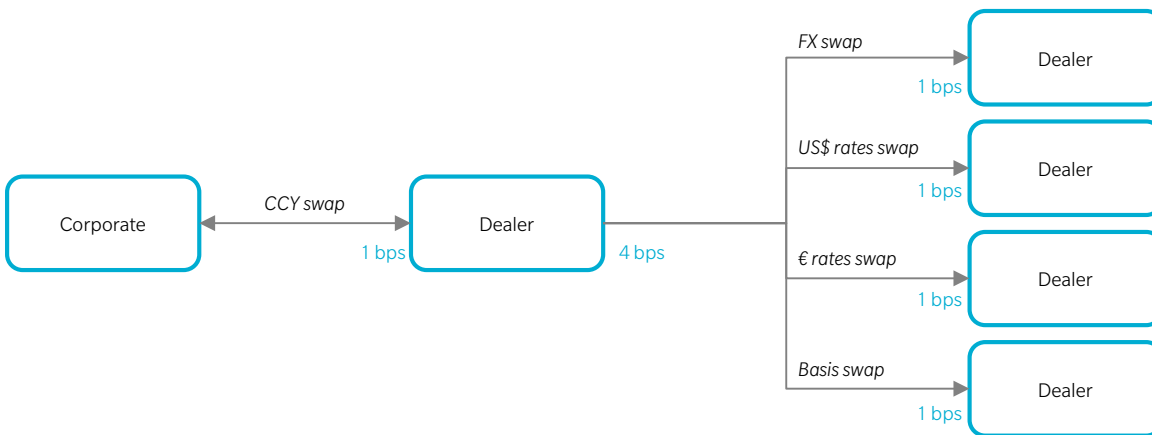
## COMPETITIVE DYNAMICS

Executing a single client trade typically involves several interdealer transactions as the dealer decomposes the risk and hedges in the interdealer markets. The bespoke nature of many end-user transactions requires the dealer to intermediate and decompose this risk to properly hedge its own resulting exposure. Exhibit 32 illustrates this cascade effect:

*“Derivatives are critical to managing the complex risks arising throughout our supply chain, from sourcing of raw materials, through to international sales in local currency”*

European industrials company

EXHIBIT 32: ILLUSTRATIVE CASCADE EFFECT IN DERIVATIVES MARKETS



Source: Oliver Wyman analysis

A European corporate issuing a 10 year fixed rate dollar-denominated bond (to attract US investor pools) may wish to reduce its exposure to currency fluctuations. The corporate will buy a cross-currency swap (taxed at 1 bp on the dealer side) which is a hybrid interest rate and foreign exchange derivative tailored to fully hedge both the currency and interest rate risks of this capital raising. To facilitate this, the dealer will decompose and hedge this risk in interdealer markets to deliver a risk-neutral position. In this case it requires four additional interdealer transactions:

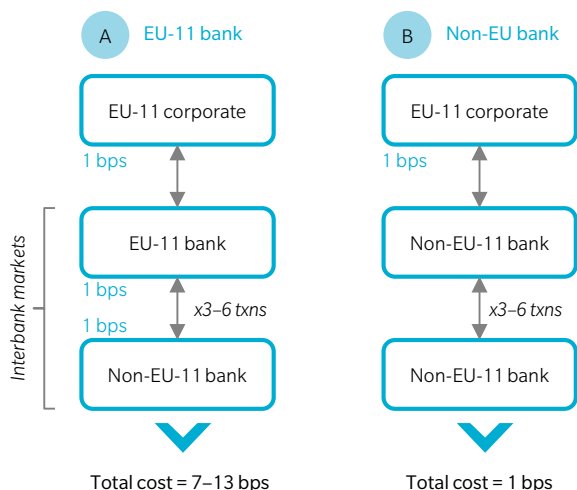
1. An FX swap of US Dollars to Euros to allow the proceeds to be used by the corporate
2. A Euro interest rate swap from fixed to floating rates exposure
3. A US dollar interest rate swap from fixed to floating
4. A basis swap to hedge the basis risk between the interest rate and FX exposure differential.

Across the chain, this requires a minimum of five taxable transactions on the notional traded, equating to a tax 9x the headline rate. For non-linear transactions (e.g. with optionality, such as a put/call option) the interdealer multiple may be many times this. Therefore, the “cascade effect” in derivatives markets – although somewhat different to the securities cascade – drives total tax incidence many multiples higher than the headline rate.

Our estimates assume that OTC derivative markets will not be covered by the “issuance principle” and therefore transactions between two non EU-11 institutions will not be taxed under the FTT<sup>62</sup>. This means that EU-11 banks will be at a competitive disadvantage to other banks which are not in the EU-11. For a client transaction requiring 3–6 additional interdealer trades, this means an EU-11 bank will be taxed 7–13x a UK or Swiss bank on the same transaction.

<sup>62</sup> However, we note that exchange-traded derivatives would be captured under the ‘issuance principle’ based on location of the exchange

### EXHIBIT 33: ILLUSTRATION OF DERIVATIVES TRANSACTION CHAINS



This represents a significant competitive distortion in the market in favour of non EU-11 banks who will be able to offer much more competitive pricing on the initial derivative due to the lower incidence of tax down the chain (1–2bps rather than 7–13bps). We expect four main effects:

- EU-11 banks will exit the interdealer market, and become price-takers purely for the purposes of hedging their own risk
- EU-11 clients will migrate their derivatives business to non EU-11 dealers. A number of EU-11 end-users we interviewed confirmed that they are looking to move derivatives business to the UK or Switzerland to avoid increased costs
- EU-11 banks, following the loss of derivatives revenues, will re-price lending products to mitigate this loss

- Smaller EU-11 corporates and investors will face higher costs of risk management as they are unable to access international capital markets to the same extent as larger, more sophisticated corporates

*“We would migrate our derivatives trading activity to London or Luxembourg and cease trading with EU-11 banks”*

Global consumer goods company

## DIRECT IMPACT

Derivatives markets represent about €500 TN notional outstanding globally, but annual turnover velocity varies dramatically across products, ranging from 1.4x per annum for OTC interest rate derivatives to 21x per annum for FX derivatives. The variation is largely explained by the duration profile of each market, with the FX market skewed towards shorter durations (only 2% FX forwards have a duration of greater than a year<sup>63</sup>). Given that the FTT is levied on notional turnover, this is of significance in determining the taxable base.

### EXHIBIT 34: DERIVATIVES NOTIONAL TURNOVER (€ TN, 2010)

	OTC derivatives		Exchange-traded derivatives		
	Rates	FX	Rates	FX	Equities
Global	518	630	1,311	30	187
EU-11 end-users	26.4	23.2	161.3	0.1	7.1
Of which:					
• Corporates	11.0	11.6	42.6	<0.1	1.5
• Asset managers	8.0	9.4	95.2	<0.1	4.1
• Pension funds	2.5	0.8	7.2	<0.1	0.8
• Insurers	4.9	1.4	16.3	<0.1	0.6

Source: Bank for International Settlements, Oliver Wyman proprietary data and analysis

In calculating the direct impact, we assume that the EU-11 interdealer market ceases to exist, and that all derivatives activity that can migrate to non EU-11 jurisdictions, such as London and Zurich, does so<sup>64</sup>. This would limit the “cascade” for OTC derivatives given because all interdealer activity would be untaxed (as between non EU-11

<sup>63</sup> Source: Bank for International Settlements (2010), “Triennial Bank Survey – Foreign Exchange and Derivatives Market Activity in April 2010”

<sup>64</sup> This is a simplified assumption for the purposes of calculation. As noted above, we believe some derivatives business with EU-11 dealers will continue to the extent that they are able to absorb interdealer costs, or to the extent that clients are not able to migrate business

counterparties). As a result, the tax incidence would be 2bps for financial institutions and 1bp for non-financials. Again, we assume that market-makers pass on all sell-side transaction costs via widened bid-ask spreads.

The reduction of transactions in derivatives markets is greater than in securities markets<sup>65</sup>, due to the greater increase in transaction costs and ease of migrating transactions out of EU-11 jurisdictions.

To illustrate this we provided worked examples for FX forwards (Exhibit 35) and interest rates swaps (Exhibit 36). These demonstrate the multiple on pre-FTT transaction costs. For a 1 week EUR/USD FX forward between a dealer and an EU-11 financial institution, the FTT would increase transaction costs 2.5x. For a 5 year EUR/USD FX forward this would increase by 1.1x. In FX markets, the majority of forwards trade at the highly liquid, short dated end of the market. About 45% of forwards are less than 1 month and ~95% are less than 6 months<sup>66</sup>. This skew is even greater for FX Swaps, with 75% of swaps less than 1 week, as shown in our 2012 study into the impact of the FTT on FX markets.<sup>67</sup>

#### EXHIBIT 35: INCREASE IN TRANSACTION COSTS FOR EUR/USD FX FORWARDS

EUR/USD forwards	1 week	1 month	6 month	12 month	2 years	5 years
Dealer buys (€MM)	25	25	25	25	25	25
End-user Buys (\$MM)	33.2	33.2	33.2	33.2	33.2	33.2
EUR/USD mid-rate	1.3265	1.3265	1.3265	1.3265	1.3265	1.3265
Pre-FTT costs						
• Spread to mid (pips)	1.8	1.9	2.3	3.0	7.7	25.8
• Current cost per transaction (\$)	4,500	4,750	5,750	7,500	19,250	64,625
• Current cost per transaction (€)	3,393	3,581	4,335	5,654	14,512	48,720
• # annual transactions	52	12	2	1	0.5	0.2
Transaction cost p.a. (€)	176,411	42,972	8,670	5,654	7,256	9,744
Post-FTT costs						
• Annual tax costs – Non-FI (€)	130,000	30,000	5,000	2,500	1,250	500
• Annual tax costs – FI (€)	260,000	60,000	10,000	5,000	2,500	1,000
New cost p.a. – Non-FI	306,411	72,972	13,670	8,154	8,506	10,244
New cost p.a. – FI	436,411	102,972	18,670	10,654	9,756	10,744
Cost increase – Non-FI	1.7x	1.7x	1.6x	1.4x	1.2x	1.1x
Cost increase – FI	2.5x	2.4x	2.2x	1.9x	1.3x	1.1x

Source: BIS, Datastream, Oliver Wyman analysis

The impact on interest rate swaps markets is even greater. For a 1 week Euro interest rate swap between a dealer and an EU-11 financial institution, the FTT would increase transaction costs 83x on an annualised basis. For a 5 year swap, this multiple reduces to 1.3x the pre-FTT transaction costs.

<sup>65</sup> The EC expects a 75% decline in derivatives volumes and a 15% decline in securities volumes.

<sup>66</sup> Source: BIS triennial survey 2010

<sup>67</sup> Oliver Wyman, Proposed EU Commission Financial Transaction Tax Impact Analysis on Foreign Exchange Markets (2012)

## EXHIBIT 36: INCREASE IN TRANSACTION COSTS FOR EUR INTEREST RATE SWAPS

EUR interest rate swaps	1 week	1 month	6 month	12 month	2 years	5 years
Notional (€MM)	25	25	25	25	25	25
Pre-FTT costs						
• Spread to mid (bps)	1.3	1.3	1.3	1.3	1.3	1.3
• Cost per transaction (€)	61	264	1,581	3,162	6,500	15,813
• # annual transactions	52	12	2	1	0.5	0.2
Transaction cost p.a. (€)	3,162	3,162	3,162	3,162	3,250	3,163
Post-FTT costs						
• Annual tax costs – Non-FI (€)	130,000	30,000	5,000	2,500	1,250	500
• Annual tax costs – FI (€)	260,000	60,000	10,000	5,000	2,500	1,000
New cost p.a. – Non-FI	133,163	33,163	8,162	5,662	4,500	3,663
New cost p.a. – FI	263,163	63,163	13,163	8,162	5,750	4,163
Cost increase – Non-FI	42.1x	10.5x	2.6x	1.8x	1.4x	1.2x
Cost increase – FI	83.2x	20x	4.2x	2.6x	1.8x	1.3x

We expect the sharp increase in transaction costs at the short end of the market to render transactions of maturities less than 6 months unviable for EU-11 dealers to facilitate. For FX forwards, we estimate that ~85% EU-11 counterparty volumes less than 1 week would disappear, and ~65% of volumes on maturities between 1 week and 1 year. For interest rate swaps, given the higher multiple on pre-FTT transaction costs, we expect 85% volumes less than 1 year to disappear. The majority of these volumes will migrate directly to non EU-11 dealers not subject to the cascade effects of the tax. The remainder of volumes are expected to “term-out”: that is, where investors will use longer-term instruments to meet their hedging needs.

*“We have unavoidably high turnover of derivatives – we use futures to extend/shorten the duration of our cashflows to adjust for retail investors redemptions/inflows – we cannot move to a pure ‘buy-to-hold’ model”*

German asset manager

This drives an overall market-wide volume decline of 30–50% for FX forwards, and 40–60% for interest rate swaps. The declines for EU-11 counterparties – those directly impacted by the tax – will be higher (75–80%). However, given the global nature of OTC derivatives markets, the market-wide effect is more muted. The total direct impact (post volume reductions) is €5–15 BN for EU-11 end-users, depending on magnitude of volume reduction.

## EXHIBIT 37: DIRECT IMPACT ON EU-11 DERIVATIVES TRADING

	OTC rates	OTC FX	Exchange-traded
EU-11 end-user turnover	€27 TN	€23 TN	€168 TN
Volume decline	60–90%	70–90%	60–90%
Post-volume decline turnover	€4–12 TN	€2–7 TN	€24–70 TN
Total direct taxes	1.58bps	1.5bps	1.74bps
Direct costs	€0.6–1.8 BN	€0.3–1 BN	€4–13 BN

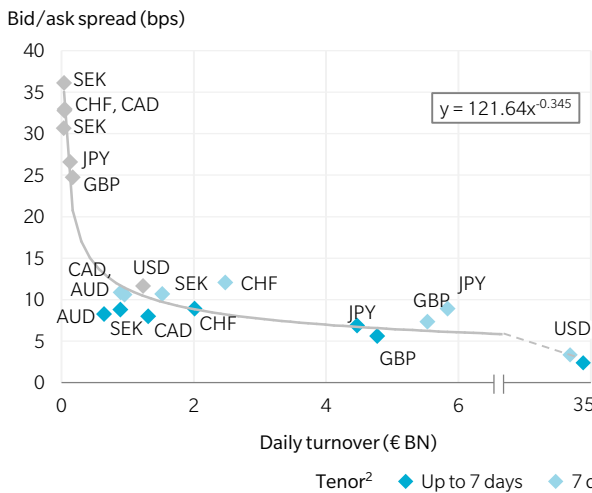
Source: BIS, Oliver Wyman proprietary data and analysis

## LIQUIDITY IMPACT

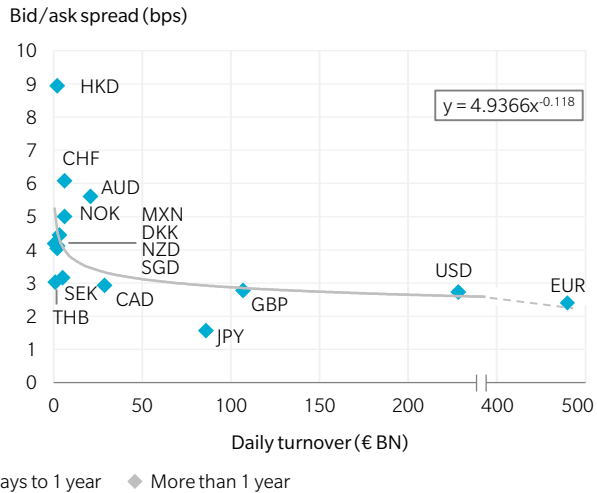
As with securities markets, we construct liquidity curves for key derivatives products – FX forwards and interest rate swaps – based on the average turnover and bid-ask spread for a broad range of instruments across currency pairs and tenors. These liquidity curves allow us to proxy the expected increase in bid-ask spreads resulting from market-wide volume declines.

### EXHIBIT 38: FX FORWARD AND INTEREST RATE DERIVATIVES LIQUIDITY CURVES

EUR/other currency FX forwards  
Bid/ask spread vs. turnover, 2010



Interest rate swaps, major currencies  
Bid/ask spread vs. turnover, 2010



Source: BIS, Datastream, Oliver Wyman analysis

For FX forwards the volume declines will result in a weighted average increase in the liquidity premium of 0.7–1.1 bps. For interest rate swaps the liquidity premium increase is 0.15–0.3bps.<sup>68</sup> Again, there will be significant variation among instruments and maturities. The liquidity premium increase for a EUR/AUD FX forward longer than 1 year could be as high as 9bps. The widening of bid-ask spreads to reflect reduced liquidity is passed on to all market participants as a cost of decreased market efficiency.<sup>69</sup>

## SUMMARY IMPACTS

In sum the FTT on derivatives will drive higher costs of risk management for EU-11 end-users; we estimate €5–15 BN in annual costs ‘all-in’ across OTC rates, FX and exchange-traded derivatives. Additional costs will be faced hedging commodity, equity and credit risks, therefore our estimate remains conservative. Our estimated impact does not quantify the cost of not hedging. For EU-11 end-users, the total impact equates to €130–180 TN of un-hedged risk exposure. We expect to see a significant rise in earnings volatility across EU-11 corporates and investors as a result of these potentially un-hedged risk exposures.

Additionally, the FTT will lead to an un-level playing field across the European banking sector, driving business towards the non EU-11 banks and drying up EU-11 interbank markets.

Our analysis remains conservative – given its focus on end-user volumes – and we expect that the impacts on dealer volumes and market structure may drive greater end-user impacts. Dealer volumes will also be impacted and we note that they are instrumental in underpinning functioning markets and supporting market liquidity. Declines in dealer derivatives activity will also have impacts on government bond market turnover as dealers have reduced demand for derivatives hedges (a major driver of dealer activity in government bond markets).

<sup>68</sup> See Appendix A for detailed liquidity impact tables by instrument/tenor

<sup>69</sup> We assume a consistent liquidity premia within asset classes (e.g. we apply the FX forwards premia to FX swaps), given lack of available data for other products.

## WORKED EXAMPLE

The anonymous nature of secondary markets means that a public case study of a derivatives transaction is not possible. So instead we use a hypothetical but typical example. We will utilise a worked example of a ‘typical’ hedging transaction to illustrate both the tax implications of a typical transaction as well as the competitive impacts on EU-11 dealers.

A German mid-market industrial requires long-term financing due to its manufacturing and sales cycle. To diversify its investor base and ensure necessary demand, it issues a \$100 MM fixed rate USD 7 year bond. To transfer the proceeds back into Euros and hedge the USD payment exposure the corporate enters into a cross-currency swap. A single cross-currency swap with the corporate is actually a four leg trade for the dealer to replicate the swap in traded markets. The steps are:

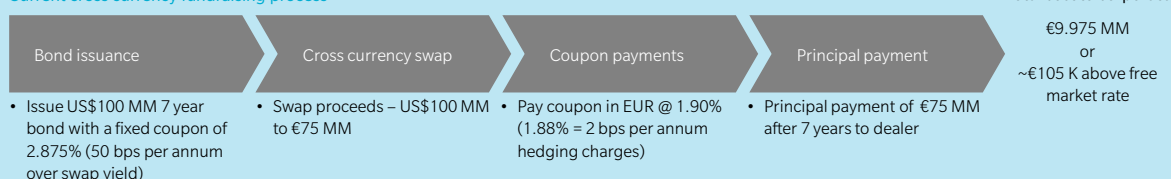
1. A EUR interest rate swap – Dealer pays fixed EUR in the market and receives floating 6 month EUR
2. A EUR basis swap – Dealer pays floating 6 month EUR in the market and receives floating 3 month EUR
3. A cross currency basis swap – Dealer pays floating 3 months EUR in the market and receives floating 3 month USD
4. A USD interest rate swap – Dealer pays floating 3 month USD in the market and receives fixed USD

Following the swap, the dealer takes on the responsibility for the USD denominated coupon payments and receives EUR denominated coupons from the corporate. The dealer manages its risk by maintaining positions across the portfolio of swaps. For major currencies (EUR, USD, JPY, GBP, etc.) the hedge portfolio turns over ~3x across all cross-currency swaps and ~7x in interest rate swaps. Overall this equates to an average portfolio turnover of 4–5x in major currencies and up to 10x in minor currencies.

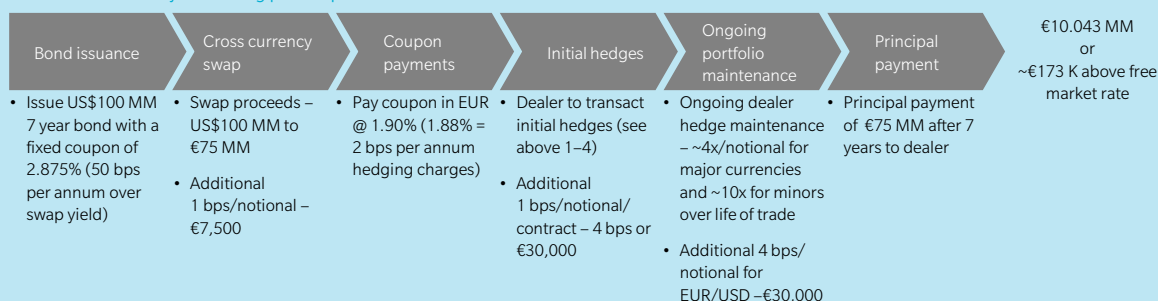
The introduction of the FTT will require the dealer to pass through the initial hedge and ongoing portfolio costs relating to the tax. This will increase the fees for financing (i.e. those over and above the swap curve free rate) by ~8–15x today’s rates.

## BOND INVESTORS BY TYPE AND GEOGRAPHY

### Current cross currency fundraising process



### Current cross currency fundraising process post FTT



Source: AFME member input, Oliver Wyman analysis

In this example, in a major currency we estimate that the FTT would add ~65% to the end-user’s transaction cost. The majority of this increase is the passed on cost of taxes arising in the interdealer market. We expect that financing activities for EU-11 corporates will migrate away from EU-11 banks as corporates reduce the tax impact by transacting derivative transactions with counterparties who are not subject to the FTT on interdealer trades. This effectively shuts down the interdealer markets for EU-11 dealers dealing with non-EU dealers.

## SUMMARY IMPACTS

The FTT on derivatives will increase the cost of risk management for EU-11 end-users. We estimate €5–15 BN in annual costs across OTC rates, FX and exchange-traded derivatives. We have not included the additional costs that will be faced by those hedging commodity, equity and credit risks, so our estimate of total costs is conservative. We also expect to see a significant rise in earnings volatility across EU-11 corporates and investors as they decide to leave a larger portion of their risk exposures un-hedged.

The FTT will put EU-11 banks at a competitive disadvantage to other banks, driving derivatives business outside the EU-11, and especially to Switzerland and the UK.



## 7. IMPACT ON REPO MARKETS

Repo markets are of critical importance as a liquidity management tool for investors and dealers, and in underpinning securities and derivatives markets through funding and provision of hedging instruments. We expect repo instruments with maturities less than one year to no longer be viable as the FTT increases transaction costs by up to 1500x pre-FTT costs. Maturities will become longer but the more important effect will be the disappearance of most repo transactions in the EU-11. Some terming out of durations is expected, but the bulk of the market will disappear, with knock-on impacts on fixed income markets. Long-term investors will face “duration management” challenges, and will be forced to revert to uncollateralised deposits for cash management, increasing concentration risk.

### MARKET STRUCTURE

The €5.6 TN<sup>70</sup> European repo market is an important source of liquidity, funding and cash management market participants, for both end-users and dealers. These uses can be summarised as follows:

End-users	Dealers
<ul style="list-style-type: none"> <li>Liquidity management (on a secured basis)</li> <li>Yield enhancement on long-term, highly-rated assets</li> <li>Access to highly-rated collateral for OTC clearing</li> </ul>	<ul style="list-style-type: none"> <li>Funding of market making and primary market underwriting risk</li> <li>Hedging of market making and primary market underwriting risk</li> <li>Liquidity buffer management</li> <li>Access to inventory and collateral</li> </ul>

The repo market is defined by its short dated nature. These instruments have very tight pricing with low transaction costs relative to their notional value. Spreads on repo transactions for highly-rated government bond collateral (e.g. German bunds) are typically 2–5bps on a short-dated transaction; transaction costs for an overnight repo could be as low as ~€1.50 on notional of €1 MM. The majority of repo transactions are from overnight to <6 months. A market for repos out to 12 months does exist but with very low liquidity due to the preference for flexible shorter term financing.

*“The repo market is highly efficient today and a critical source of secure cash management for our treasury operations”*

Global consumer goods company

### FIRST ORDER IMPACT

The tax on repo markets is likely to substantially reduce volumes, particularly of short-dated instruments. The planned 20bps tax on an overnight repo with notional of €1 MM would amount to, €2,000. The post-FTT transaction cost would therefore be 1441x the pre-FTT transaction costs<sup>71</sup>. The extent of the effect is smaller for longer-term repo transactions, because the tax pays no heed to maturity. A 12 month repo on highly-rated government bond collateral would face a ~5x increase in transaction costs. The impact of the FTT is significantly greater on shorter duration repos, given the fixed tax on notional (in other words, on the example transaction, the tax is €2,000 regardless of duration). These cost multiples are outlined in the below table below, (based on analysis presented by the International Capital Market Association (ICMA) and the European Repo Council (ERC)):

<sup>70</sup> Source: ICMA European repo market survey, December 2012

<sup>71</sup> Pre-FTT costs are ~€1.50

## EXHIBIT 39: POST-FTT TRANSACTION COST MULTIPLE BY DURATION AND COLLATERAL TYPE

	Pre- FTT Bid-ask spread (bps)		
	5bps	10bps	15bps
1D	1,441x	721x	481x
1W	209x	105x	70x
1M	49x	25x	17x
3M	17x	9x	6x
6M	9x	5x	4x
12M	5x	3x	2x

Source: ICMA, Oliver Wyman analysis

The ICMA estimates that spreads on an overnight repo would need to widen to ~72% (7200bps) in order to recover the tax. Given this, they conclude that the FTT will effectively terminate the <6 month repo market, with substantial impacts on repo markets <12 months. This is particularly significant since repos <6 months now accounts for ~99% of European market turnover<sup>72</sup>. The European Commission also expects much of the repo market to disappear, to be replaced by secured deposits and central bank repo.

## IMPACTS ON END-USERS

The termination of the repo market <6 months (and substantial increase in costs for 6–12 month repo), will present material challenges for end-users. Repos allow investors and corporates to earn yield on cash deposits short-term, while maintaining short-term access to cash reserves for liquidity management purposes. They provide an attractive and secure alternative to bank deposits, and allow the investor to limit their concentration risk to banks. Because repos are typically used to maintain short term access to funds, increasing the term of repos is not an option for most investors. These investors are largely unable to term-out their repo transactions to mitigate the tax impact; most are short-term by definition to maintain ready access to cash for operational or exception needs.

*“We could not term out our repo and money markets activity – by definition we require access to short-term liquidity”*

Global consumer goods company

For example, a multinational corporate we interviewed transacted only in repo instruments less than 1 month in maturity, and stated that they would be unable to increase these maturities because the firm’s liquidity management policy that requires access to cash investments within 28 days. In response to the FTT, the company was considering relocating their treasury centre outside the EU-11, and using non EU-11 collateral, in order to mitigate the impact.

We considered the Commission’s suggestion that secured lending would be a viable alternative to repo markets for institutional and corporate investors. However, a number of investors we spoke to expressed two key concerns about the functioning of this alternative:

- **Legal enforceability of collateral:** Repos can offset the market value of the collateral against any exposure in the event of default (independent of any administration proceedings). By contrast, in the event of a bank default its depositors remain creditors and they must recover their money through administration proceedings, even when the deposit is secured against collateral
- **Standardised documentation:** repo markets operate under standardised documentation as opposed to the bilateral legal documentation required to establish the nature and terms of the secured lending agreement

Overall, end-users we interviewed agreed that the impact of the repo market tax would damage the mechanisms in place to manage short-term cash and liquidity needs.

<sup>72</sup> Source: ECB money market survey

## IMPACT ON DEALERS

We expect the FTT to substantially reduce banks' ability to facilitate repo market transactions or access short term repo financing markets themselves. This would represent a material challenge to the functioning of primary and secondary markets, particularly for fixed income markets.

We expect three significant impacts on dealers:

- **Funding:** Absent repo markets as a funding source, dealers will need to fully fund client orders in government bonds (and other securities available for repo) with existing liabilities, increasing facilitation costs
- **Facilitation:** Dealers will no longer be able to borrow securities in the market to facilitate client buy orders, requiring them to maintain larger and more costly inventory (or to reduce activity)
- **Primary market syndication:** Primary Dealers of government bonds markets, and underwriters of corporate bond markets, will no longer be able to use repos to fund new issuance during syndication, requiring full balance sheet funding of new issuance

We expect banks' increased funding costs to feed through to end-users via increased transaction costs and liquidity premia in securities markets, and increased spreads in derivatives markets, reflecting the increased funding costs. We expect more settlement failures as market-makers may be unable to source assets to meet client requirements.

## 8. CONCLUSION

### 8.1. CORPORATES

The FTT will drive up the capital costs and risk management costs of EU-11 corporates. Marginal investment projects could be terminated as a result, reducing investment in infrastructure, growth and acquisition. Some corporates will bear increased risk management costs, while others will choose to bear greater balance sheet risk instead, leading to more earnings volatility.

#### INCREASED COST OF CAPITAL

- Equity issuances (IPOs and follow-on issues) will suffer from lower valuations as rational investors capitalise the future forecasts FTT costs into asset values. This will reduce market capitalisation by 6–8% and increase the cost of equity for corporates (impacting existing market capitalisation)
- Debt financing will also be hit as investors demand increased yields to compensate for the (capitalised) costs of the FTT. We estimate this will add 10–20bps per annum to corporate bond yields, with significant variation across issuers. Sub-investment grade issuers may see significantly higher yields
- In total this represents €7–8 BN in additional annual financing costs to be borne by EU-11 corporates. Our estimates remain conservative, however, as we do not model the impact on short-term debt instruments, such as commercial paper and medium-term notes
- A number of corporate treasurers we interviewed predicted that the increased cost of capital would render some investment projects unviable. Some investment in infrastructure projects is likely to be cancelled. One corporate we spoke to told us that the increased cost of capital during the financial crisis had led to cancellation of a large-scale renewable energy project, and expected similar effects from the FTT

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*“We expect the FTT to increase our cost of capital and may lead to some projects being unviable”*

European energy company

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#### IMPACTS ON RISK MANAGEMENT ACTIVITIES

- The FTT will add significant costs to corporates’ risk management activities, with a total effective tax rate of 1–7bps on notional traded, varying with the counterparty and the extent to which banks pass on transaction costs). This will cost EU-11 corporates an additional €1–3 BN per annum in risk management costs
- We expect significant increases in transaction costs, particularly at the shorter end of the market. The transaction cost of a 1 week EUR/USD FX forward will increase 2.5x, and the transaction cost of a 1 week EUR interest rate swap increase will see a >80x increase in transaction costs. Because the derivatives market is heavily weighted towards short duration instruments, the transaction-level impact is expected to be significant
- While some of this derivatives activity (and, hence, cost) is unavoidable, we expect a sharp reduction in the number of transactions involving EU-11 counterparties and some increase in the average maturity of traded derivatives. More risks will go un-hedged and risks will increase earnings will become more volatile (and in extreme cases may lead to bankruptcy)
- Taxation of intra-group derivatives transactions is particularly damaging and costly for corporates. Many European multinationals maintain a Group Treasury function to consolidate risks across their global operating companies. These inter-company trades are typically used to centralise currency risk arising from business flows such as (supply chain payments or sales to clients in foreign currency). Since inter-company transactions will also be taxed, this could double the impact on some corporates

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*“ Our main concern is the inclusion of inter-company trades with our Treasury in the scope of the FTT – this could double the impact of the FTT for us ”*

Global consumer goods company

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- A number of corporates we spoke to are considering relocating their group treasury activities outside the EU-11, or establishing new foreign treasury centres to mitigate the impacts of the tax. This would allow the foreign subsidiaries of European corporates to hedge their risks offshore, thereby avoiding the FTT. Foreign corporates with European treasury centres within the EU-11 are also looking to relocate to avoid the tax

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*“We are exploring moving our treasury to London to mitigate the costs of the FTT”*

European utility

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## LIQUIDITY MANAGEMENT CHALLENGES

- The application of the FTT to repos challenges an important source of secured cash management for corporates. Many of the treasurers we spoke to were heavy users of repos because they provide short-term liquidity and are traded within strong legal and operational frameworks
- The tax on repos makes the short-term repo market (<1 year) unviable, and will require corporates to seek unattractive alternatives. Unsecured bank deposits present material credit (and concentration) risks that are unacceptable to many cash-rich corporates. The EC’s suggestion of a secured funding market does not offer the legal and operational framework required to underpin a functioning secured funding market

Overall, the FTT will raise the cost of financing for corporates, raise the cost of risk management (and encourage risk-taking) and present material challenges for corporates in managing their cash positions. This will challenge corporates’ ability to invest and grow, and to manage balance sheet risks prudently.

## 8.2. GOVERNMENTS

*EU-11 governments will face need to pay higher yields on their government bonds as investors price the future costs of the FTT into asset values. This will feed through to increase the cost of borrowing for European countries at a critical time for stabilising of sovereign finances. The tax on repo markets may lead to a fundamental change in market structure, leading to reduced liquidity and increased systemic risk.*

### INCREASED COST OF CAPITAL

- EU-11 governments will face higher cost of capital as investors demand increased yields to compensate for the future costs of the FTT, capitalised into asset values
- We estimate this will add 20–30bps per annum to EU-11 sovereign debt yields, with significant variation across issuers and instruments. Smaller EU-11 countries and shorter-term debt are likely to face greater yield increases
- Annual financing costs for EU-11 governments will increase by €15–20 BN, equivalent to ~1% total issuance in 2012. This loss is unlikely to be offset by receipts from the FTT

### POTENTIAL FOR SIGNIFICANT CHANGE IN MARKET STRUCTURE

- We see potential for significant change in market structure of government bond markets as the FTT drives causes dramatic market-wide volume reductions (up to 70% declines), and changes the model of intermediation
- The repo market <1 year is expected to close down entirely because these transactions are no longer economically viable (transaction costs will increase by up to 1500x pre-FTT costs. This will remove liquidity from the market, increase dealer funding costs and increase settlement risk as dealers no longer have ready access to inventory
- This could lead to a breakdown in the interdealer market as transaction costs become prohibitive, and market-makers are forced to hold greater inventory to facilitate client orders. However, market risk limits, capital costs and increased funding costs will limit the ability of market-makers to replace the lost market-making capacity
- Overall, the EU-11 government bond market could transition from being a highly liquid and, efficient market with low transaction costs, to a less liquid and expensive market structure; this would add significant liquidity costs to the market, with bid-ask spreads widening 20bps on average to reflect the increased liquidity risk

- Although the European Commission sees the end of bank intermediation as a positive policy outcome, we believe they have not fully properly considered the additional liquidity costs that this would entail. These costs will be felt by sovereign issuers and current investors in these assets

## CHALLENGES TO PRIMARY DEALER MODEL

- The FTT is likely to challenge the primary dealer model for government bonds, and could lead many players to exit this business, challenging governments' ability to syndicate and distribute debt (and further lowering liquidity)
- Primary dealers are required to underwrite government bond issuances as part of a syndicate, – and often to make continuous two-way prices in secondary markets. They need to fund holdings of new issues and market-making positions via the repo market. Without access to the repo market, funding costs may increase substantially
- The primary dealer model is already facing challenged economics given the low rates environment and the costly obligations involved in being a primary dealer. A number of banks have already exited the European primary dealer business<sup>73</sup>, and many more we spoke to expected to review their commitment to underwriting issuance for EU-11 sovereigns if the FTT on repos were introduced

Overall, the FTT will impose material costs on governments, increasing yields on government debt issuance; it is doubtful whether these increased costs will be offset by tax receipts. The FTT also represents a step into the unknown in terms of market structure, and could drive significantly lower market liquidity as the traditional intermediation model breaks down, and primary dealers and market-makers withdraw from the market in response to increased costs.

## 8.3. LONG-TERM INVESTORS

*Long-term investors will face a significant one-off reduction in asset values of current holdings as the market 'prices-in' the future costs of the FTT. They will also face material on-going costs of risk management, as derivatives transactions used to manage interest rate, FX, credit and other risks are subject to the tax. Investors' ability to safely manage and monetise their cash positions will also be challenged, as the FTT on repo and money markets products increases the cost of their liquidity management strategies.*

## MARK-TO-MARKET IMPACT ON CURRENT HOLDINGS

- Current holders of EU-11 issued securities will suffer a one-off mark-to-market reduction in the value of these assets as the market prices-in the future (discounted) cost of the FTT into asset prices
- The impact of asset value reductions will be disproportionately borne by long-term investors. While they only account for only 30% trading activity, they are the primary hold 80% of securities (80% holdings). This means the value of their investments will reduce by €260–340 BN, representing 4–5% of the value of current holdings
- The value of these assets will be eroded by both the explicit direct cost of the tax and indirect liquidity costs arising from lower market-wide volumes. The liquidity costs could represent €50–90 BN (on a capitalised basis), depending on the severity of the volume reduction

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*“The FTT will directly hit asset values and reduce retail investors' returns”*

German asset manager

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<sup>73</sup> For example, Royal Bank of Canada announced the closure of its European government bond trading business on 24<sup>th</sup> July 2013, including primary dealership commitments. Source: <http://www.reuters.com/article/2013/07/24/idUSL6N0FU2YY20130724>

## INCREASED COST OF RISK MANAGEMENT

- Long-term investors' annual cost of hedging their portfolio risks will increase by €5–15 BN, equivalent to 2–9bps of the notional traded. The cost of the FTT here will vary by counterparty and product, and will be significantly higher for “non-linear” products such as options
- Investors are significant users of derivative products to hedge risks as well as modify their portfolio exposures to meet specific asset and liability matching requirements. For instance, asset managers are heavy users of listed futures for duration management to match their asset profile with their (changing) liabilities in response to investor redemptions and subscriptions
- These are low cost instruments (relative to the size of notional), which enable them to mitigate adverse risks, and match returns to investors' risk appetite and pay-out horizon
- We expect a migration of derivatives trading activity to non EU-11 banks, given their lower interdealer costs and therefore tighter bid-ask spreads. A number of investors we spoke to are actively considering migrating their derivatives activity to US or UK banks

## LIQUIDITY MANAGEMENT

- The FTT will also impose additional costs on long-term investors' cash management activities, given the inclusion of repo and money-market products in its scope
- These instruments are used by long-term investors to maintain a buffer of liquid assets in order to meet near-term liability requirements. They manage this liquidity by swapping highly-rated assets for cash in repo markets and by investing in money-market instruments (commercial paper, certificates of deposit). The FTT will render the short-dated end of these markets unviable as transaction costs rise ~1500x. Investors will be forced to hold cash instead, again lowering returns
- Restricted access to repo markets will also limit investors' opportunities for yield enhancement. They can currently generate higher yields on government bonds, corporate bonds and equities by lending assets on a short-term basis. These returns will largely disappear, further depressing overall returns

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*“We would move our derivatives mandates to UK/US banks if margins are lower than EU-11 banks”*

German asset manager

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## LIMITED ABILITY TO MITIGATE TAX EFFECTS; RETAIL INVESTORS TO BEAR THE COSTS

- Unlike other market participants, long-term investors cannot easily change investment behaviour to mitigate effects of the FTT. Most of its costs will simply be borne by institutional investors, such as pension funds, and passed on to retail investors (pensioners, savers) through decreased portfolio returns
- The Commission suggests that long-term investors will shift towards buy-to-hold investment strategies. However, our interviews with investors found that not only is their turnover of securities already of low velocity (for example, 0.2x per annum for corporate bonds), but their asset and liability management obligations to pensioners and investors require regular portfolio rebalancing that cannot be avoided
- Equally, the Commission expects a secular shift towards passive over active investment strategies in response to the FTT. Yet, in many cases, passive funds exhibit higher turnover rates than active funds due to the regular index rebalancing trades required to track an index or meet specific investment criteria. Therefore, the ability of long-term investors to mitigate cost impacts through shifts in investment strategy is limited

In short, the FTT will drive lower returns for long-term investors as they are hit by a one-off impact on asset values, as well as on-going costs of risk management, and reduced yields from liquidity management activities. This will feed directly through to the real economy and impact returns on pensions, savings plans and life insurance for citizens of EU-11 countries.

## APPENDIX A. DATA

Throughout this report we have used publically available data sources wherever possible. Where no data exists we have leveraged academic studies, or proprietary data from Oliver Wyman or AFME. Any estimates not directly taken from a public data source represent the expert opinion of Oliver Wyman and have been noted as such. Key data sources used in this report are shown below.

### A.1. EQUITIES

EXHIBIT 40: EU-11 EQUITIES MARKETS BY COUNTRY (2012, €BN)

Country	Market capitalisation	Value traded	Turnover velocity	Average annual issuance (2004–2012)
Austria	73	64	0.9x	3.9
Belgium	381	269	0.7x	4.9
Estonia	1	0	0.1x	0.1
France	1,151	2,552	2.2x	22.7
Germany	1,035	3,164	3.1x	20.7
Greece	27	13	0.5x	3.6
Italy	365	1,050	2.9x	10.5
Portugal	46	56	1.2x	1.7
Slovakia	4	0	0x	0.0
Slovenia	5	0	0.1x	0.1
Spain	739	1,271	1.7x	9.5
<b>Total</b>	<b>3,826</b>	<b>8,440</b>	<b>2.2x</b>	<b>77.8</b>
EU-11 average	348	767	2.2x	7.1

Sources: BATS Global Markets, Thomson Reuters<sup>74</sup>, World Federation of Exchanges, Federation of European Securities Exchanges, exchange websites, Oliver Wyman analysis

EXHIBIT 41: EU-11 EQUITIES MARKET TURNOVER BY VENUE AND COUNTRY (2012, €BN)

Country	Main market	Multilateral trading facility	Over-the-counter	Total	OTC as % total
Austria	17	6	41	64	64%
Belgium	76	40	154	269	57%
Estonia	0.1	0	0	0.1	0%
France	845	468	1,239	2,552	49%
Germany	959	469	1,737	3,164	55%
Greece	13	0	0	13	0%
Italy	514	106	430	1,050	41%
Portugal	20	6	30	56	54%
Slovakia	0.1	0	0	0.1	0%
Slovenia	0.3	0	0	0.3	0%
Spain	821	0	450	1,271	35%
<b>Total</b>	<b>3,265</b>	<b>1,095</b>	<b>4,080</b>	<b>8,440</b>	<b>48%</b>
EU-11 average	297	100	371	767	

Sources: BATS Global Markets, Thomson Reuters<sup>75</sup>, World Federation of Exchanges, Federation of European Securities Exchanges, exchange websites, Oliver Wyman analysis

<sup>74</sup> Thomson Reuters Equity Monthly Market: <http://thomsonreuters.com/monthly-market-share-reports/>

<sup>75</sup> Thomson Reuters Equity Monthly Market: <http://thomsonreuters.com/monthly-market-share-reports/>



## A.2. CORPORATE BONDS

EXHIBIT 42: EU-11 CORPORATE BONDS BY COUNTRY (2012, €BN)

	Outstanding	Turnover	Turnover velocity	LT debt issuance
Austria	16	14	0.9x	5
Belgium	55	20	0.4x	12
Estonia	1	<1	0.6x	<1
France	316	207	0.7x	63
Germany	143	90	0.6x	67
Greece	11	6	0.6x	<1
Italy	115	52	0.5x	29
Portugal	15	9	0.6x	5
Slovakia	<1	<1	0.6x	<1
Slovenia	1	<1	0.6x	<1
Spain	94	59	0.6x	17
<b>Total</b>	<b>766</b>	<b>457</b>	<b>0.6x</b>	<b>197</b>
EU-11 average	70	42	0.6x	18

Sources: Xtrakter, Dealogic, Oliver Wyman analysis

EXHIBIT 43: CORPORATE BOND BID-ASK SPREADS JUNE 2013 VS. FEBRUARY 2009  
AVERAGE END-OF-DAY BID-ASK SPREADS (BPS)

Country	3-Jun-13	4-Feb-09	Delta	Sample size
Investment Grade	39	192	153	548-817
High Yield (non-distressed)	87	131	44	282-331
High Yield (distressed)	272	597	325	18-106

Note: HY spread data for February 2009 appears anomalous (lower than IG). This is explained by the fact that Markit data represents end-of-day indicative (non-executed) pricing. It is likely that HY bonds were thinly traded during this period, and therefore accurate spread data (comparable to IG) was not available for this period. These datapoints are used for illustration only.

Source: IBoxx/Markit, Unicredit, Oliver Wyman analysis

## A.3. GOVERNMENT BONDS

EXHIBIT 44: EU-11 GOVERNMENT BOND MARKETS BY COUNTRY (2012, €BN)

	Outstanding	Value traded	Turnover velocity	LT debt issuance
Austria	193	193	1x	21
Belgium	336	1,089	3.2x	45
Estonia	0	0	1x	0
France	1,366	3,382	2.5x	202
Germany	1,269	6,346	5x	255
Greece	107	107	1x	7
Italy	1,625	4,200	2.6x	233
Portugal	124	124	1x	9
Slovakia	33	33	1x	9
Slovenia	17	17	1x	2
Spain	671	2,411	3.6x	120
<b>Total</b>	<b>5,741</b>	<b>17,901</b>	<b>3.1x</b>	<b>902</b>
EU-11 average	522	1627	3.1x	82

Source: ECB, EU-11 government debt management offices, Oliver Wyman analysis

EXHIBIT 45: GOVERNMENT BOND BID-ASK SPREADS JUNE 2013 VS. FEBRUARY 2009  
AVERAGE END-OF-DAY BID-ASK SPREADS (BPS)

3 JUNE 2013

	Median	5th percentile	95th percentile	Sample size
Austria	13	8	60	19
Belgium	17	8	33	23
France	9	3	34	42
Germany	4	2	27	52
Greece	230	201	254	20
Italy	16	7	66	58
Portugal	19	14	28	9
Spain	31	12	92	31

27 FEBRUARY 2009

	Median	5th percentile	95th percentile	Sample size
Austria	46	28	84	14
Belgium	25	12	52	20
France	24	11	62	39
Germany	10	7	57	41
Greece	39	22	95	22
Italy	21	7	96	45
Portugal	29	16	59	13
Spain	27	12	67	22

Note: Markit data is indicative end of day pricing data and does not reflect executed prices/spreads. We note that the spread data is likely to be less reliable on less liquid instruments as a result. However the data provides a useful reference point to show relative liquidity between instruments and in periods of normal and stressed liquidity. The data shown above is not volume weighted; we note that the volume-weighted average will trade closer to the 5th percentile than the median given these instruments will trade more frequently.

Source: iBoxx/Markit, Bloomberg, Unicredit, Oliver Wyman analysis

## A.4. DERIVATIVES

EXHIBIT 46: FX FORWARDS LIQUIDITY PREMIUM BY INSTRUMENT AND TENOR  
INCREASE IN BID-ASK SPREAD BY VOLUME DECLINE SCENARIO (BPS)

Currency pair	-30% decline in turnover			-50% decline in turnover		
	<1W	1W-1Y	>1Y	<1W	1W-1Y	>1Y
EUR-USD	0.4	0.4	1.4	0.9	0.9	2.8
EUR-GBP	0.9	0.8	2.7	1.8	1.7	5.5
EUR-JPY	0.9	0.8	2.9	1.8	1.6	6.1
EUR-CHF	1.2	1.1	4.2	2.4	2.2	8.6
EUR-SEK	1.5	1.3	4.6	3.2	2.6	9.5
EUR-CAD	1.3	1.5	4.2	2.8	3.1	8.6
EUR-AUD	1.7	1.5	4.4	3.5	3.1	9.1
Weighted average		0.7			1.3	

Source: BIS, Datastream, Oliver Wyman analysis

**EXHIBIT 47: INTEREST RATE SWAPS LIQUIDITY PREMIUM BY INSTRUMENT AND TENOR**  
**INCREASE IN BID-ASK SPREAD BY VOLUME DECLINE SCENARIO (BPS)**

Currency	Daily turnover (€BN)	Current bid-ask spreads (bps)	Increase in bid-ask spread per scenario (bps)	
			40% decline	60% decline
EUR	424.7	2.5	0.15	0.28
USD	228.4	2.7	0.16	0.30
GBP	107.0	2.8	0.18	0.32
JPY	86.0	1.6	0.18	0.33
CAD	28.9	2.9	0.21	0.38
AUD	20.8	5.6	0.21	0.39
NOK	6.3	5.0	0.25	0.45
CHF	6.3	6.1	0.25	0.45
SEK	5.2	3.2	0.25	0.46
MXN	3.4	4.4	0.27	0.49
NZD	2.3	4.1	0.28	0.51
HKD	2.2	8.9	0.28	0.51
SGD	2.2	4.0	0.28	0.51
THB	1.0	3.0	0.31	0.56
DKK	0.6	4.2	0.32	0.60

Source: BIS, Datastream, Oliver Wyman analysis

## APPENDIX B. SECURITIES CAPITALISATION METHODOLOGY

As outlined in section 3, we expect the net impact of the FTT (direct taxes, volume decline and liquidity premium) to be capitalised into asset values, as investors price in the effects of the FTT. Our methodology is based on 2004 study<sup>76</sup> by the Institute for Fiscal Studies (IFS) into the effect of stamp duty on share prices, adapted to the specifics of the EC FTT proposal.

### B.1. EQUITIES METHODOLOGY

For equities, we use the following discounted cash-flow formula to calculate the impact of the FTT on the present value of equities:

$$P_{current} = \frac{D}{r - g}$$

$$P_{post\ FTT} = P_{current} \left( \frac{-fT_{post} - f_{MM}T_{post} - L_pT_{post}}{(r - g) + fT_{post} + f_{mm}T_{post} + L_pT_{post}} \right) + P_{current}$$

Where:

$P$  = share price

$D$  = Dividend per share

$f$  = Effective rate of tax

$f_{MM}$  = Increased market maker spread

$T$  = Annual turnover (value traded post FTT)

$r$  = Expected rate of return (cost of equity)

$g$  = Growth rate of future cash flows

$L_p$  = Liquidity premium (x%)

<sup>76</sup> Bond, Hawkins & Klemm (2004), "Stamp Duty on Shares and its Effect on Share Prices", Institute of Fiscal Studies

## B.2. FIXED INCOME METHODOLOGY

For bonds, we modify this methodology to account for the maturity of the bond, and impacts on price and yield given the FTT, using:

$$P_{current} = C \frac{1}{r} \left[ 1 - \frac{1}{(1+r)^t} \right] + F \left[ \frac{1}{(1+r)^t} \right]$$

$$P_{post} = (C - fT_{post}P_{post} - f_{MM}T_{post}P_{post} - L_pT_{post}P_{post}) \frac{1}{r} \left[ 1 - \frac{1}{(1+r)^t} \right] + F \left[ \frac{1}{(1+r)^t} \right]$$

Where:

$P$  = Bond price

$C$  = Coupon

$F$  = Face value of bond

$f$  = Effective rate of tax

$f_{MM}$  = Increased market maker spread





$T$  = Annual turnover velocity

$r$  = Expected rate of return (cost of debt)

$L_p$  = Liquidity premium (x%)

$t$  = Maturity of bond in years

## APPENDIX C. OVERVIEW OF OTHER FTT REGIMES

Country	Timing	Tax	Volume impact
 UK	1986–present	<ul style="list-style-type: none"> <li>50bps tax on purchase price levied on buyer of UK-registered equities</li> <li>Intermediaries exempt</li> <li>Does not apply to UK-listed foreign stocks</li> </ul>	<ul style="list-style-type: none"> <li>UK turnover velocity systematically lower than other European peers (~0.6x vs. DB/Euronext at 0.8–1.2x)</li> <li>High incidence of product substitution (e.g. derivatives, CFDs, ETFs) given no tax levied on these products</li> </ul>
 France	Aug. 2012–present	<ul style="list-style-type: none"> <li>20bps stamp duty on French equities (with market cap &gt;€1 BN)</li> <li>Levied on buy-side only; primary markets and market-making exempt</li> <li>1bps tax on HFT on cancelled/amended orders</li> <li>1bps on notional on EU sovereign CDS levied on French buyers</li> </ul>	<ul style="list-style-type: none"> <li>-26% month-on-month decline in French cash equity volumes in August 2012 (vs. European market average -18%)</li> <li>Euronext turnover velocity down ~20 percentage points on 2012 average (~50% vs. ~80% 2012 average)</li> <li>French turnover down 5.2% as proportion of pan-European turnover (over 3 months)</li> </ul>
 Italy	March 2012–present	<ul style="list-style-type: none"> <li>12bp stamp duty on Italian equities (and equity-like instruments)</li> <li>22bps for OTC trading (vs. 12bps for on-platform)</li> <li>Exemption for market-making; netting permitted</li> <li>Additional tax on derivatives introduced on 1<sup>st</sup> September 2013</li> </ul>	<ul style="list-style-type: none"> <li>12% fall in average daily value of trading of Italian shares during March (vs. European avg. +9%)</li> <li>Italian turnover down -12.4% as proportion of pan-European turnover (over 3 months)</li> <li>Sharp fall in use of broker crossing networks to avoid OTC tax; 23% rise in MTFs/dark pool volumes</li> </ul>
 Sweden	1984–1991	<ul style="list-style-type: none"> <li>50bps on purchase/sale of cash equities and equity options</li> <li>Tax increased to 100bps in 1987 (50% waiver for interdealer)</li> <li>Additional tax on bonds introduced in 1987 (0.2bps – 3bps)</li> <li>Levied on all trades through registered Swedish brokers</li> <li>FTT removed in 1991</li> </ul>	<ul style="list-style-type: none"> <li>Migration of trading to non-Swedish dealers and widespread relocation of volumes to London</li> <li>~30% volume shift by 1987; &gt;50% volume shift by 1990</li> <li>Bond trading volumes fell 85% in first week of trading; futures volumes down ~100%</li> <li>Decline in trading volumes led to loss in capital gains tax, offsetting FTT tax revenues</li> <li>Volumes recovered during the 1990s, following the removal of the FTT</li> </ul>

Sources: Bank of America Merrill Lynch, Morgan Stanley, BATS Global Markets

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