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# AFME: Bank Structural Reform study

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# Contents

# *Scope, approach and key conclusions*

# *Scope of the study*

## Impact of structural reform

**Assess the impact on firms, markets, users of banking services and the economy resulting from separation of trading activities**

- Examine key financial and non-financial impacts
- Draw upon public data and previous studies
- Segmental analysis based on third party data and scaled impacts where appropriate
- Validate our assumptions and overall impact numbers with selected member banks
- Cover broader implications for the development of capital markets

## Implicit subsidy

**Quantify the existence, if any, of an implicit subsidy for EU banks**

- Review/critique of existing studies
- Using up to date financial market information, estimate the level, if any, of such a subsidy across EU banks
- Rank the influence of the implicit government guarantee against a range of other factors (e.g. size, credit risk, retail vs trading activities etc.) to examine their relative importance

## Inventory of responses

**Build an inventory of bank responses, demonstrating the scope of change already undertaken**

- Using available public data, build an inventory of:
  - Market exits or downscaling
  - Reduced trading volumes
  - Cost cutting and job losses.
  - Improvements to resolvability
- Identify, where possible, activities which have shifted outside the regulated banking system

# *Achievements of reform and changes to date*

# *There has been substantial progress on developing and implementing reform of the EU banking sector*

- Higher capital and liquidity requirements, changes to market infrastructure and central clearing of derivatives and resolution planning have contributed to a more robust financial system.
- A more robust financial system should reduce the probability and impact of future crises, but there is also an economic cost to these reforms though a higher cost of financing, reduced availability of credit and shrinkage of the financial sector.

**Economic cost of key regulatory reforms**

| Reform area | Source of economic impact assessment | GDP impact |
|---|---|---|
| Capital, liquidity and leverage | *Source: BIS (2010) "An assessment of the long-term economic impact of stronger capital and liquidity requirements"* | Up to 0.59% of GDP (+6% CT1/RWA, incl NSFR) |
| Deposit guarantees and resolution funds | *Source: EC (2010) "Impact assessment of the deposit guarantee scheme"* | 0.25% of GDP |
| RRP/Living wills | *Source: EC (2012) "Impact assessment of the RRD"* | 0.09% of GDP |
| Financial stability contribution | *Source: IMF (2010) "A fair and substantial contribution by the financial sector: Final report for the G-20"* | 0.3% of GDP |
| Market infrastructure | *Source: BIS (2013) "Macroeconomic impact assessment of OTC derivatives regulatory reforms"* | 0.04% of GDP |
| **Total** | | **1.27% of GDP** |

# *Banks have recapitalised, reshaped and refocused*

## Recapitalised

- Reported tier 1 capital across the 24 banks studied has increased by 80% from 2006 to 2013, a total increase of €610bn.
- Banks have also deleveraged balance sheets – across the 24 banks studied total assets have decreased 12.3% from 2008 to 2013, a fall of over €3.5tn.
- As a result of these initiatives banks are making strong progress in relation to Basel III ratio requirements:
  - The average fully-loaded CET1 ratio across the sample banks in our study stood at 10.9% at the end of Q2 2014;
  - The average leverage ratio at the end of Q2 2014 was at 4.4%, comfortably above the Commission's figure of 3% which it is currently consulting on.
- Although the liquidity coverage ratio (LCR) is not due to be enforced until 2015, eight out of the ten banks who have disclosed pro-forma LCR figures were in excess of the regulatory minimum of 100% .

## Reshaped

- Due to increased capital requirements, regulatory pressures and commercial performance, banks have announced significant moves away from certain business lines:
  - Almost 90% of banks studied have announced reductions in proprietary trading activities since the financial crisis, with over half exiting these businesses;
  - In commodities businesses, 58% of banks studied have scaled down operations since 2009;
  - There have also been multiple departures from business where banks provide important market-making roles (e.g. equities and fixed income).
- The Recovery & Resolution process and group resolvability assessments are beginning to drive structural changes which improve resolvability and lower systemic risk.

## Refocused

- To make best use of available capital, banks are focusing on strategic changes driving towards serving key customers.
- Most banks have announced exits from countries and regions of low market share in order to concentrate on areas of key strength and utility.
- Banks have created non-core divisions to exit off-strategy areas, and provide greater direction and focus to remaining activities:
  - Over half of the banks studied have created non-core divisions;
  - A study of a sub-set of non-core divisions suggests that total non-core assets have fallen by almost three-quarters since their inception.
- Banks have undergone significant cost reduction programmes. Across a subset of 10 large representative banks, we have identified major cost savings programmes totalling €25.7bn since 2009.

*Source: Bank annual reports and Capital IQ.*

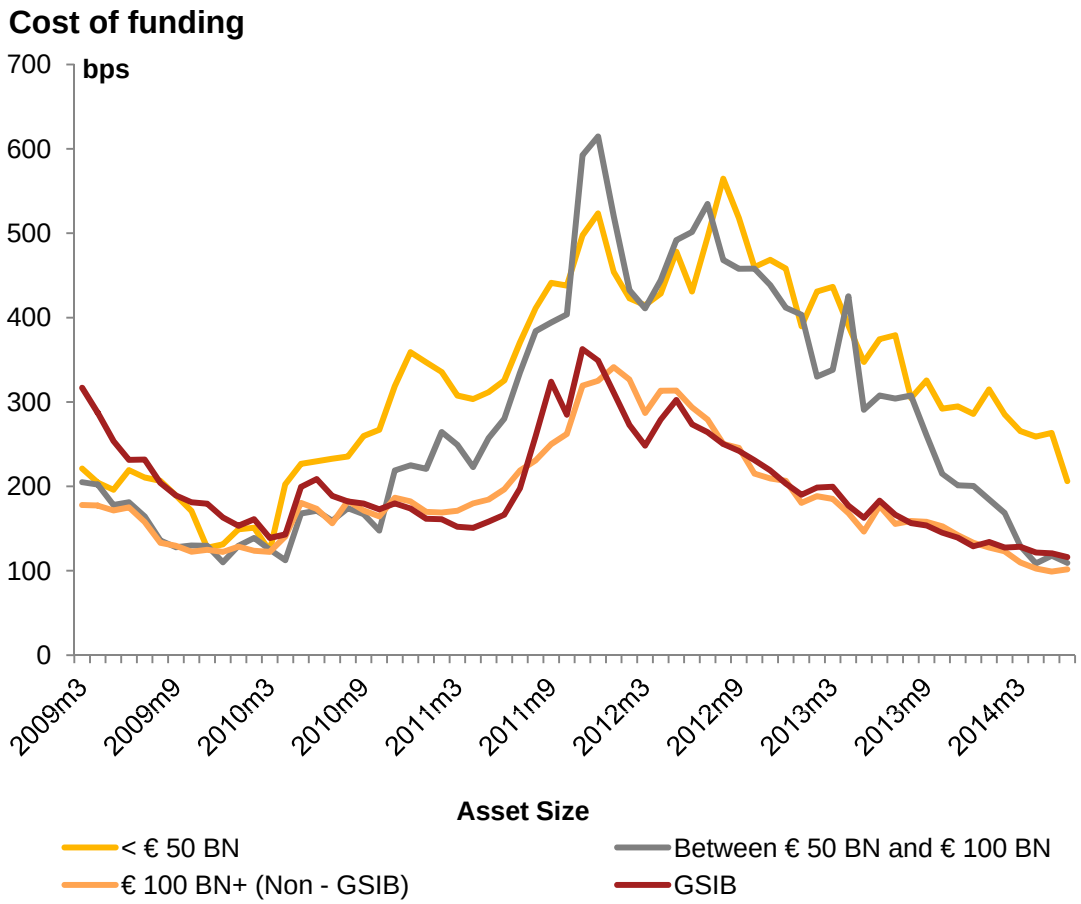
*The sample of 24 banks comprises of 16 European banks (Barclays; BNP Paribas; Commerzbank; Credit Agricole; Credit Suisse; Deutsche Bank; HSBC; ING; Intesa Sanpaolo; Groupe BPCE; RBS; Santander; Société Générale; Standard Chartered; UBS; Unicredit) and 8 US banks (Bank of America; BoNY Mellon; Citigroup; Goldman Sachs; JP Morgan Chase; Morgan Stanley; Wells Fargo; Northern Trust).*

# *Evidence on the implicit subsidy for EU banks*

# *A number of recent studies have suggested that the implicit subsidy of the banking sector has diminished substantially since 2008.*

| Author | Overview | Estimate | Comments | Conclusion |
|---|---|---|---|---|
| **OECD (2012)** | Study credit rating differentials over the period 2007-2012 for European countries. | $0bn to $43bn | Find that the incidence of implicit guarantees increased since the beginning of the financial crisis, but have decreased more recently. They attribute this reduction to a combination of declining sovereign strength and ongoing efforts in many OECD countries to make bank failure resolution regimes and practices more effective. | Positive but declining |
| **European Commission (2014)** | Study credit rating differentials for the period 2011-2013 in the EU. | €59bn to €95bn | Estimates that the implicit subsidy fell from EUR 72-95bn in 2011 to EUR 59-82bn in 2012. Furthermore, this paper notes that there was an expectation from rating agency Fitch that BRRD is likely to weaken further sovereign support. | Significant effect |
| **Oliver Wyman (2014)** | Review interest rate differentials between insured and uninsured deposits over the period 2006-2012 in the US. | 4bps | Update a study by Jacewitz and Pogach to cover a more recent period (2006-2012) and find that large banks only pay approximately 4bps lower in risk premiums compared to smaller banks (across the size thresholds for MMDAs accounts) compared to an earlier estimate of 40bps for the period 2005-2010 estimated by Jacewitz and Pogach. | Minimal effect |
| **GAO (2014)** | Controlling for a variety of drivers of funding cost, GAO attempt to see if large Bank Holding Companies in the US have a funding advantage over small BHCs over the period 2006-2013. | (63)bps to 196bps in 2013 | GAO's results suggest that large banks had lower funding costs in the period 2007-2009 , however, most recent analysis of funding costs suggests that the advantage might has reversed and large banks might actually face higher funding costs. For example, in 2008 results suggest a range of 17 to 630 bps lower funding costs for TBTF banks, while for 2013 the range is 196 bps lower to 63 bps higher costs. | Inconclusive |
| **Oliver Wyman (2014b)** | Controlling for a variety of drivers of funding cost, OW attempt to see if a bank having G-SIB status leads to a funding advantage over the period 2009-2013. | 137bps to 0bps | The study estimates a large and statistically significant bond spread advantage for G-SIBs of 137 bps in 2009 which declines each year thereafter, to 57 bps by 2011. Extending the analysis to 2013, the funding advantage continues to decline and becomes statistically insignificant. | Minimal effect by 2013 |
| **IMF (2014)** | Using a variety of approaches to assess if policy efforts to alleviate TBTF have changed funding cost advantages. | 15bps to 60bps | Estimates derived from credit ratings have shown a steady decline in implicit subsidies since 2009 across advanced economies, but are still at levels compared to pre-crisis. Estimate based on CDS analysis show that implicit subsidy levels in the Euro Area have been falling in 2013 and 2014. | Positive but declining |

# *Analysis of current market evidence on debt spreads does not suggest that EU G-SIBs banks benefit from lower funding costs compared to EU non-G-SIB banks.*

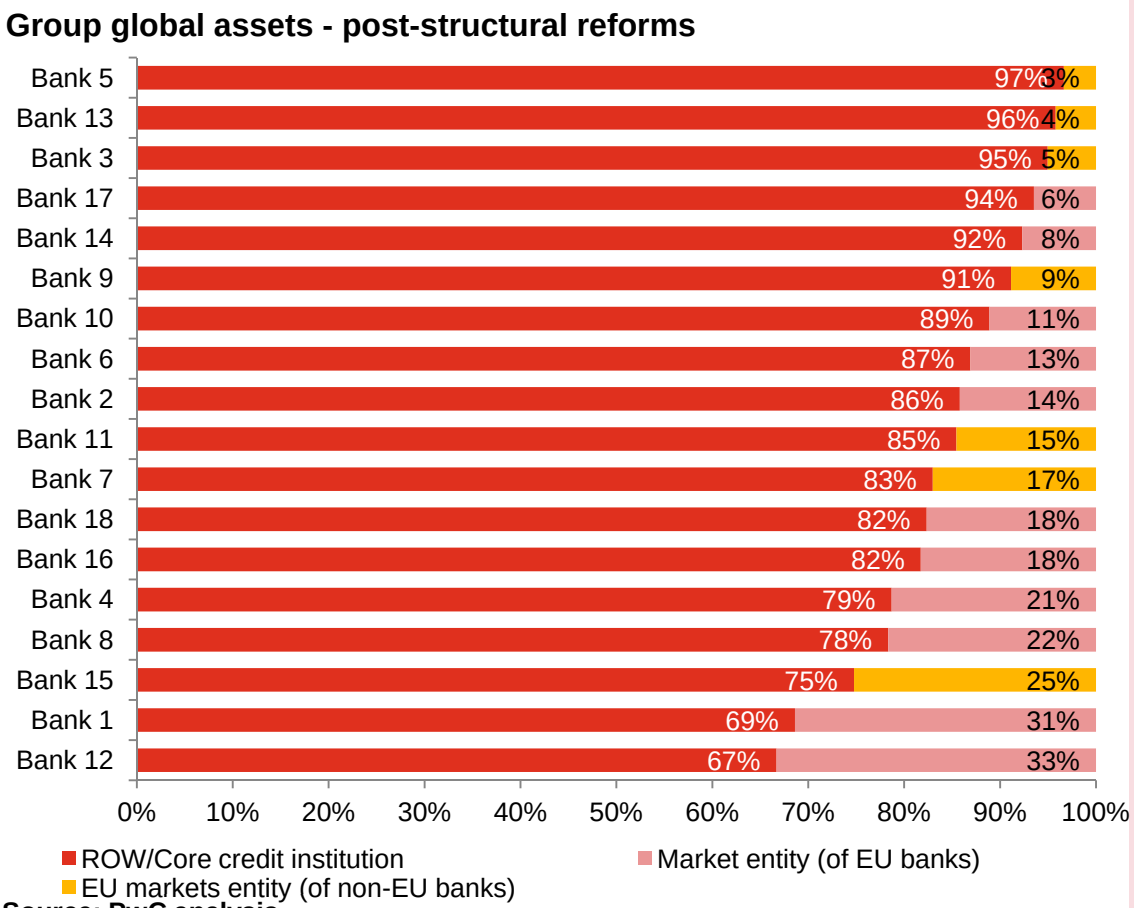



- EU G-SIB banks faced higher funding costs compared to other large and small banks in the EU between 2009 and the back-end of 2010.
- Between late 2010 and end 2011, funding cost across all banks were quite volatile and increased progressively largely as a consequence of European sovereign debt crisis and increased market volatility. During this period, large banks (both G-SIB and non G-SIB) obtained lower funding costs compared to medium and small banks in the EU.
- Since then, yields have declined across all banks, although large banks continue to obtain lower funding costs.
- However, more recently, current funding costs are broadly similar across a range of medium, large non G-SIB and G-SIB banks. Nonetheless, yield estimates for these banks are markedly below relatively small sized banks. Our econometric approach can be used to detect whether this is due to lack of implicit support or other factors such as credit risk.

Source: PwC analysis and Capital IQ
AFME: Structural reform study

# *The impact on EU banks*

# *Bank separation will lead to substantially smaller economically separate EU markets entities*

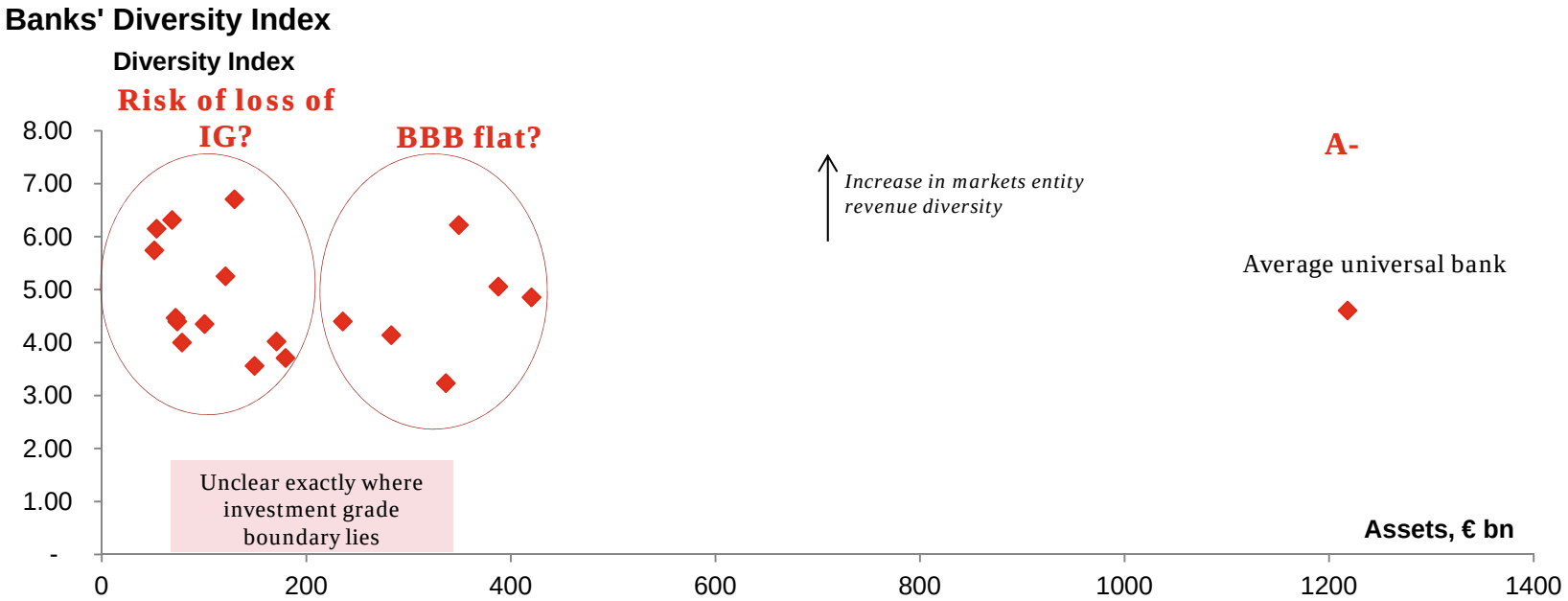



**Source: PwC analysis**

- The chart shows the relative size of the would be separated markets entities for the banks in our analysis. Bank assets have been allocated into the core credit institution and markets entities based on the assumption that only investment banking, FICC and cash equities, derivatives and prime services activities will be placed within the trading or markets entity.
- We have not accounted for differences in scope for branches and subsidiaries of EU banks that could be exempt from these rules. We note that foreign subsidiaries of EU banks may be exempted if they are subject to equivalent separation rules or subsidiaries of banking groups that have an autonomous geographic decentralised structure pursuing a multiple point of entry resolution strategy.
- We have included UK banks in our analysis on the assumption that UK banks will be required to separate retail and trading activities. We have not quantified differences between the UK's retail ring-fencing regime and the EC's structural reform proposals.

Source: Tricumen, PwC analysis
AFME: Structural reform study

# *Due to their smaller size and reduction in revenue and funding diversification as separate entities, funding costs will be higher, particularly for the markets entities.*

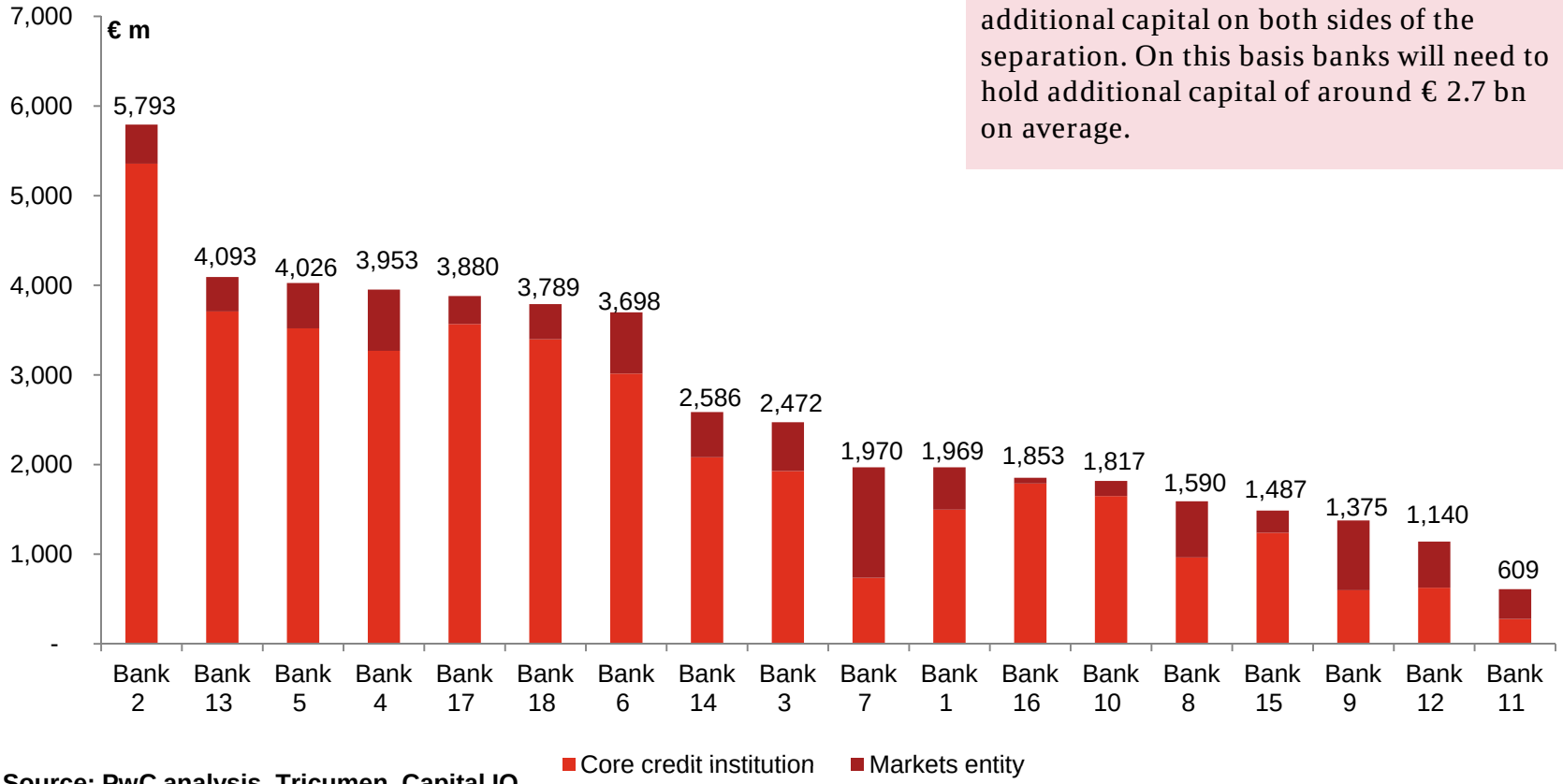



- The diversity index is the sum of the squared revenue shares across segments in the markets entity (i.e. investment banking, FICC and cash equities).
- The existing integrated group businesses of universal banks can achieve A- credit ratings due to their size and diversification across investment banking activities (and historically strong capital position).
- EU Bank markets entities will be a significantly smaller, and less diversified compared to existing banks.
- Rating agencies have suggested that small EU markets entities would struggle to maintain an investment grade rating.
- We assume separated markets entities of €200-550m assets could be downgraded to BBB but still keep investment grade ratings.
- Smaller markets entities could be at risk of losing their investment grade rating, e.g. downgrade to BB.

Source: Tricumen, PwC analysis
AFME: Structural reform study
PwC

# *Banks in our sample will need to hold additional capital of around €48 bn in total*

**Additional capital required within EU**

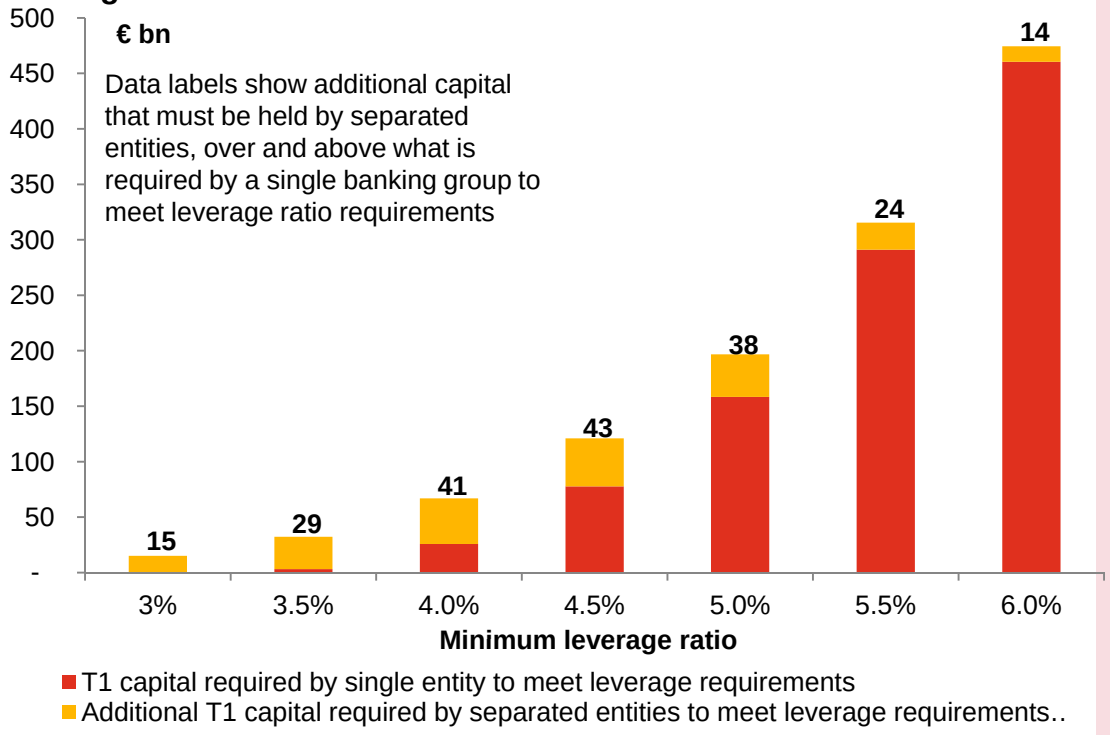



We assume banks will require 1% of additional capital on both sides of the separation. On this basis banks will need to hold additional capital of around € 2.7 bn on average.

**Source: PwC analysis, Tricumen, Capital IQ**

# *The leverage ratio is expected to be a significant constraint to separated entities.*

**Impact of structural reform on banking groups due to leverage ratio**




Leverage ratios defined as Tier 1 capital divided by total leverage exposure.
Note: CRD IV/Basel III fully-loaded leverage ratios shown where available. FRB supplementary leverage ratios shown for US banks.

Source: Tricumen, PwC analysis
AFME: Structural reform study
PwC

The lower bar on the chart shows the additional Tier 1 capital that is required to be held by a single banking entity in order to meet different levels of leverage ratio requirements. The upper bar shows the additional capital required by separated entities.

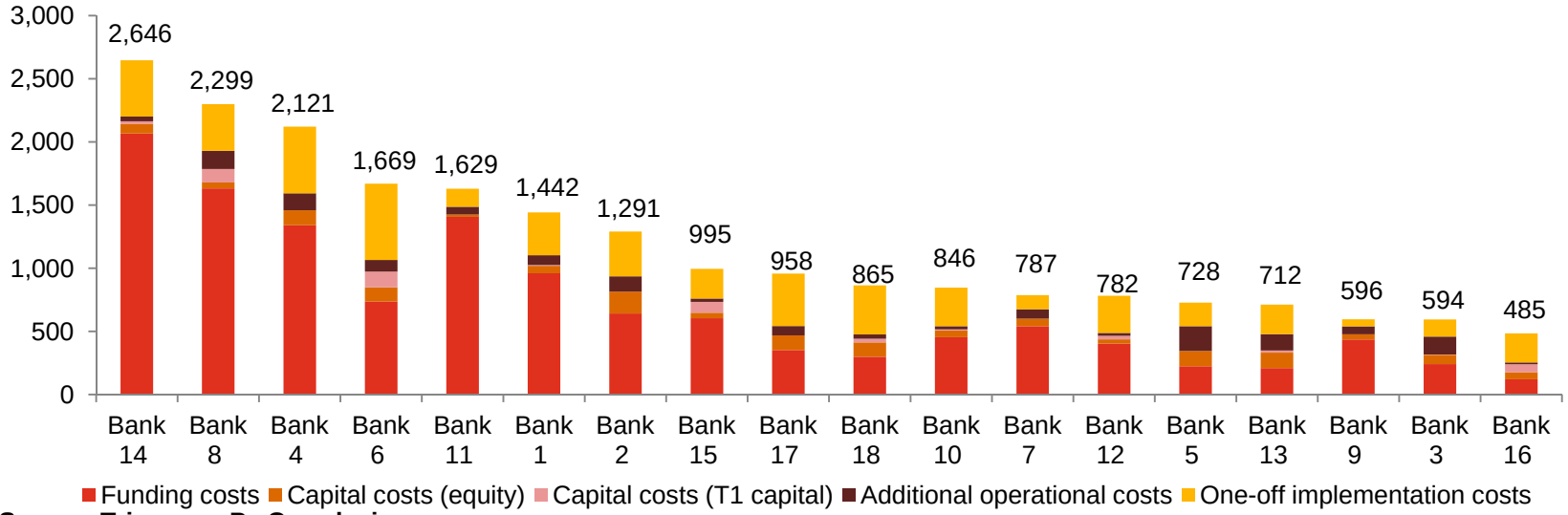
If the leverage ratio requirement is at 4%, as single entities, the sector will have to hold €26 bn of additional capital. However, as separated entities, the sector will have to hold additional capital of €67 bn to meet the leverage requirement separately.

Therefore separated entities will have to hold **€41 bn** more Tier 1 capital than for a single entity.

This assumes capital is allocated to separate entities in proportion to RWAs.

# *The total costs of structural reform to banks are significant*

**Impact of structural reforms for EU core credit institution and markets entities (€m)**




**Source: Tricumen, PwC analysis**

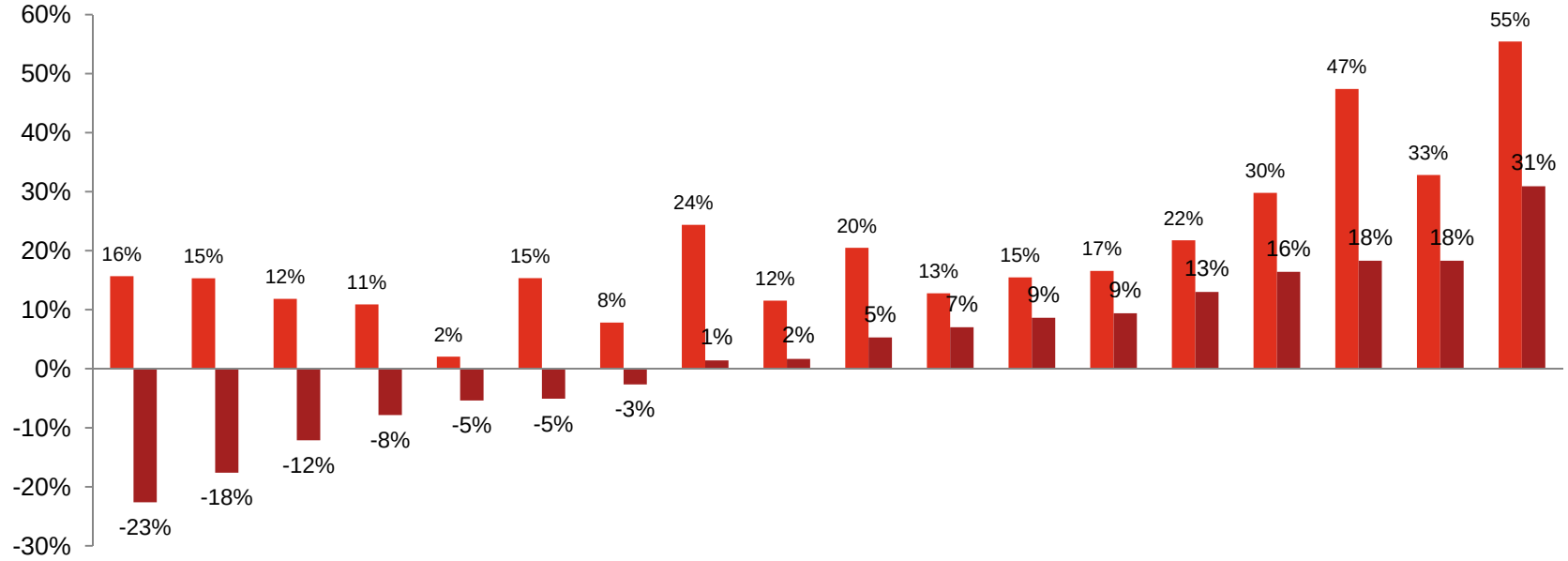
- We estimate total annual cost impact of structural reforms on banks' EU operations of €21bn per annum, with additional implementation costs of €9bn.
- It is comparable to other impact studies: HM Treasury estimates the annual cost impact of UK ring-fencing to be between £0.36 bn to £0.78bn per bank.
- This is the pre-mitigation cost, before taking into account banks' potential response to structural reforms, e.g. re-pricing and withdrawal from certain segments.

| Total costs of structural reform to banks | Total – Sample 18 banks (€ bn) | Total – Impacted EU banks (€ bn) |
|---|---|---|
| Funding costs | 12.7 | 16.8 |
| Equity capital costs | 1.4 | 1.8 |
| Capital costs (leverage ratio) | 0.5 | 0.6 |
| Additional operational costs | 1.5 | 1.9 |
| **Total** | **16.1** | **21.1** |
| One-off implementation costs | 5.4 (or 1.1 p.a. over 5 years) | 9.3 (or 1.8 p.a. over 5 years) |

Source: Tricumen, PwC analysis

# *Separation will reduce the number of viable EU capital markets banks*

**Pre-tax returns – EU separated markets entity**



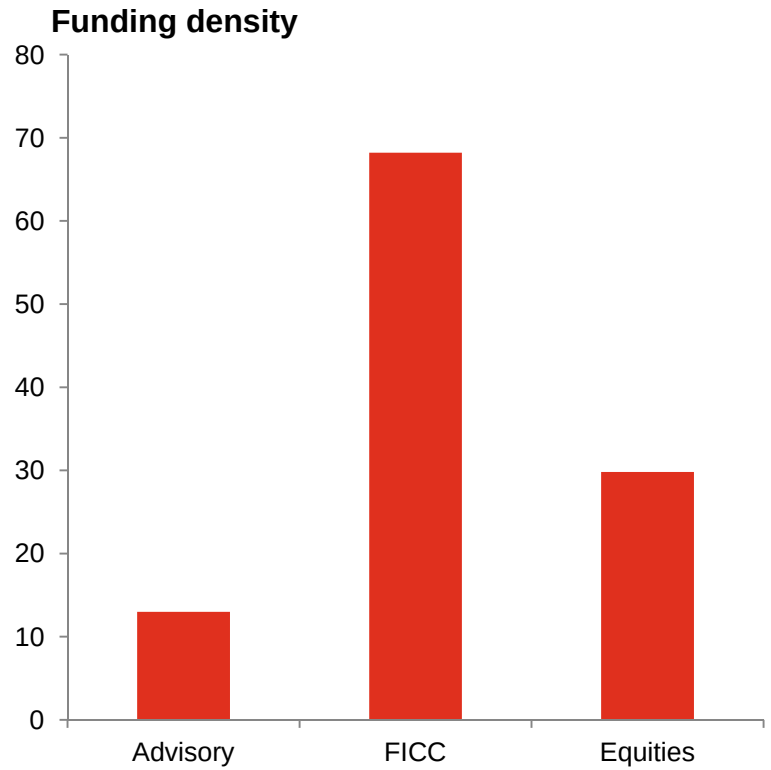

*Source: Tricumen data, PwC analysis* ■ Pre-structural separation ■ Post-structural separation

Note: Pre-tax returns are calculated as operating margins less allocated costs, excluding one-off items, divided by imputed equity.

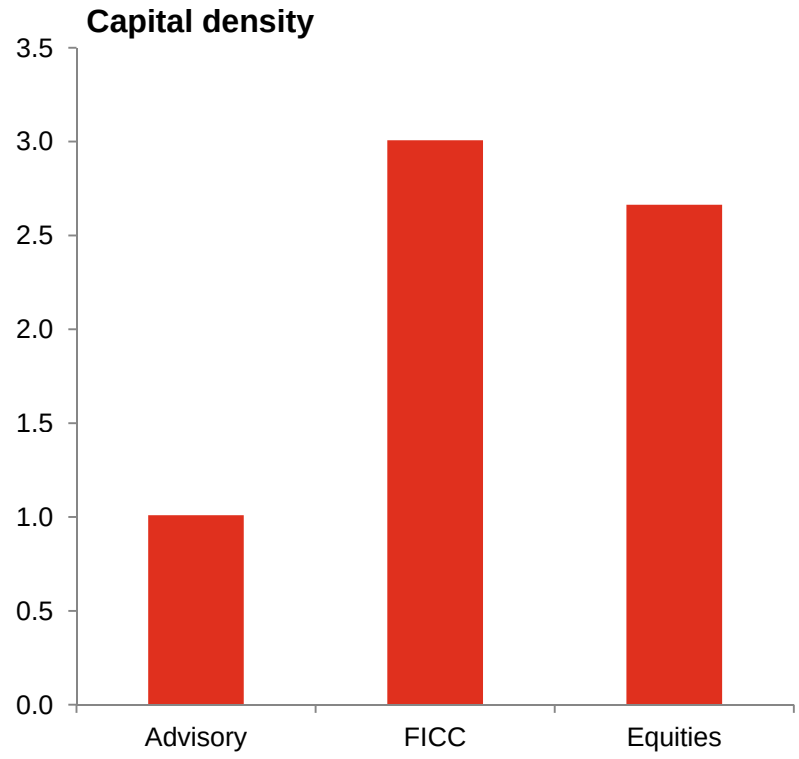
| | Average pre-tax returns, EU markets entity | Average pre-tax returns, Group |
|---|---|---|
| Pre-structural separation | 16.8% | 9.8% |
| Post-structural separation | 2.0% | 7.7% |

# *The FICC business likely to be most heavily impacted as they are more funding and capital intensive*

**Funding density (expressed as ratio of liabilities excluding equity to revenues), EU 2013**



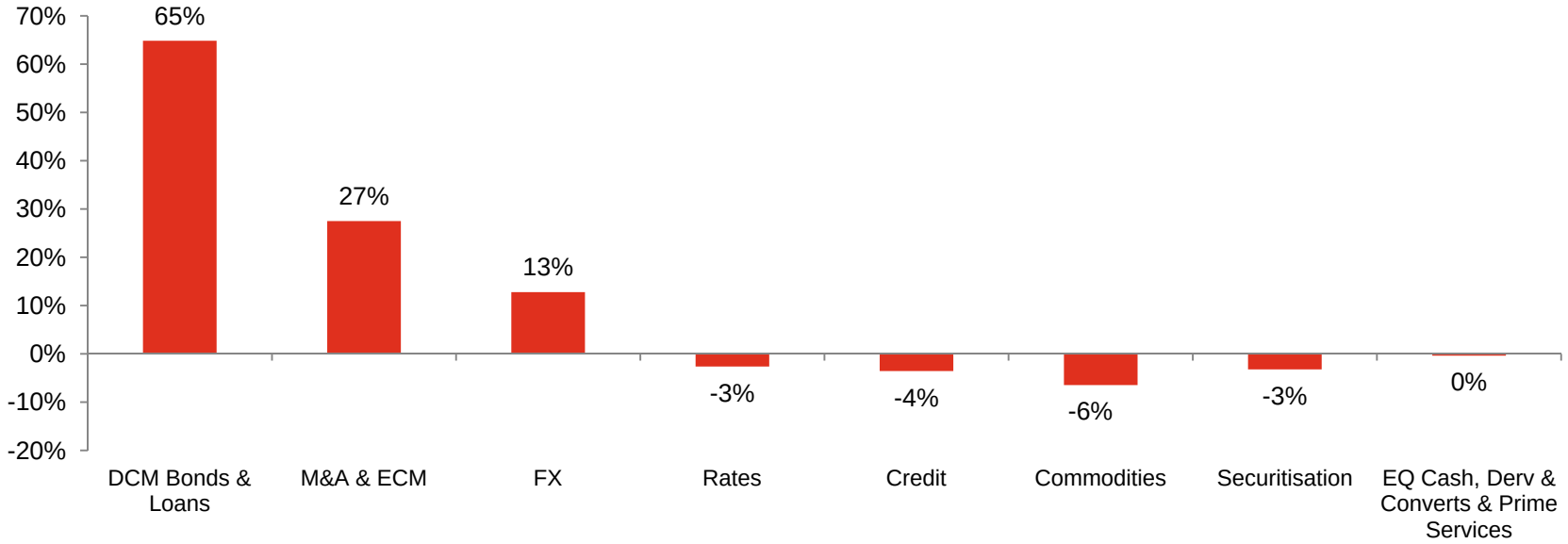

**Capital density (expressed as ratio of CET1 capital to revenues), EU 2013**




*Source: Tricumen, S&P Capital IQ, PwC analysis*

# *Bank exits in FICC segments would be likely to further reduce secondary capital market liquidity*

**Pre-tax, post-reform returns for investment banking and trading businesses at EU level, 2013**




- The table shows the pre-tax returns across trading and investment banking activities following structural separation.
- The biggest impacts are to rates, credit, commodities and securitisation. This is because these businesses require banks to hold inventory to enable market making activities in other the counter markets. Following structural reform we to expect market exits to continue leaving a much more concentrated market containing US and a few large European banks.
- Business segments with smaller amounts of equity capital employed (e.g. advisory services) display significantly larger pre-tax returns.

Source: Tricumen, PwC analysis
AFME: Structural reform study

# *The impact on EU capital markets*

# *The impact of structural reform is likely to be concentrated in fixed income capital markets*

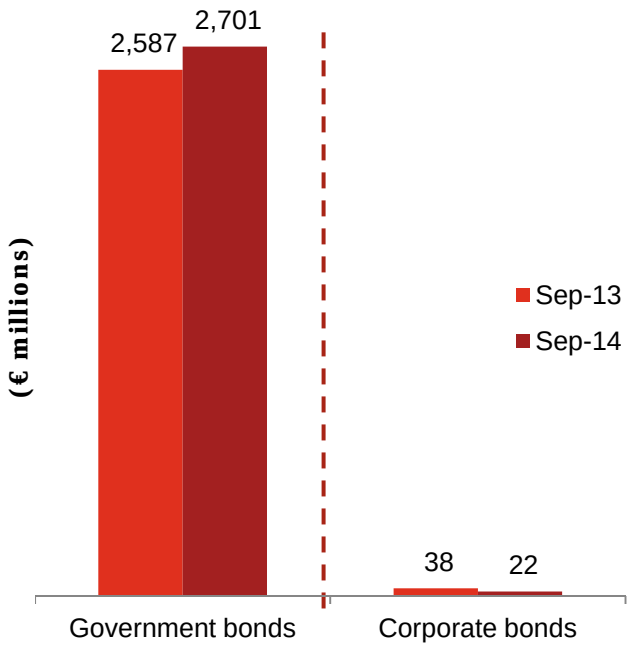
We analyse the market impact of structural reform in the EU banking sectors through two lenses. Firstly, the impact on the banks themselves, and secondly, the importance of banks to individual capital markets. Where there is a significant bank impact and banks are particularly important to those markets, we project the most substantial impacts.

| | Investment banking | | FICC | | | | | Equities sales and trading | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | DCM Bonds & Loans | M&A & ECM | FX | Rates | Credit | Commodities | Securitisation | Cash equities | Derivatives | Prime Services |
| **Bank annual cost impact (€ billions)** | **1.0** | **0.6** | **2.0** | **5.8** | **4.1** | **1.0** | **0.5** | | **3.8** | |
| **Importance of investment banks to market** | Banks are key full-service providers, but require underwriting capacity | | Deep liquidity provided by range of market participants | Critical role using bank balance sheets to hold inventory to support market making activities | | Range of other non-bank market participants | Banks central to securitisation market, creating securitised assets | Key role provided by banks as agents | Key role provided by banks as agents | Only provided by banks |
| **Overall market impact** | **Moderate pricing impact and little demand response as services are inelastic** | | **Small impact in major currency pairs** | **Reduction in liquidity, increase in liquidity risk premium and wider bid/ask spreads. Impact concentrated in less liquid instruments from issuers with higher credit risk** | | **Continued exit by investment banks, leaving market to commodities traders, corporates, hedge funds** | **Continued weak securitisation market in Europe** | **Few banks expected to leave market as a full service is required. Some re-pricing expected which will impact institutional investors costs and end-investor returns** | | **Moderate pricing impact and little demand response** |

Source: Coalition, PwC
AFME: Structural reform study

# *Quantitative Easing has enhanced global liquidity, but this is masking structural illiquidity across non-sovereign bond markets*

**Average monthly volumes traded**




**Policymakers across the globe are concerned about structural changes in market liquidity**

- "Market liquidity is structurally lower now than it was in the past. This will quickly become apparent in a down market." **Guy Debelle, Assistant Governor, Australian Central Bank, 2014.**
- Though the banking system may be safer than it was before 2008, parts of the markets may have become more dangerous for unwary investors." **FT, 2014.**
- "Regulation has resulted in a 'structural decline in dealers' ability to warehouse risk due to capital requirements. Any herding to the exit in response to a shock could affect the supply of market-based finance to the economy" **Bank of England FSR, 2014.**
- "Liquidity risk premia on US high-yield corporate bonds are around 70 basis points below their historical average level... [a correction would translate into] a fall in their market value of around US$60 billion...investors are underestimating the probability of losses on these securities." **Bank of England FSR, 2014.**
- As banks withdraw from market-making activities, liquidity has fallen" **ECB FSR, 2014**.
- "As investors are under-pricing liquidity risk, liquidity risk premium will adjust, and we will try to refrain from saying 'I told you so.'", **Mark Carney, Governor, BOE, 2014**.

Turnover in European government bond market was **185x turnover** in corporate IG bond market in Sep-14.

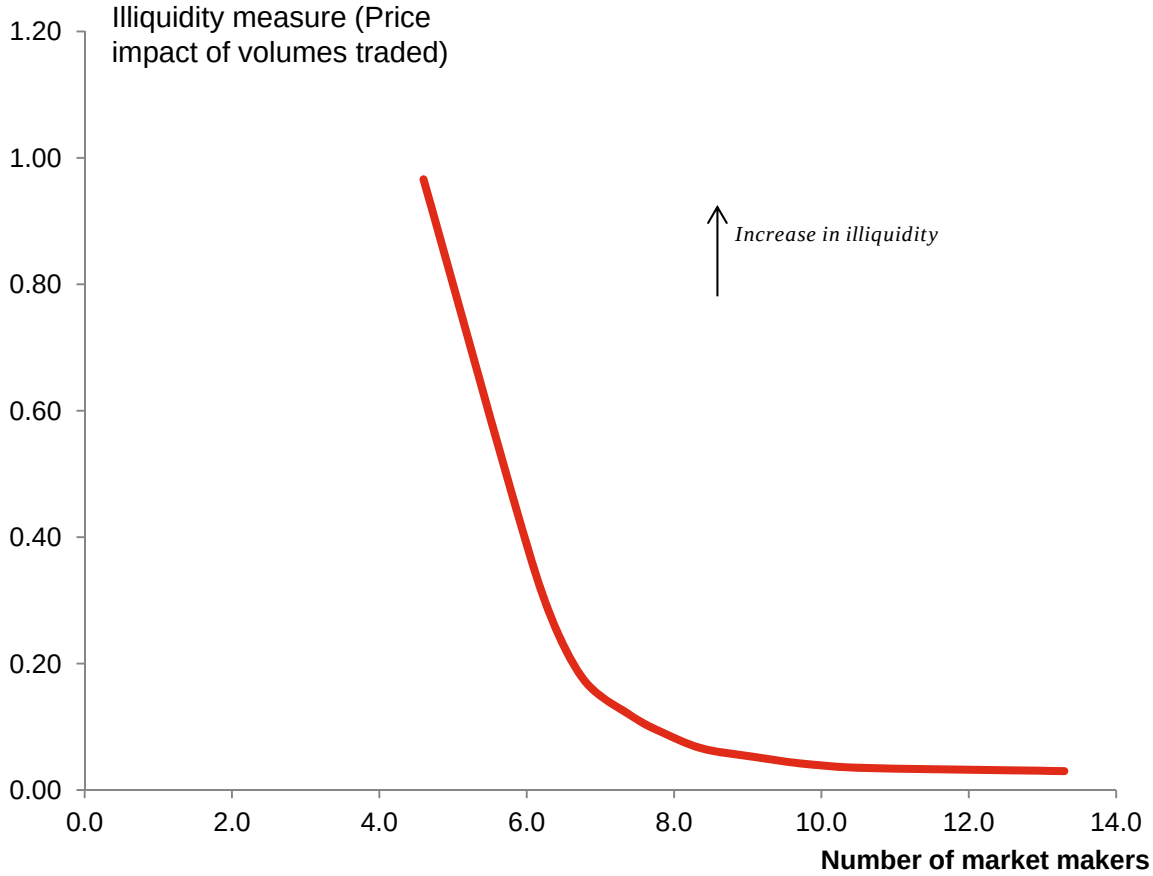
Average outstanding amount of government bonds was **26x the average outstanding amount** in corporate IG bonds in Sep-14

Liquidity risk is government bonds was **9x lower than liquidity risk** in corp-IG bonds in Sep-14

Source: Trax and PwC analysis
AFME: Structural reform study
PwC

# *Banks provide key market making activity in corporate bond markets.*

**Relationship between the number of market makers and liquidity**




Market makers are catalysts in corporate bond markets. They absorb order imbalances by holding inventory, which results in an increase of speed and probability of buyers and/or sellers meeting a match i.e. liquidity. Banks price in the cost of holding inventory in their bid-ask spreads. A higher number of market makers increases competition, reduces concentration, which result in smaller spreads and lower liquidity risk.

Larger inventory holdings have higher capital costs. Therefore, there is also a reverse feedback loop as banks are more likely to operate in more liquid markets for higher profits.

FICC markets are already very concentrated as the top 3 investment banks hold 42% of total revenues. Likely exits in the future could have extremely detrimental impacts on levels of liquidity, liquidity risk premia as well as liquidity risk.

Source: Trax and PwC analysis
AFME: Structural reform study
PwC

# *If banks with sub-economic performance withdraw from FICC markets following structural reform, market liquidity could contract costing corporate borrowers c.30bps.*

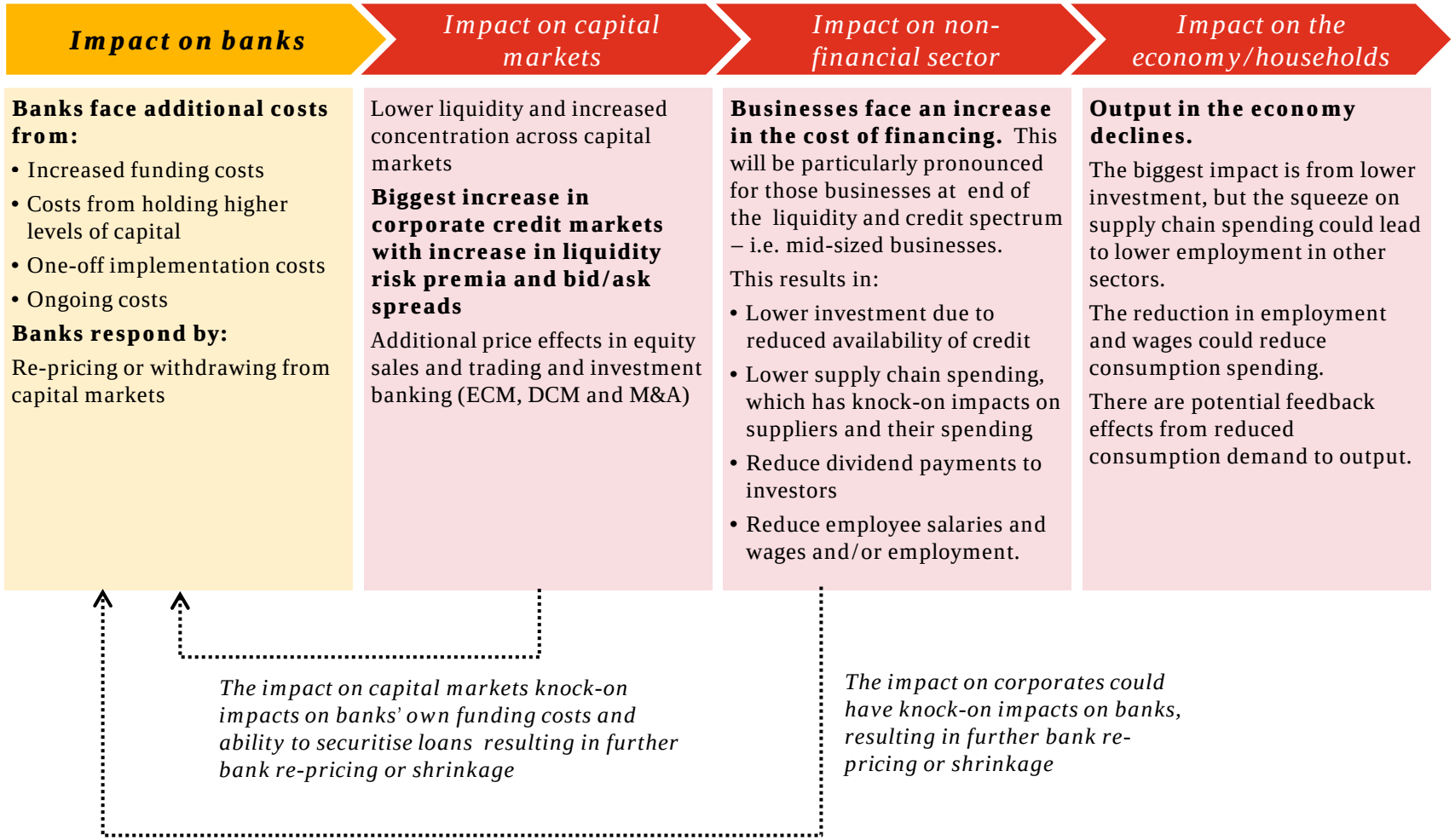
**Impact on corporate borrowing costs at different levels of liquidity**

| Amihud (percentage points) | | 0.00 | 0.70 | 1.40 | 2.10 | 2.80 | 3.50 | 4.20 | 4.90 | 5.60 | 6.30 | 7.00 | 7.70 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Liquidity score | | 0.00 | -0.25 | -0.50 | -0.75 | -1.00 | -1.25 | -1.50 | -1.75 | -2.00 | -2.26 | -2.51 | -2.76 |
| Liquidity variability (bps) | | 0.00 | 0.58 | 1.17 | 1.75 | 2.34 | 2.92 | 3.50 | 4.09 | 4.67 | 5.26 | 5.84 | 6.42 |
| Change in number of market makers | 0 | 0.00 | -0.01 | -0.03 | -0.04 | -0.06 | -0.07 | -0.08 | -0.10 | -0.11 | -0.13 | -0.14 | -0.15 |
| | -1 | 1.91 | 3.80 | 5.69 | 7.58 | 9.46 | 11.35 | 13.24 | 15.12 | 17.01 | 18.90 | 20.79 | 22.67 |
| | -2 | 3.83 | 5.71 | 7.60 | 9.49 | 11.38 | 13.26 | 15.15 | 17.04 | 18.93 | 20.81 | 22.70 | 24.59 |
| | -3 | 5.74 | 7.63 | 9.51 | 11.40 | 13.29 | 15.18 | 17.06 | 18.95 | 20.84 | 22.73 | 24.61 | 26.50 |
| | -4 | 7.65 | 9.54 | 11.43 | 13.31 | 15.20 | 17.09 | 18.98 | 20.86 | 22.75 | 24.64 | 26.53 | 28.41 |
| | -5 | 9.56 | 11.45 | 13.34 | 15.23 | 17.11 | 19.00 | 20.89 | 22.78 | 24.66 | 26.55 | 28.44 | 30.33 |
| | -6 | 11.48 | 13.36 | 15.25 | 17.14 | 19.03 | 20.91 | 22.80 | 24.69 | 26.58 | 28.46 | 30.35 | 32.24 |
| | -7 | 13.39 | 15.28 | 17.16 | 19.05 | 20.94 | 22.83 | 24.71 | 26.60 | 28.49 | 30.38 | 32.26 | 34.15 |
| | -8 | 15.30 | 17.19 | 19.08 | 20.96 | 22.85 | 24.74 | 26.63 | 28.51 | 30.40 | 32.29 | 34.18 | 36.06 |
| | -9 | 17.21 | 19.10 | 20.99 | 22.88 | 24.76 | 26.65 | 28.54 | 30.43 | 32.31 | 34.20 | 36.09 | 37.98 |
| | -10 | 19.13 | 21.02 | 22.90 | 24.79 | 26.68 | 28.56 | 30.45 | 32.34 | 34.23 | 36.11 | 38.00 | 39.89 |
| | -11 | 21.04 | 22.93 | 24.82 | 26.70 | 28.59 | 30.48 | 32.37 | 34.25 | 36.14 | 38.03 | 39.91 | 41.80 |

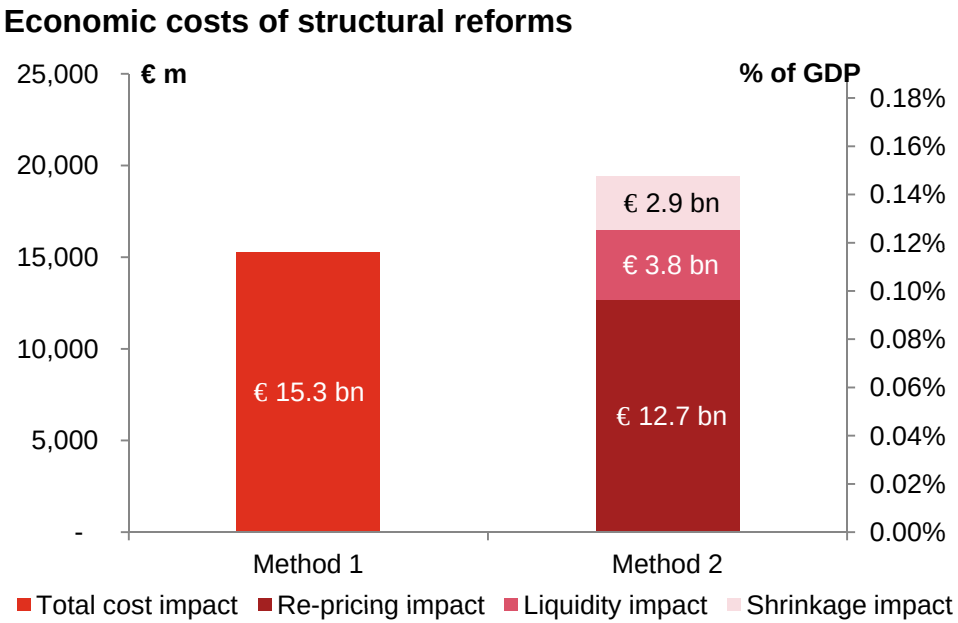
Source: PwC analysis. For more details on the methodology see Appendix 4 of main report

# *The impact on end-users*

# The impact of structural reforms could have knock-on impacts on the non-financial sector and the wider economy



# *Our analysis suggests that economic costs are considerable*




| Reduction in | Method 1 (% relative to baseline) | Method 2 (% relative to baseline) |
|---|---|---|
| **GDP** | €15.3 billion (0.12% of EU 2013 GDP) | €19.4 billion (0.15% of EU 2013 GDP) |
| **Employment** | 249,000 (0.12% of total EU 2013 employment) | 316,000 (0.15% of total EU 2013 employment) |

Source: PwC analysis. The results shown are based on the median of the BCBS' Macroeconomic Assessment Group estimates on the relationship between bank lending spreads and GDP (2010).

**The economic costs of structural reform could be significant. We use two approaches to assess the cost:**

**Method 1** captures the impact of banks re-pricing across the industry (before any exit), resulting in higher cost of credit for non-financial corporates. This approach is typically used by government and other regulators in assessing the cost and benefits of reforms. Method 1 yields total economic costs of €15.3 bn across the EU (0.12% of 2013 GDP).

**Method 2** captures a range of impacts, including the impact of banks re-pricing for banks who remain in corporate bond markets, the impact of FS sector shrinkage (due to exits), and resulting liquidity impacts and multiplier effects. Method 2 yields total costs of €19.4 bn across the EU (0.15% of 2013 GDP).

The reforms could also cause job losses in the order of 0.12%-0.15% of total employment across the EU. The shrinkage of the banking sector is equivalent to 0.3% of banking sector GVA.

# BSR will increase in the cost of credit for corporate borrowers and reduce the value of pension funds

| | | |
|---|---|---|
| 1 | ***Increase in cost of finance for borrowers*** | • A 25% increase (30 bps) in borrowing spread on capital markets<br>• Higher impacts for corporates with higher credit risk: top 10% of firms most sensitive to changes to the cost of debt will experience a reduction in profits of at least 5%<br>• c.10% increase in banking advisory fees (debt and equity issuance costs) |
| 2 | ***Reduction in returns to investors*** | • Investors will have to pay more (12 bps) to trade in corporate debt. This will impact long-term returns.<br>• Compounded lower returns (over a 40-year working life), amounts to a 5% reduction in investment value<br>• Higher corporate yields also translate into value losses. Investors could face mark-to-market losses of 3% on their corporate bond holdings (€82bn) |
| 3 | ***Higher administrative costs to businesses*** | • Businesses (and investors) will have to engage with multiple banks to serve their full banking needs<br>• Additional costs to re-document relationships (know-your-client procedures) |
| 4 | ***Small retail impacts but potential knock-on impacts on lending*** | • Diminished access for smaller businesses to hedging and other risk management tools<br>• Core credit institutions may need to reduce LTV of mortgage books, making it more difficult and expensive for first-time buyers to obtain mortgages<br>• The impact of structural reform on securitisation markets could have a negative impact SME loan and residential mortgage securitisations |

*Source: PwC analysis*

# *Supporting material*

# *We consider econometric techniques using bank funding costs to be a more robust approach for assessing implicit guarantees compared to analysis of credit support ratings.*

We consider econometric techniques focusing on banks' funding costs (as measured by spreads of traded debt to government benchmarks) to be a more direct and robust estimate of any funding cost advantages for EU G-SIB banks. We use this approach to provide an updated estimate of the implicit subsidies for EU banks.

| Approach | Notable papers | Pros | Cons |
|---|---|---|---|
| **Funding advantage models – bond spreads** | GAO (2014), Oliver Wyman (2014) Acharya, Anginer, Warburton (2013), Balasubrammian, Cyree (2012), | Statistically robust outputs, data intensive and market driven, based on sound relationships, isolate impact of key drivers, widely used in the literature. | Model specification challenges, data quality and granularity, parameter selection and regression validity, limited proportion of overall funding, |
| **Funding advantage models – deposit rates** | Oliver Wyman (2014) Jacewitz, Pogach (2013) Araten and Turner (2012) Baker and McArthur (2009 | Statistically robust outputs, market driven, based on sound relationships, isolate impact of key drivers, often used in the literature. | Model specification challenges, data quality and granularity, parameter selection and regression validity, deposit markets variation across EU countries (consumers, regulation) |
| **CDS Spreads analysis** | IMF (2014), Oliver Wyman (2014), Tsesmelidakis and Merton (2012), Moody's (2012) | Often used by rating agencies, CDS spreads capture credit, priced by market and investors. | Might capture other risk factors (like liquidity premium), assessment shaped by assumptions and difficult to quantify. |
| **Funding advantage models – credit ratings** | IMF (2014) Haldane (2010) Udea & Di Mauro (2012), OECD (2012), Soussa (2000) | Rating uplift as direct estimate for the level of Government support, captures credit risk and provides a useful benchmark, widely used. | Subjective assessment shaped by rating agencies assumptions, imperfect link to actual debt cost, ratings are impacted with a lag. |
| **Contingent claims approach, market acquisitions (event analysis)** | Oxera (2011) Brewer and Jagtiani (2011) Gandhi and Lustig (2011) | Forward looking perspective, driven by market pricing information. | Extremely sensitive to underlying assumptions, option pricing framework implicitly assumes a subsidies exist. |

# *Our econometric analysis does not suggest a funding cost benefit for G-SIB banks compared to non G-SIBs.*

| Bank funding spread | 2013m1 / 2014m6 |
|---|---|
| Constant | -811.48 |
| Lag of spread (A) | 0.57*** |
| Year to maturity (B) | 2.83* |
| Total asset (C) | -1.32 |
| Leverage (D) | 981.01* |
| Modified Merton (E) | -124.87* |
| ROAE (F) | -0.17 |
| GSIB (G) | -4.14 |
| Country dummies (H) | Yes |
| Number of observations | 8,946 |
| Tests | |
| Nickel Bias | **Passed** |
| Arellano – Bond test AR (2) | **Good** |
| Hansen test | **Good** |

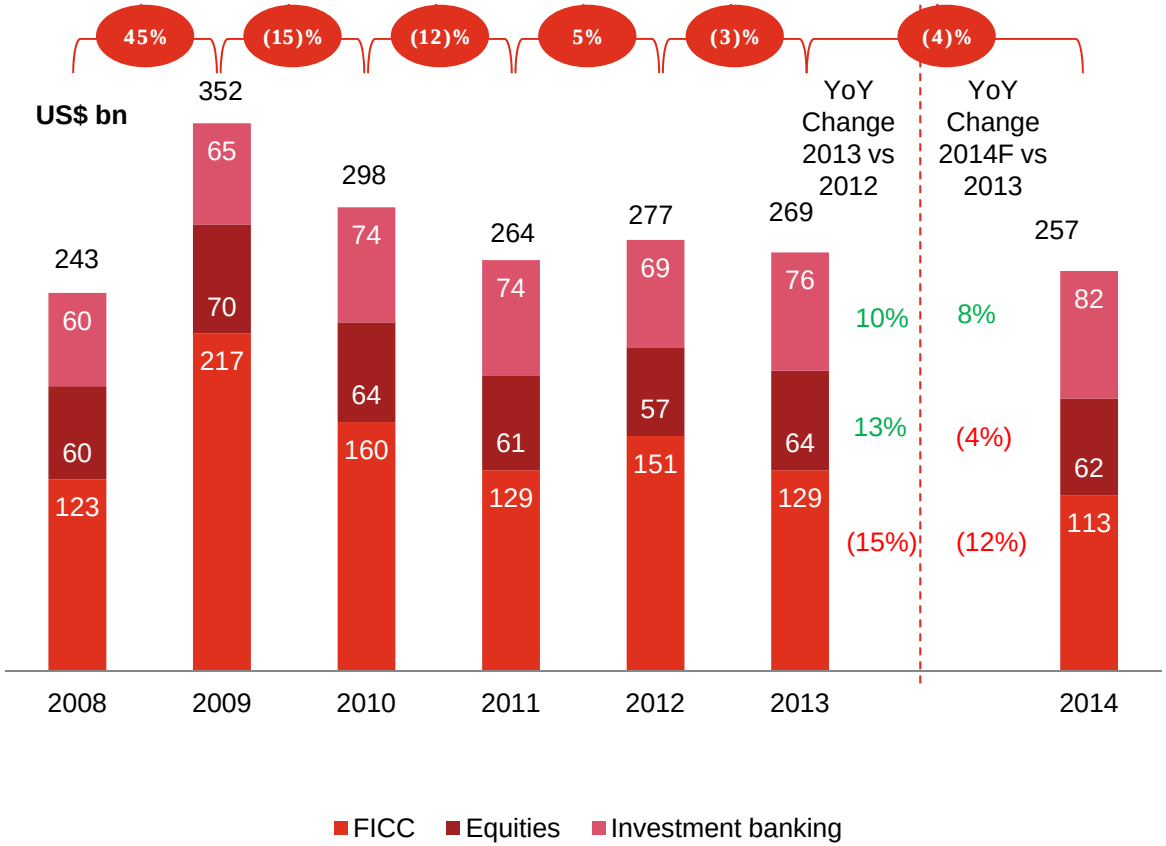
* Significant at 10% level, ** significant at 5% level, *** significant at 1% level

- Increases in total assets reduces spread, although the impact is minimal and insignificant
- As leverage increases (as represented by the proportion of non-equity used to fund assets) the spread to benchmark increases – the coefficient is statistically significant at 10% level
- Credit risk is a statistically significant driver of spread differences – as distance to default increases spread decreases.
- ROAE coefficient is low and negative (implying as ROAE increases spread decreases) but is statistically insignificant.
- **The G-SIB coefficient is low and negative (i.e. G-SIBs have 4 basis point lower funding cost) but statistically insignificant during the most recent time period. On balance, this suggests that G-SIBs do not currently benefit from an implicit subsidy**
- The model passes the various instruments validity test hence the specification is valid for this period.
- **Given the significant progress made in the recent past and continued regulatory reform across the EU and globally, implicit subsidies should not return to levels implied at the last financial crisis**.

Source: PwC analysis

# *Fixed income currencies and commodities (FICC) is the fastest falling segment of investment banking (down 15% in 2013)*

**Global Capital markets revenue pools**

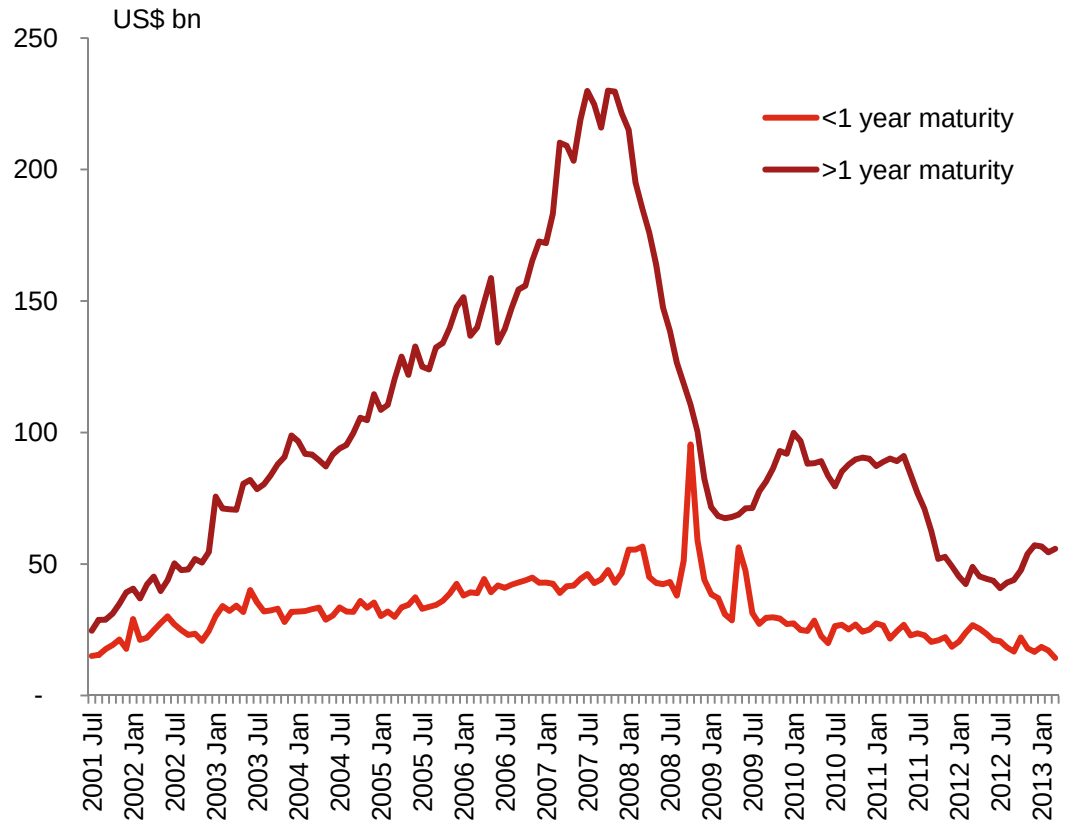



- Overall investment banking revenues are projected to decline in 2014. FICC altogether make up around 48% of global investment banking revenues in 2013.
- Banks are selectively exiting, retrenching or re-pricing in specific FICC markets. This is further supported by declining FICC revenues shown in this exhibit.
- Whereas banks are making decisions to exit the entire equity sales and trading business, banks are being more selective in which areas of FICC to concentrate on.
- This is driving up concentration. The global revenue share for the top 3 banks in FICC has risen from 32% in 2009 to 45% in 2013.

Source: Coalition
AFME: Structural reform study
PwC

# *Evidence of structural illiquidity*
# *Corp bonds inventory holdings in the US*

**Corporate bond inventories held by US dealers**




Source: Federal Reserve Bank of New York

Market makers must buy inventory to match buyers and sellers and therefore principal risk. A fall in primary dealer holdings of inventory since the crisis suggests slowing trading activity in bond markets. Financial regulation is also driving banks to off-load corporate bond inventories.

As noted by the FT: *"But the thorniest issue is regulation. Since 2008 banks have slashed their inventories by between 30 and 80 per cent (depending on the asset class) to meet tighter rules"*

Reporting of corporate bond transactions in the US is regulated and is therefore publicly-available. There is currently no equivalent reporting requirement in Europe.

# *Sample of banks included in our study*

| | |
|---|---|
| Arbejdernes Landsbank | Handlowy w Warszawie |
| Banca Generali | Helaba |
| Banco Santander, S.A.* | HSBC Holdings plc* |
| Bank of America Corporation* | ING |
| Barclays PLC* | JPMorgan Chase & Co.* |
| Bayerische Landesbk | KBC |
| BBVA | Landsbk Baden-Württ. |
| Belfius Banque | Lloyds Banking Group plc* |
| BNP Paribas SA* | Mediobanca |
| Citigroup Inc.* | Monte Paschi Siena |
| Commerzbank AG* | Morgan Stanley* |
| Credit Agricole S.A.* | NIBC Bank NV |
| Credit Suisse Group AG* | Nordea |
| Danske Bank | Portigon |
| DekaBank Deutsche GZ | Royal Bank of Scotland Group plc* |
| Deutsche Bank AG* | SEB |
| DiBa Bank | Societe Generale Group* |
| DNB ASA | Spar Nord Bank A/S |
| DZ Bank AG | Standard Chartered |
| FIMBank | Swedbank |
| Goldman Sachs Group, Inc.* | UBS AG* |
| Groupe BPCE | UniCredit S.p.A.* |
| Handelsbanken | |

Note: * indicates G-SIBs for which we undertook detailed bank segment analysis