THE BOSTON CONSULTING GROUP

Bridging to Brexit: Insights from European SMEs, Corporates and Investors

Assessing changes needed to the provision and use of wholesale banking and capital markets services

Finance for Europe

CLIFFORD CHANCE

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July 2017

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Foreword

One year on from the UK's referendum vote to leave the European Union, there is still much uncertainty about what Brexit will mean for SMEs, large corporates and investors. What is clear, however, is that the impact of Brexit will be far reaching and that information on the potential effects on the real economy is needed to support policy decisions.

For this reason, we commissioned The Boston Consulting Group to undertake an analysis of the possible impacts of a "hard Brexit" on European end users of wholesale banking and capital markets services. This report forms part of AFME's pan-European fact-based approach to Brexit. The AFME Clifford Chance publication on the legal and regulatory aspects of the UK referendum, the *Planning for Brexit* report produced by PwC for AFME, and the *Implementing Brexit* report all provide information for policymakers on the scale of the challenges that Brexit will create. This latest report will further this work by assessing the potential disruption that SMEs, large corporates and investors could face to their use of wholesale banking and financial markets services in a hard Brexit scenario.

AFME has also done a significant amount of work over recent years to analyse how European economic growth can be supported by developing deeper capital markets and increasing funding for SMEs and corporates. Our series of growth reports, including *Bridging in the Growth Gap*, have assessed how SMEs and corporates can gain greater access to financing, helping them to invest and grow.

The findings of this report indicate that the impact of a hard Brexit on financial markets will not only be a challenge for banks, but will have wider implications for the real economy. The resulting potential fragmentation creates an even greater need for implementation of the Capital Markets Union initiative, of which AFME is a strong supporter.

During the forthcoming political negotiations, we ask that regulators and policymakers remain focused on what is at stake: continued financial stability of the pan-European capital markets and future economic growth.

We hope this report will provide helpful feedback from the end users who were interviewed as well as supporting data, which can be referenced in the forthcoming discussions on the future relationship between the European Union and the UK.

Thanks to Clare Francis of Lloyds for chairing the group who supported the production of the report and her colleague Nick Burge. Thanks also to Chris Bates at Clifford Chance and my colleagues at AFME led by Rick Watson.

Simon Lewis
Chief Executive
Association for Financial Markets in Europe

Introduction

Introduction

What will Brexit mean for companies and investors in the EU27 and UK, especially those that now do business across the border that will soon be created between them?

The answer depends on the arrangements ultimately agreed between the EU27 and UK. If free trade and the free movement of people are maintained, the effects will be minimal. However, the outcome of negotiations may be a "hard Brexit" with material barriers to trade and the movement of people erected between the EU and the UK. To "pressure test" the impact of Brexit on wholesale banking and the broader economy, we have based our report on a hard Brexit scenario – both in our quantitative analysis and interviews. (See the Appendix for a more detailed definition of a hard Brexit).

Companies and investors in the EU27 and UK are likely to incur direct costs from a hard Brexit. They are also likely to be affected indirectly, via the wholesale banking and markets products and services they consume (for simplicity, referred to as "wholesale banking services" throughout this report). A hard Brexit could remove UK-incorporated banks from the "passporting" regime that now allows a bank licensed in the UK to operate anywhere in the EU27, potentially increasing their capital and operational costs. Companies and investors may then find it more difficult to obtain equity capital, debt funding, risk management and other wholesale banking services, especially when supplied across the new border.

This indirect effect of a hard Brexit is the focus of this report. It examines the implications of a hard Brexit for the EU27 and UK banking system, and what banks would need to do to maintain their cross-border provision of wholesale banking services (see Section 3).

We have drawn heavily on the expectations of the end-users of wholesale banking, interviewing 62 CEOs and treasurers of large corporates, investors and SMEs, along with 10 industry associations who represent a wide range of companies and sectors.

Most of our interviewees expect any challenges or increased costs to be absorbed by their banks. But this may be overly optimistic. The loss of passporting may cause some banks operating in the EU27 through a UK banking license to withdraw from the EU27, reducing the aggregate banking capacity available to companies and investors. The alternative option, of maintaining EU27 operations via subsidiarisation, is likely to be slow and costly. Our analysis attempts to quantify the size of these effects and their implications for the end-users of wholesale banking.

Any estimate of this kind is unavoidably uncertain. Ours should be interpreted as an upper bound – that is, as a worst case.

Interview Participants

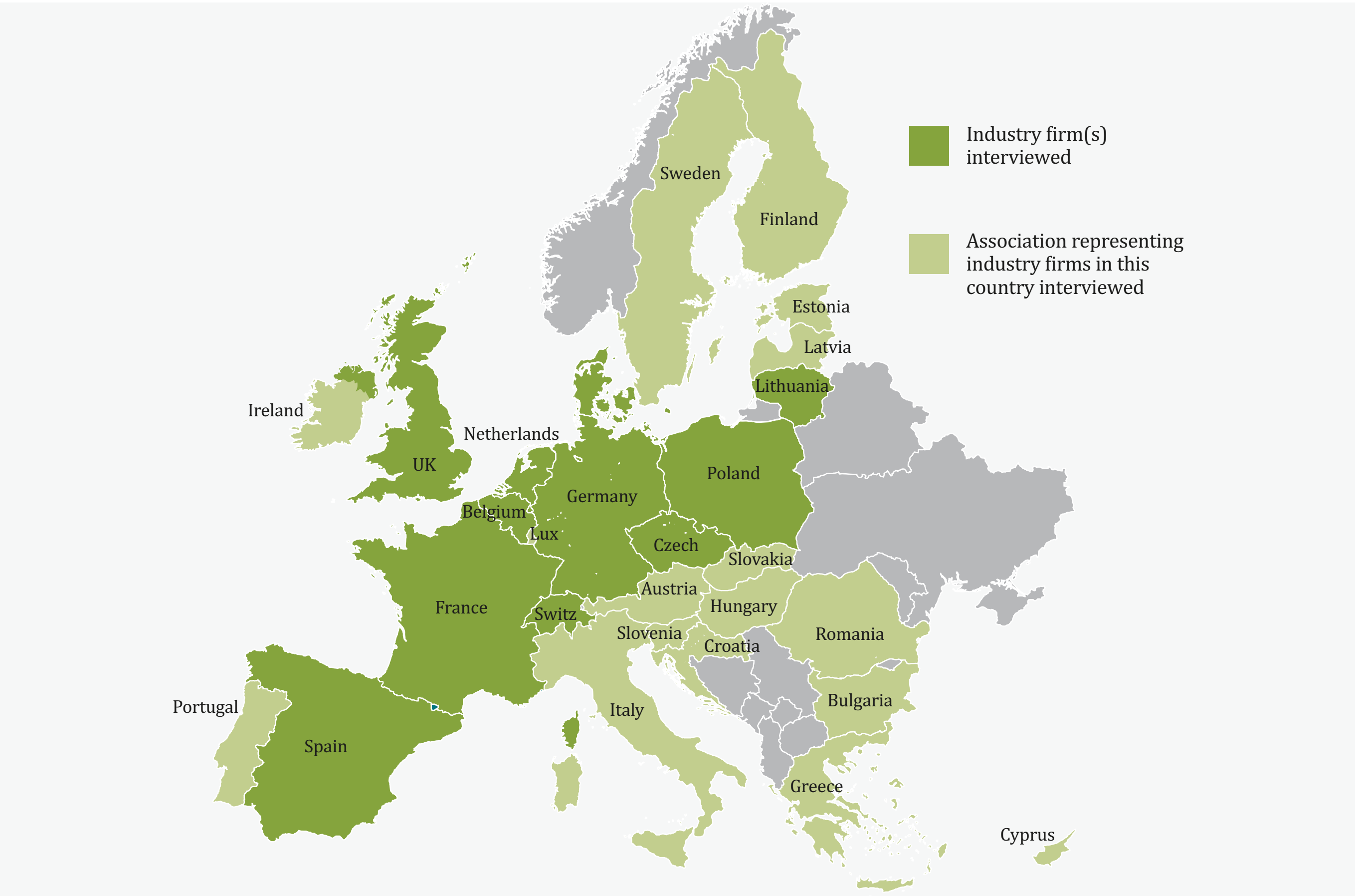
In the course of preparing this report, BCG interviewed treasurers and CEOs of small-to-medium enterprises (SMEs), large corporates and investors. Twenty-three percent of these industry interviews were with SMEs, 43% with large corporates and 34% with investors. Fifty-two per cent of interviewees were based in the EU27 and 48% in the UK. Figure 1 depicts the geographical coverage of industry interviewees.

SMEs[1] operating in multiple sectors (including manufacturing, IT, consumer goods and consumer services) were interviewed along with industry associations that represent them. Respondents include a pan-European SME association representing over 12 million individual businesses throughout the EU-28, and several national associations represent more than 10,000 SMEs in aggregate.

BCG also interviewed executives from large corporates across all sectors, including consumer goods, consumer services, utilities, industrials and manufacturing, basic materials, oil & gas, technology, media & telecommunications, defence and healthcare. In terms of market capitalisation, these interviewees represented 22% of the Euronext 100 index and 22% of the FTSE 100 index. We have also spoken with treasurers and business associations representing thousands of corporates.

Within the investor category, BCG interviewed leading asset managers, insurers, pension funds and private equity & venture capital funds, as well as the associations which represent these organisations and marketplace infrastructure firms. The asset management firms interviewed represent approximately 42% of European (currently including the UK) assets under management (AuM). Associations representing around €23 trillion in AuM through their constituent member associations and corporate members were also interviewed.

Figure 1: **Interviewee coverage by country**



1 For the purpose of this report, firms with annual turnover of less than €250 M were categorised as SMEs, whilst those with annual turnover greater than €250 M were included as large corporates

We are grateful to these firms and the individuals who contributed their time and thoughts. Some of the participants wish to remain anonymous; the rest are identified below. Opinions expressed in this report reflect the authors' views, and not necessarily those of the firms interviewed.

SMEs

Large corporates

Investors

Associations

The chartered professional body for treasury

Represents interests of approximately 1300 European industrial enterprises, 80% of which are SMEs

Represents interests of around 10,500 SMEs in Ireland

Represents 330 Luxembourg members, of which around 175 are corporate treasurers

Representative association for the European investment management industry and through its 28 member associations and 62 corporate members represents EUR 23 trillion in AuM

Represents interests of Polish listed companies

Speaks on behalf of 190,000 UK businesses of all sizes and sectors

Represents 600 member firms and 600 affiliate members from Europe's private equity, venture capital and infrastructure sectors

Represents interests of around 12 million SMEs throughout Europe

Executive Summary

Executive Summary

- **A hard Brexit might harm European businesses by reducing their access to wholesale banking services or increasing the costs of those services.** To examine this issue, we interviewed 10 associations representing thousands of small-to-medium enterprises (SMEs), large corporates and investors across Europe and the UK, and conducted 62 in-depth interviews with company treasurers, CEOs and CIOs. We also estimate the current EU27 banking capacity that now depends on passporting from the UK and may therefore be affected by a hard Brexit.

- **Businesses and investors are worried primarily about the direct impacts of a hard Brexit.** Business concerns include barriers to trade, movement of labour, increased compliance and customs costs and, more generally, the ability to operate freely across the new border. Investors are worried their ability to raise and distribute funds will be hampered.

- **Brexit-driven concerns relating to wholesale banking services are sector specific.** Both SMEs and large corporates are worried about access to credit and they fear risk management will become more expensive. Investors are concerned that Brexit will induce a complex exercise of re-documenting existing derivatives and other trading relationships. To illustrate these concerns, we present real-life case studies and quotes derived from the interviews.

- **Though they recognise the challenges, businesses generally expect banks to handle any post-Brexit wholesale banking-related difficulties.** Most businesses we interviewed told us that they expect their banks to address all the challenges and absorb all the costs that Brexit could create in the wholesale banking sector. They expect banks to support them through the Brexit journey, and to continue providing wholesale banking services as before.

- **Our "supply side" analysis suggests that businesses may underestimate the banking-related effects of a hard Brexit.** In aggregate, approximately €1,280 billion of bank assets (loans, securities and derivatives) may need to be re-booked from UK to EU27 following a hard Brexit, unless alternative arrangements can be agreed. These assets are supported by €70 billion or approximately 9% of the (Tier 1) equity capital of the banks affected. The total regulatory capital requirement, taking into account Tier 2, TLAC debt and buffers, could double this figure to €140 billion.[2]

- **Securities and derivatives trading is concentrated in London, and has the greatest potential for disruption.** Trades with EU27 clients now booked in the UK are estimated to amount to €380 billion in risk-weighted assets, or €1,100 billion in trading assets (securities and derivatives), the notional amount being multiples higher. This represents approximately 68% of all trading with EU28 clients booked in the UK. This business is supported by €57 billion of bank equity capital. A significant portion of this exposure may need to be re-booked to the EU27 following a hard Brexit.

- **A potential movement of EUR-denominated clearing from the UK to the EU27 would also affect bank clients.** We estimate that approximately €30-40 billion of additional initial margin would need to be posted by banks, an increase of 40-50%, the cost of which will need to be allocated between banks and clients on an individual basis. The movement of EUR swaps to a EU27 CCP would also necessitate additional default fund contributions from clearing members, which we estimate to be €3-4 billion, an increase of 20-30%. This could also require banks to hold an additional €1 billion of equity capital, though the figure could be much higher if there are material losses in compression benefits.

- **Bank lending may also be affected, though to a lesser extent.** The total loan exposure of UK-incorporated banks to EU27 SME and large corporate clients is estimated to be €180 billion (4% of total loans outstanding to EU27 large corporates & SMEs). This lending is supported by about €13 billion of equity bank capital currently domiciled in the UK. The loss of passporting may cause some UK-incorporated banks to withdraw from the EU27, reducing aggregate lending capacity there, at least temporarily.

2 Throughout this report "equity capital" refers to Tier 1 capital and not total regulatory capital (which would include non-equity instruments)

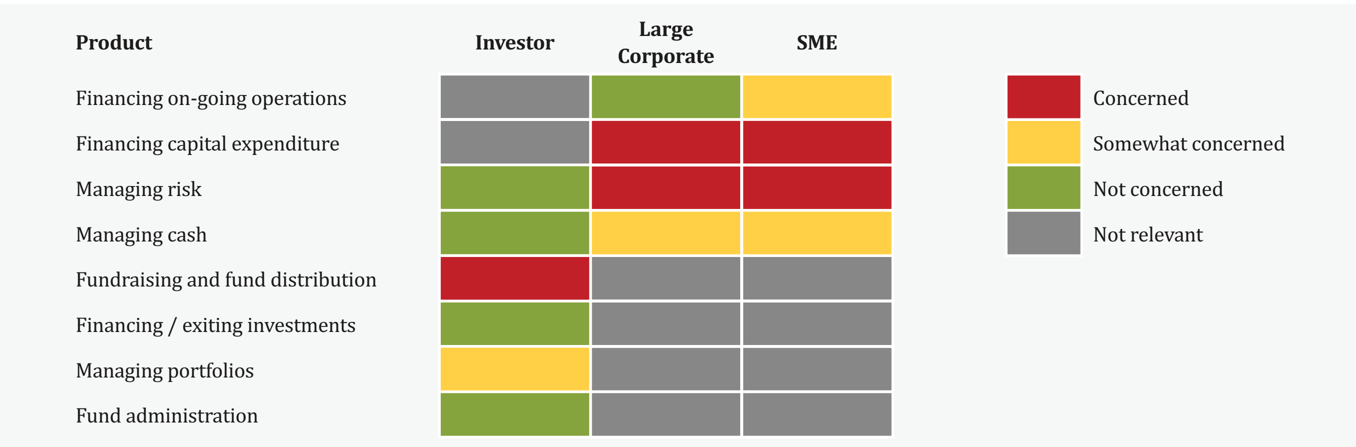
- **Aggregate banking capacity could be maintained if banks currently operating with UK banking licences create subsidiaries in EU27 jurisdictions. The process to do so, however, is likely to be costly due to additional capital and operational change required.** The cost of restructuring could be as much as €15 billion, with the cost for each individual bank depending on its current geographical footprint and client focus. Amortised over 3 to 5 years, this could reduce return on equity for affected banks by 0.5 to 0.8 percentage points, a material impact. Furthermore, a Brexit-driven fragmentation would give rise to capital inefficiencies both in the short-term and long-term. We estimate that the long-term inefficiencies could require banks to hold as much as €20 billion of additional equity capital equity capital, or €40 billion of total regulatory capital taking into account Tier 2, TLAC debt and buffers. Brexit would add to the many challenges and requirements banks already face, such as compliance with MiFID II and with the upcoming revisions to Basel regulations.

- **A hard Brexit could lead to higher costs and more restricted access to wholesale banking services than our interviewees expect, with SMEs potentially hardest hit.** The scale and bargaining power of large corporates and investors mean that many of them would more easily navigate the effects of a hard Brexit on wholesale banking. SMEs may find it harder. Not only are they more likely to find their access to wholesale banking services restricted, but the cost of making adjustments, such as forming new banking relationships, can be material for them. Of those who commented, approximately 55% of our SME participants said they had made no plans so far for Brexit, compared with only 27% who have carried out some internal planning and around 18% who have executed plans.

- **For the scenario of a hard Brexit, our interviewees have suggestions for policy makers, which are supported by our "supply side" analysis.** These include a transition period to give users of wholesale financial services and their banks time to adjust, as well as a transition period in which risk-transfer mechanisms are permitted. Interviewees also suggested grandfathering of existing contracts and a degree of patience with respect to re-documenting contractual relationships in order to minimise the legal and operational disruption to banks and their clients. And they call for UK policy makers to consider replacing domestic capacity lost by the withdrawal of the European Investment Bank (EIB) and European Investment Fund (EIF).

- **Above all, businesses want the status quo preserved**. Of those interviewees who commented, 80% hope Brexit negotiations will result in no material change in their access to wholesale banking services or to the cost of them. Interviewees feel strongly that the political negotiations should keep in mind the impact of Brexit on the real economy end users of wholesale banking services.

Summary of interviewee concerns



Anonymous

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If we had to prioritise one thing, it would be to continue the freedom to provide financial services cross-border
//

The Client Perspective

Interview evidence including participant quotes and case studies

The Client Perspective

In preparing this report, interviews were conducted with three major client segments of wholesale banks – SMEs, large corporates and investors (along with industry associations who represent their interests). To put into context the significance of each of these client segments for the EU28 economy:

- **SMEs** account for around 67% of employment, and just under 58% of gross value added in the non-financial economy.[3]
- **Large corporates** represent 33% of employment and 42% of gross value added in the non-financial economy.[3]
- **Investors** contribute to the economy by providing capital to meet the short and long-term financing needs of businesses, banks and governments, as well as providing a return on savings. The asset management industry directly employs approximately 100,000 people and another 460,000 indirectly.[4]

Although generally confident that banks will absorb any costs imposed on them by a hard Brexit, many have some specific concerns relevant to their businesses. These are identified in the rest of this section, and a range of real life examples are given through case studies and quotes from the businesses affected:

- **Businesses are worried primarily about the direct impacts of hard Brexit will have on their businesses, such as barriers to trade.**
  Case study 1 discusses the post-Brexit issues around cross-border trade between the EU27 and UK for SMEs. Fourteen percent of UK SMEs import goods from suppliers in EU27 countries and 16% export goods to customers there.[3]
- **A hard Brexit might harm EU28 businesses by reducing their access to wholesale banking services.**
  Case study 2 highlights the difficulty of accessing finance across the new EU27/UK border. Even prior to Brexit, 15-20% of loan applications by EU28 SMEs are either rejected or the terms offered were unacceptable.[3]
- **SMEs may be the hardest hit by the effect of a hard-Brexit on wholesale banking.**
  Case study 3 looks at the issues Eastern European SMEs may face when financing their UK operations post-Brexit. In some Eastern European countries, SMEs account for over 75% of employment in the non-financial economy (Bulgaria, Estonia, Latvia and Lithuania), along with over 66% of gross value added generated by the non-financial economy (Lithuania and Estonia).[5]
- **Financing arms are concerned about the ability to operate freely across the border.**
  Case study 4 highlights the effects the loss of passporting could have on the financing arms of auto manufacturers. The EU28 automotive industry accounts for 6.5% of GDP[6], employs 12.2 million people throughout Europe and has a trade surplus of €100.4 billion with the rest of the world.[7]
- **Brexit-driven concerns relating to wholesale banking services are sector and business specific.**
  Case study 5 considers the possible effects of Brexit on the cross-border cash pooling of accounts.

3 European Commission: 2015 SBA Fact Sheet, United Kingdom

4 EFAMA, May 2017

5 European Commission: Annual report on European SMEs 2014/15

6 European Automobile Manufacturers Association

7 European Automobile Manufacturers Association: The Automobile Industry Pocket Guide, 2016-17

- **Large corporates fear access to capital markets will be reduced.**
  Case study 6 concerns securitised products sold by auto manufacturers to raise finance. In 2016, EU28 auto manufacturers raised €27 billion through asset backed securities (ABS)[8] which represented approximately 10% of total European securitisation issuance (€240 billion).[9] ABS transfers capital from pension funds and other investors to the automobile manufacturing industry.

- **Large corporates fear risk management will become more expensive and the cost of funding will rise.**
  Case study 7 demonstrates the impact an increase in the costs of wholesale banking products will have on the margins and profitability of a large corporate.

As throughout this report, all case studies assume a hard Brexit.

The rest of this section presents a synthesis of the views communicated by our interviewees.

8 Source: AFME

9 AFME: European Structured Finance, Q4: 2016

Case study 1: UK SME is concerned about increased tariffs and customs compliance

A UK seller of printed carrier bags for retail and promotional trade has an annual turnover of approximately £2 M. For many of its orders, the company deals with factories in the EU27 but also has partners in Asia. A significant proportion of its business is exhibition and promotional work, for which products need to be imported into the UK quickly.

When importing goods from China and Vietnam, there are extensive checks at ports, the length of which are unpredictable. The company therefore avoids its Chinese and Vietnamese suppliers when it needs goods quickly, instead importing from the EU27. Tariffs on Chinese and Vietnamese imports are also costly and administratively burdensome, with the company sometimes finding it difficult to establish the correct tax on goods. Currently, around 20% of headcount is devoted to dealing with imports and managing suppliers.

Should tariffs be imposed post-Brexit, imports from the EU27 may have to undergo the same process as those imported from China and Vietnam, resulting in significantly increased administration costs and a higher cost of goods. The company is also concerned about the possibility of more lengthy customs processes and goods being held up at ports, making it difficult to supply goods where they are needed quickly.

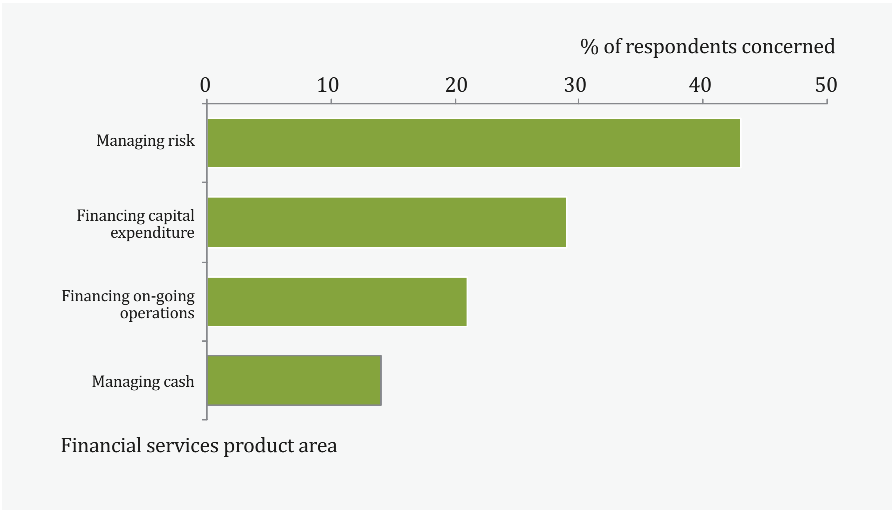
Small and Medium-Sized Enterprises (SMEs)[10]

In general, SMEs are most concerned about Brexit outcomes that would harm their businesses directly. They fear that trade barriers would reduce foreign demand for their products and increase the cost of imported inputs. Trade barriers will also increase the administrative burden of customs compliance, contributing to a rise in operating costs (see case study 1). If EU27 and UK regulations begin to diverge after Brexit, SMEs with business in both markets will find their compliance efforts duplicated and their costs increased, a prospect of particular concern for manufacturers.

With regards to wholesale banking services, 44% of SMEs who commented do not expect the effects of a hard Brexit on the banking sector to flow through to them. They expect banks to address the challenges, absorbing any additional costs and supporting SMEs through this important transition. Around 33%, however, fear they will be the first segment hit by any adverse effects. These SMEs worry about both price increases and restricted access to products and services. The remaining 22% of those who commented were unsure about whether they would be affected.

SMEs' concerns about wholesale banking services depend on the importance of those services to its particular line of business. (Figure 2).

Figure 2: **Degree of SME concern by product area**



Source: BCG

UK SME

//
SMEs are first in the firing line [when there is a credit squeeze]
//

10 For the purpose of this report, firms with annual turnover of less than €250 M were categorised as SMEs, whilst those with annual turnover greater than €250 M were included as large corporates

UK SME

//
Our contractors pay us on a quarterly basis – the amounts are too small for banks to want to get involved with forward buying for that
//

EU27 SME

//
Switching banks would not be easy; we would have to reconsider our whole system. This would be something new for us and we would find the process difficult
//

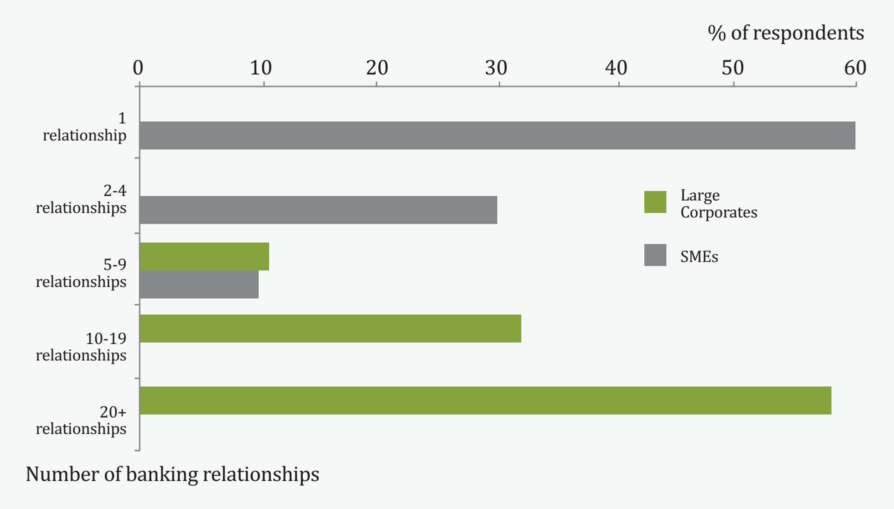
SMEs are concerned that they are more likely than large corporates to be affected by Brexit-related price increases in financial **risk management products**. Many would consider foregoing the use of hedging products to avoid paying the increased prices.

Several SMEs also expressed concerns about restricted access to these products, with some already facing risk or transaction-size thresholds from banks. The need to switch banks will only make their current arrangements more difficult to replicate (see case study 2).

SMEs generally rely more heavily on **trade finance products** than large corporates do. They will be harder hit by any capacity squeeze in this area and are more likely to be priced out of purchasing these products.

Given the nature of their banking relationships (local, long history, less transactional), SMEs face higher costs and greater difficulty than large corporates when building new relationships. This explains why more than half use only one bank. (Figure 3). In a post-Brexit world, large corporates can more easily switch suppliers to get the best product at the best price. SMEs will find this harder, and may suffer temporary disruption (see case study 3). This impact is compounded by their size; being smaller, they are less able to absorb shocks.

Figure 3: **Number of banking relationships: Large corporates vs. SMEs**



Source: BCG

Case study 2: UK SME concerned about access to finance

A UK business with annual turnover of around £60 M is a designer, producer and distributor of fancy-dress clothing. Its market is split roughly equally between the EU27, the UK and the rest of the world.

In anticipation of adverse impact from Brexit, such as potential tariffs or difficulties in accessing local financing, this business has begun to build a hub in the Netherlands, from which it plans to begin invoicing its EU27 clients. It also wants to set up an invoice discounting and an asset backed facility in the Netherlands, these services being critical for financing its ongoing operations. The firm will need to use a Dutch bank or another EU27 bank with significant operations in the Netherlands if its current bank chooses not to establish a subsidiary in the EU27.

Developing a new banking relationship in the Netherlands would be extremely time-consuming for the firm’s management, taking around six months to replicate what they now do with their bank in the UK. The firm is concerned that it may experience increased transaction costs from doing business with two banks and that, during the transition period, it may lose customers.

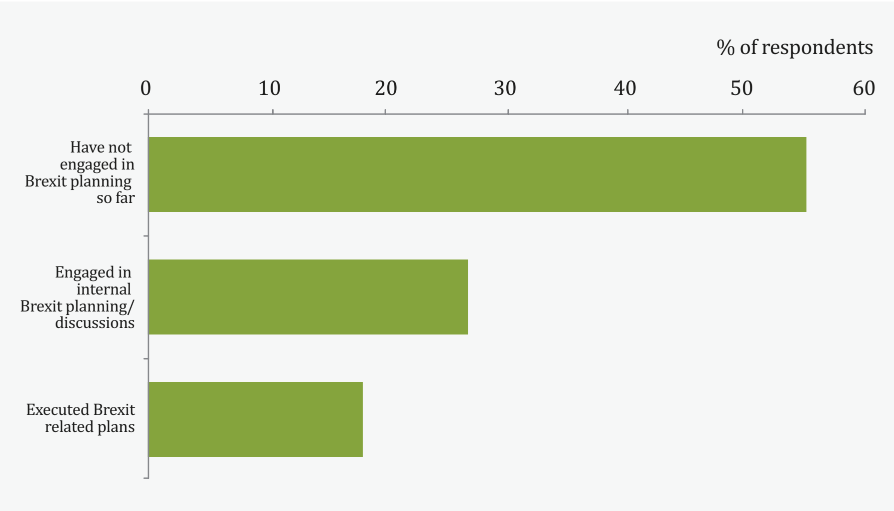
Case study 3: EU27 SME concerned about establishing new banking relationships

A business based in Eastern Europe with annual turnover of around €45 M designs, produces and installs facades for commercial and residential buildings. A large portion of its customers are UK and Scandinavian building contractors.

This company exclusively uses a bank headquartered in Scandinavia because its first export markets were Sweden and Norway. In the UK, it uses a branch of the same Scandinavian bank. It will cause significant disruption for the SME to build a new banking relationship in the UK if Brexit means they can no longer be serviced by the London branch of their Scandinavian bank. The company has no history with UK banks, and it anticipates the process of building a relationship with a second bank will cause administrative burdens that will distract valuable staff from day-to-day business.

SMEs need a Plan B for dealing with the disruption to their banking arrangements that might be caused by Brexit. But, lacking the spare staff capacity or financial sophistication, few have developed one. Approximately 55% said they had made no plans so far for Brexit, while only 27% had carried out some internal planning (including scenario planning and discussions) and only 18% had executed plans.

Figure 4: **The extent to which SMEs have planned for Brexit**



Source: BCG

Of the three broad segments we interviewed, SMEs are the most worried about adverse Brexit-related effects. They are least able to absorb additional costs or deal with accessibility issues. Given their size, they are most vulnerable to temporary shocks and they find it most difficult to create new banking relationships. They typically lack the resources to create a Plan B.

Large Corporates and Investors

Large corporates are concerned about Brexit for much the same reason that SMEs are – that it may harm their businesses directly. New trade barriers could reduce foreign demand for their goods or services and increase imported input costs, as the devaluation of Sterling already has for British firms. Some domestic businesses may benefit from reduced foreign competition, but the overall impact of increased tariffs is expected to be negative. New restrictions on immigration could simultaneously drive up the cost of labour or force operations to be shifted to where it is more readily available.

Anonymous

//
There could very well be problems with it [fundraising] should the UK withdraw from AIFMD… we will have to adjust how we fundraise
//

UK Insurer

//
The ability to grandfather contracts for the remainder of their lifetimes and run them off would be our number one priority
//

UK Insurer

//
A hard Brexit would remove our rights to continue supporting customers through passported branches, affecting a lot of existing customer contracts as well as our ability to write new ones
//

Case study 4: Loss of passporting will have a material effect on the financing arm of an automotive manufacturer

The financing arm of an automotive manufacturer relies on passporting to distribute financing solutions across the EU27 / UK border. The firm is devoting significant resources to exploring its post-Brexit options, and is doing so at the expense of executing other projects and developing new technology. In the long term, the company is concerned that this prioritisation of resources may result in its falling behind competitors

EU27 Corporate

//
I imagine that the English [UK-incorporated] banks will create a European subsidiary we will be able to deal with
//

Large UK Asset Manager / PE Fund

//
I find it inconceivable that those banks [hubbed in the UK] would not set up in Europe
//

Some large corporates have said that they are delaying or reconsidering investing in the UK because of uncertainties about tariffs and access to talent and finance post-Brexit. Pharmaceutical companies are concerned about the divergence of the UK and EU27 patent regimes, which could create a substantial administrative burden. Manufacturers are similarly worried about the divergence of manufacturing standards and duplication of compliance efforts. Retailers fear that inflation of import prices may compress already thin margins or require price increases that reduce sales.

Large investors, such as insurers and asset managers, identified many of the same issues. However, their primary concerns are specific to their industry.

The loss of "passporting" under the UCITS Directive and AIFMD could require investors to rely on many different national private placement regimes (NPPRs), creating costly frictions in their fundraising processes. Many investors told us that existing contracts must be "grandfathered" to avoid harm to their own businesses and to their clients.

UK insurers fear disruption not only to their investing activities but also to their underwriting businesses. Under a hard Brexit, UK insurers may lose the benefit of being able to passport under the Solvency II regime, removing their ability to write and distribute policies to EU27 customers on a cross-border or branch-basis. In which case they would need to create locally licensed subsidiaries in the EU27.

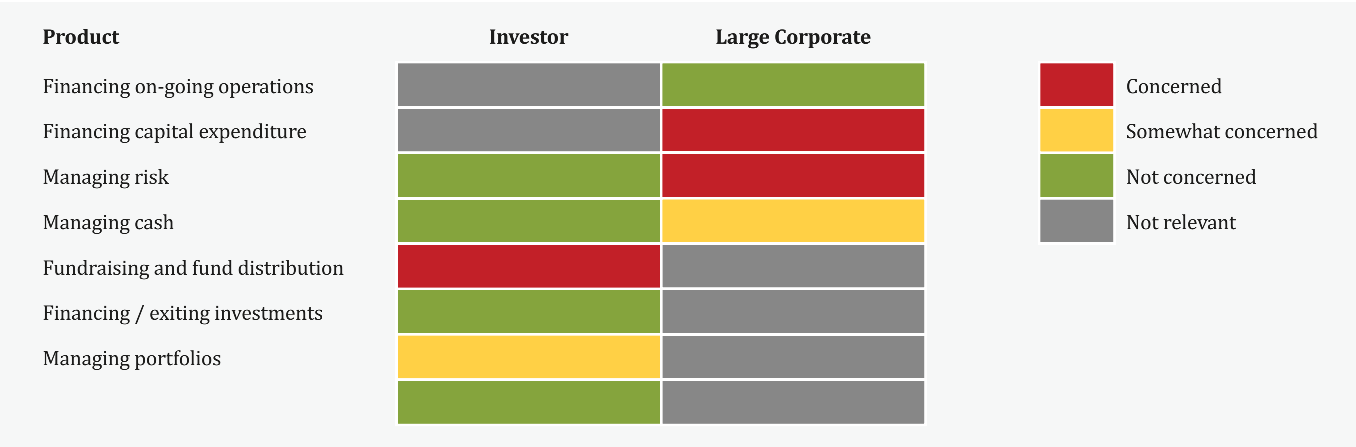
The loss of passporting is also a problem for some corporates, such as large auto and energy firms, that have financing arms licensed in the UK and engage from there in cross-border transactions with EU27 customers (see case study 4).

Large corporates or investors are less concerned about effects of Brexit that will be transmitted through wholesale banking. Approximately two-thirds of large corporates and more than three-quarters of investors interviewed have cross-border banking relationships. They believe that the cross-border business of UK banks into the EU27 is so large and well established that, denied passporting, banks would create subsidiaries rather than withdraw operations.

Most large corporates or investors believe that even if Brexit were to cause disruption in cross-border banking, they would be unaffected. They typically have multiple banking relationships and, being preferred clients, find switching easy. Their loan facilities are often underwritten by several banks and, when transacting in securities or derivatives, they have a large panel of banks offering quotes and execution.

As with SMEs, large corporates and investors are concerned about some financial products more than others, depending on how important they are to their business and on where they believe disruption might occur (Figure 5). Long term financing, risk management and fundraising are their main concerns.

Figure 5: **Concern about the effect of Brexit on wholesale banking services, by product area**



Source: BCG

Large corporates and investors acknowledge that Brexit may reduce the number of banks operating in any market and that this could affect **access to finance** and its pricing. As mentioned, however, each believes that they will not be among those affected.

Cash pooling is another matter. Some corporate treasurers fear that Brexit could make it more difficult to pool accounts across the UK/EU27 border, thereby increasing the cost of liquidity management (see case study 5). Some are withdrawing business to their own side of the new border.

Trade finance is perceived to be a lesser concern. While most interviewees agree that trade may be negatively affected, they believe that when it comes to trade finance, banks could easily maintain the status quo. However, many interviewees were unaware that banks may need to re-arrange their operations to continue providing the infrastructure that makes trade finance possible across multiple geographies in a seamless fashion. For many banks, it could require subsidiarisation and a significant movement of operations and back office staff.

Anonymous
//
We have moved our cash pool out of the UK [as a result of Brexit]
//

Case study 5: EU corporate concerned about less efficient netting of accounts

A EU27 power utility company operates in 3 core areas (renewables, retail and grid & infrastructure) and conducts business across multiple European countries, including the UK. The company pools its cash across its EU27 and UK accounts, undertaking a daily sweep to net the interest income and interest expense associated with these accounts. The company is concerned that, post-Brexit, they will be unable to pool their cash across the border, leading to less efficient netting. The possibility of fees or taxes associated with cross-border cash pooling would also hinder the integration of their cash management across Europe.

EU27 Corporate

//
When we book build, we mostly deal with DCM desks in the UK. We would like to continue to deal with these UK entities post-Brexit, but are concerned we will not be able to do so
//

Anonymous

//
We are concerned we will no longer able to issue euro-denominated debt via a UK banking entity; having to use a European bank based in Europe would create a lot of added complexity and additional cost
//

UK Corporate

//
The EIB is our single biggest lender for capital investment. We will have to become more reliant on debt capital markets to replace this well-established source of funding, particularly for infrastructure projects
//

Access to capital markets post-Brexit is a concern for some companies that rely on cross-border relationships with UK-incorporated banks. Others have fears surrounding their ability to raise funds via cross-border debt issuance (see case study 6) or that fragmentation will cause secondary market liquidity to decline, especially in debt capital markets.

Other corporates are unconcerned by changes in capital markets post-Brexit, being confident that they could still tap different markets via multiple banks or by shifting instruments. For example, if their EU27 bank is prevented from providing access to UK investors, they believe they could create a syndicate of EU27, UK and US banks to give them access to a suitable investor base.

UK corporates who rely on some degree of **funding from European supra-national bodies,** such as the European Investment Bank (EIB) and European Investment Fund (EIF), fear they will have to turn to other, more expensive sources.

A significant proportion of our interviewees are concerned about **risk management**, especially those in industries that rely on long-dated derivatives for this purpose. Brexit could fragment the derivatives and currency markets, reducing liquidity and netting benefits, thereby increasing the cost of risk management.

EU27 Corporate

//
The main [Brexit-related] impact for us will be on derivatives. If the price of hedging becomes too expensive, continuing to hedge [our exposure] may be a challenge. But this would be very risky; for now we would prefer to continue hedging, even if the cost goes up a little
//

UK Corporate

//
Accessing hedging products may become a real minefield to try to navigate. This may influence our funding decisions.
//

Case study 6: Securitisation concerns for EU27 Automotive Manufacturer

The financing arm of an automotive manufacturer sells its financial services to EU customers under the passporting regime. Selling asset backed securities (ABS) to investors in the UK and EU27 accounts for around 30% of the company's funding. Securitization is done out of the UK under English law, However, many of these securitization transfers involve German assets, making this a cross-border process.

The firm is concerned about the uncertain outcome of current EU proposals for reforming securitization regulations. Given the importance of cross-border securitization to their business, they are vulnerable to new constraints on the market post-Brexit.

The need to re-write contracts is another concern for some of our interviewees. Consider, for example, an EU27 based asset management firm that engages with London-hubbed banks for securities and derivatives transactions. Post-Brexit, it may need to re-write its contracts with its banking partners. The administrative burden is likely to be significant, adding to the other legal and contract re-documentation processes that many asset managers are already going through (see Box 1). Large firms may, to some extent, be able to absorb the cost and handle the burden given their sophisticated legal and finance departments. For smaller firms, however, the burden could be material. With constrained internal legal resources, many will need to outsource the task to third party lawyers, who typically have a limited knowledge of their business, which increases the time the process takes, its cost and its operational risk.

EU27 Corporate

//
If we have to trade with EU entities [for interest rate swaps] then will have to renegotiate the ISDA that we have in place. This will be very cumbersome for us
//

EU28 Investor Association

//
There is going to be a lot of re-papering… for some firms it will be under control but it will be a lot of work in certain cases
//

Box 1: **Contract re-documentation exercise to comply with new OTC derivatives regulation**

To promote derivatives trading through exchanges and central clearing, BCBS and IOSCO have mandated new margin requirements for over-the-counter (OTC) transactions. Financial counterparties and counterparties with exposures exceeding specified clearing limits are required to exchange collateral (margin).

Complying with these new rules has required banks and their clients to undergo a substantial re-documentation exercise for all their OTC derivatives transactions. The magnitude of the task is such that it exceeds the in-house legal and administrative capacity of many banks' clients. Third-party legal firms have then been hired to do the work. This is not only expensive but introduces delays and complexity into the process.

The EU had specified March 2017 as a deadline for compliance; the majority of firms did not meet it. Recognising the scale and complexity of the task, regulators have decided to show forbearance until September 2017.

If wholesale banking services become more expensive as a result of Brexit, the knock-on effects will depend on the market position of the corporate customers. Those with competitors who will not face the same increases in the cost of credit, derivatives and other wholesale banking services – perhaps because they have lower gearing or less need of hedging – may find it difficult to pass the extra costs to customers and will need to absorb them though reduced profit (see case study 7). If the effects are felt more uniformly across an industry, as with large investors, costs are likely to be passed to customers. But, even then, the firms may lose out; higher consumer prices could reduce demand.

Case study 7: EU27 Corporate may be materially affected by increase in price of wholesale banking services

An EU27 corporate with annual turnover of around €4 billion has operations in the UK accounting for approximately a third of total revenues.

The company finances its short-term operations through a revolving credit facility. For the financing of its long-term operations, the parent company issues bonds in Europe and then down-streams these funds to local operations. Interest rate and commodities (mainly fuel) hedging is also important for the business.

The company operates with low margins because the industry is very competitive. Asset depreciation is a significant proportion of total costs, and contracts are regularly renewed. Of its UK contracts, between 10% and 20% are renewed each year. Any increase in the cost of debt funding and derivatives would therefore have a material impact on the business, making it less competitive and squeezing already low margins.

EU27 Corporate

//
[re-pricing] will clearly have a massive impact as we are a low margin business
//

Financing Arm of EU27 Auto Manufacturer

//
Any increase in borrowing costs we will pass through to customers… this means it will become more expensive to buy our products … the impact is that we will sell fewer products and this ultimately comes back to the real economy as it means there are fewer products coming out of plants and fewer people needed to build those products.
//

Can Clients' Expectations Be Fulfilled?

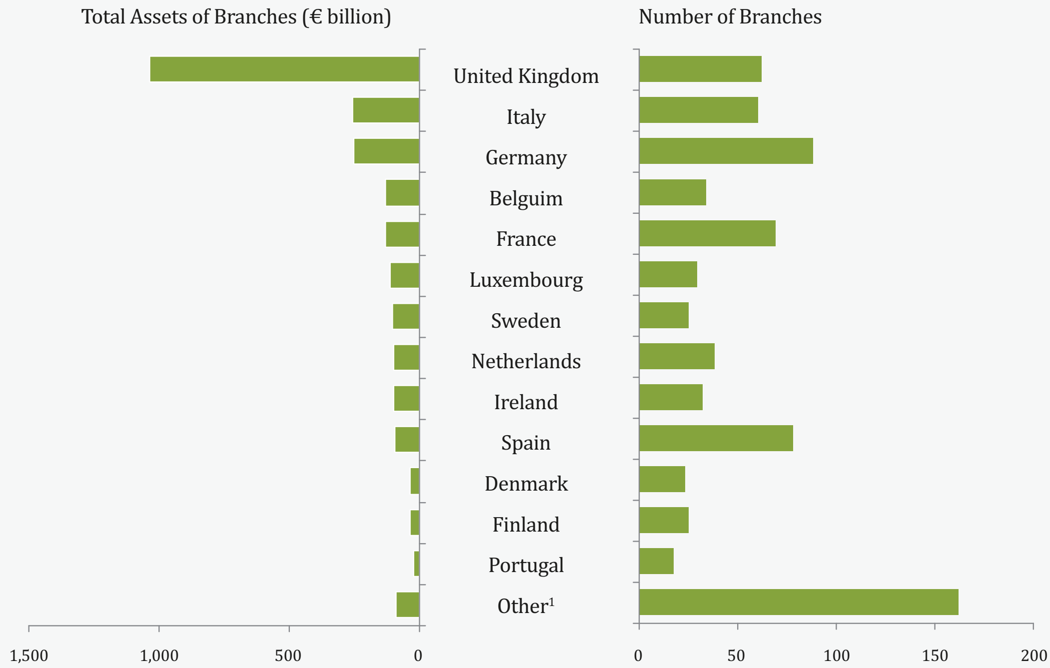
Quantifying the impact of Brexit on lending, trading and clearing

Can Clients' Expectations Be Fulfilled?

As noted in the previous section, wholesale banking clients expect their banks to support them as they navigate Brexit rather than adding to the difficulties. Can these expectations be fulfilled? And what will it take from an operational, regulatory and commercial standpoint? These are the issues we examine in this section.

The "passporting" established under CRD IV and MiFID allows a bank licensed in any EU country to operate in any other by establishing branches or providing services cross-border. Since its introduction, many banks have used passporting to expand their business across the EU while keeping their capital and most administrative functions in their home countries (Figure 6).

Figure 6: **Non-domestic bank presence in EU28 countries**



Other includes: Czech Republic, Austria, Slovakia, Romania, Poland, Hungary, Estonia, Greece, Lithuania, Latvia, Bulgaria, Slovenia, Cyprus, Malta, Croatia

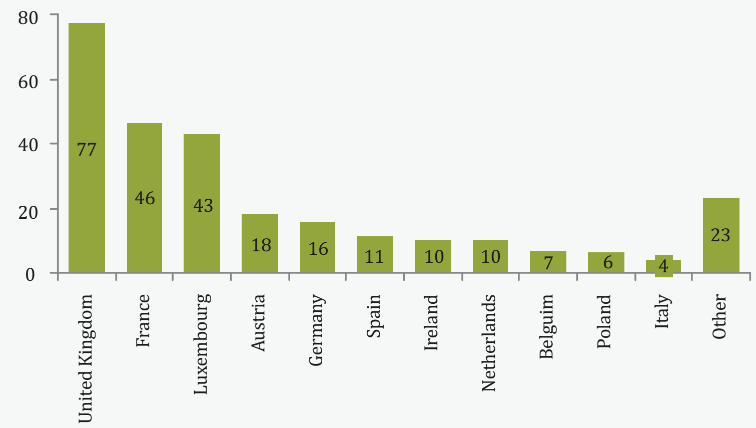
Source: EBA statistics 2017

UK to EU27: A hard Brexit would end passporting between EU27 countries and the UK. In the absence of any replacement arrangements that allow similar levels of access, a UK bank that wants to continue (or start) operating in EU27 countries may need to create a subsidiary in an EU27 country, with a banking licence obtained from that nation's regulator or the European Central Bank for Eurozone bank licences. The UK plays host to a large number of global (parented outside the UK or EU27) bank subsidiaries (Figure 7), many of which operate across the EU27 on the basis of a UK banking licence. They too will probably need to create an EU27 subsidiary if they wish to continue trading with EU27 clients.

EU27 to UK: Brexit is likely to have a smaller impact on EU27 banks providing services into the UK because the UK has generally had a relatively open approach towards inward business from non-UK banks.[11] This applies both to conducting cross-border business with larger UK-based companies and institutional investors, and to operating through branches in the UK (provided they do not serve retail and smaller corporate clients). *For the purposes of our analysis, we have assumed that cross-border and branch-based banking from EU27 banks to UK clients, whether lending or trading, will continue as is (see sidebar).*

Some EU27 banks may have to reappraise their business in the UK. This might be because the profile of their branches' activities means they are required to subsidiarise some of their UK operations (e.g. serving retail customers). Or they may rely on passporting to service clients in EU27 countries from a UK branch, which may become impossible after Brexit. Given its relative insignificance, however, we do not account for any such reduction in cross-border business in our analyses.

Figure 7: **Non-EU banks with EU subsidiaries, by country**



Other includes: Bulgaria, Czech Republic, Croatia, Cyprus, Lithuania, Hungary, Malta, Portugal, Romania, Sweden, Denmark, Greece, Slovenia, Slovakia, Finland

Source: EBA statistics 2017

Estimating the Impact: Facts and Figures

We examine the impact of a hard Brexit on the provision of wholesale banking services from the UK to EU27, looking at four areas:

- Lending to EU27 clients (banking book)
- Trading activity with EU27 clients (trading book)
- Clearing
- Structural change

We then take a broader view of what Brexit means for the European banking system, including the UK.

11 UK legislation does not regulate corporate lending or restrict non-EU firms providing cross-border securities and derivative trading services to larger corporates and investors (under the "overseas persons" exclusion under the Financial Services and Markets Act). In addition, the UK PRA allows appropriately regulated non-EU banks to maintain UK branches focused on wholesale banking, at least unless interruption of branch services would cause financial instability in the UK (PRA Supervisory Statement SS10/14).

Looking at credit flowing in the other direction, we estimate the total lending of EU27-incorporated banks to UK clients to be €140 billion. This lending is supported by about €24 billion of equity capital currently domiciled in the EU27.

This ratio of equity capital to loans is significantly higher than the ratio for lending that goes from the UK to the EU27, where €180 billion of loans is backed by €13 billion of equity capital. This difference may be explained by greater use of the internal ratings-based (IRB) approach by UK-based banks than by EU27 banks (who more often mandated by their regulator to use the higher-capital standardised approach) and may also indicate differing levels of risk presented by borrowers.

Given that the UK is likely to remain more open to inward business from non-UK banks, we believe lending from EU27-incorporated banks to UK clients faces relatively little Brexit-related disruption.

Lending (banking book)

We estimate the total loans outstanding of UK-incorporated banks to EU27 clients to be €180 billion. This lending is supported by about €13 billion of equity capital and €167 billion of debt capital (or "funding") currently domiciled in the UK (see Box 2: Note on methodology). A hard Brexit may cause some UK-incorporated banks to withdraw from lending to clients in the EU27, reducing aggregate lending capacity there (though this capacity may be restored if EU27 banks deploy more capital in their home countries to plug the gap).

Some large corporates would probably be insulated from any reduction in capacity. Their relatively low risk profiles coupled with the cross-selling opportunities they present to other parts of the bank – such as investment banking – makes them an attractive client segment. Riskier segments, such as SMEs, are more likely to bear the brunt of any negative effect. Should the loss of this €180 billion cross-border loan exposure fall entirely on EU27 SMEs, we estimate this would represent about 7% of EU27 SME loans outstanding.

Assuming that the existing business of UK-incorporated banks withdrawing from the EU27 is grandfathered, the full effect would take several years to appear as loan portfolios run off. The immediate effect of this reduction in capacity would be felt by EU27 companies looking to obtain new loans.

Securities and Derivatives Trading (trading book)

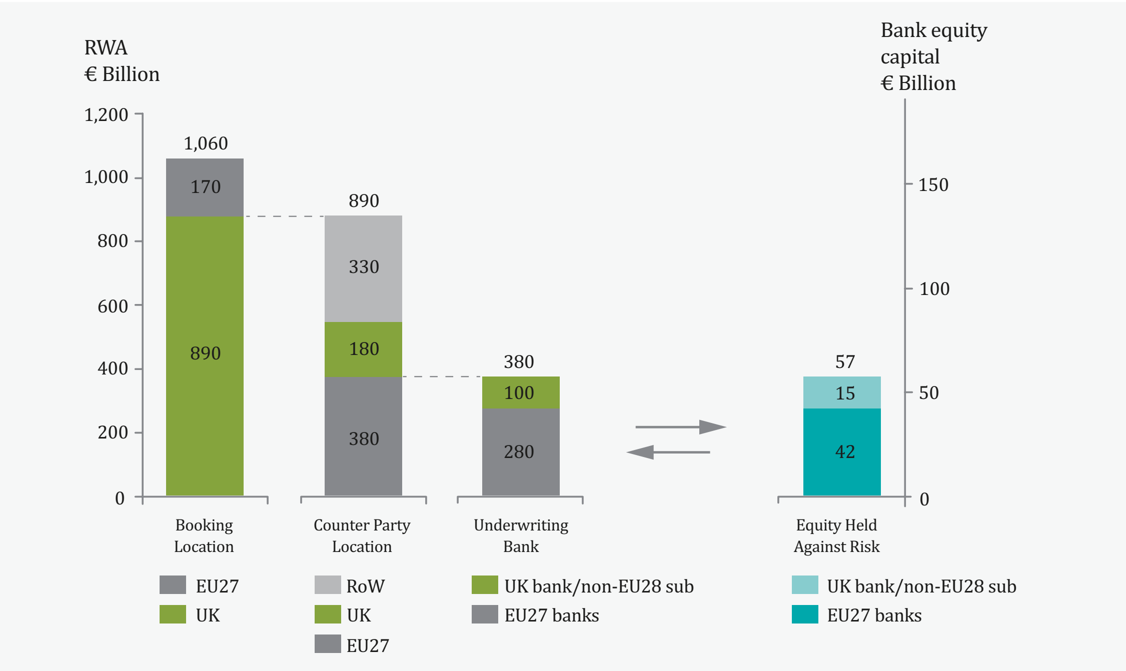
EU27 businesses often enter into securities or derivatives transactions ("trades") with UK-based banks, including the UK subsidiaries of non-EU28 banks and the UK subsidiaries and branches of EU27 banks. Banks must hold capital as a buffer against the market and credit risk created by these trades. With the loss of passporting, UK-based banks are likely to move a significant part of these trading activities to EU27 entities, with sufficient capital to meet the regulatory requirements.

The overall trading-related risk exposure currently booked by UK-based banks stands at approximately €890 billion.[12] A significant portion of this – approximately 43% or €380 billion, supported by €57 billion of equity capital and €1,040 billion of funding – arises from transactions with EU27 clients, and puts an upper bound on the magnitude of business that would need to be rebooked from the UK into the EU27. In terms of bank assets, the €380 billion RWA exposure represents approximately €490 billion of securities and €610 billion of derivatives.

12 Measured by risk-weighted assets (RWA)

Some of this business may not need to be rebooked. If grandfathering is permitted, it will be possible to maintain some large contracts until run-off; or rebooking may not be required in some countries because of local exemptions; and there may be other risk transfer mechanisms which reduce capital costs. Nevertheless, the proportion of this €380 billion RWA exposure that would need to be re-booked to the EU27 following Brexit is likely to be significant. Banks dealing with EU27 clients from London would need to shift not only the required capital, but also many of the operations, depending on the extent of outsourcing that local EU27 jurisdictions permit.

Figure 8: **Breakdown of trading RWAs by booking location, counterparty and underwriting bank**

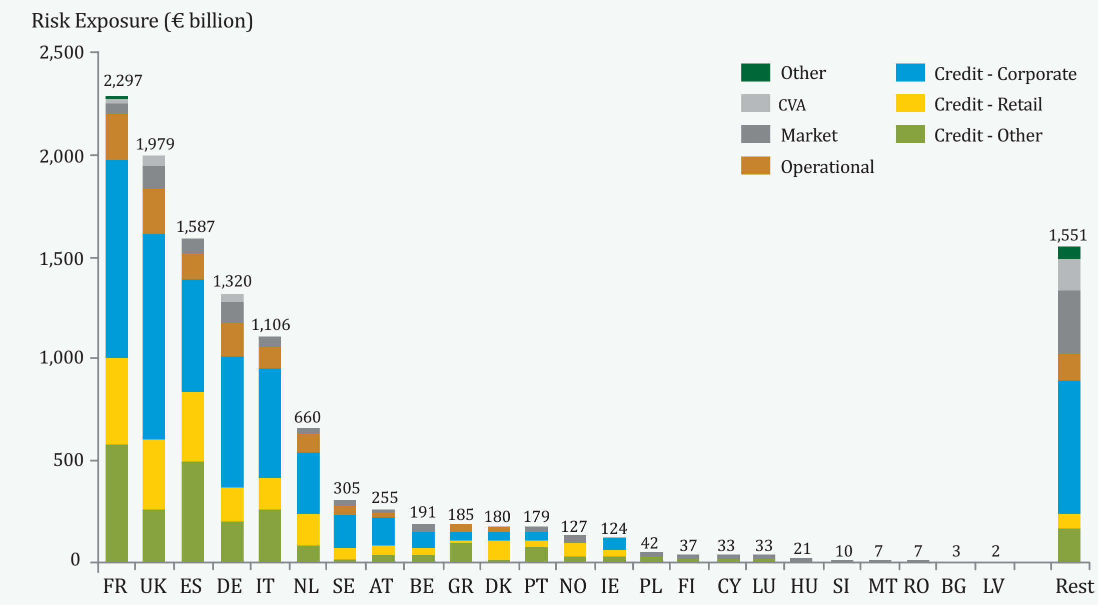


Source: EBA, BCG analysis

Box 2: **Note on methodology**

The key input into our lending and trading analysis is risk-weighted asset (RWA) data available from the EBA.[13] Figure 9 shows the aggregated risk-weighted assets held in the EU28 by risk type.

Figure 9: **Aggregated risk-weighted assets by bank HQ location and by risk type**



Note: Rest primarily consists of non-EU28 bank subsidiaries

For the purposes of our banking book analysis, we use corporate credit risk RWA as a measure of loan exposures to corporates and SMEs. The EBA provides data about the location of the lending bank – UK, EU27 or non-EU28 subsidiary - and of the borrower. This allows us to isolate how much RWA exposure to EU27 clients originates from UK-based banks. To this we apply average Tier 1 ratios to derive equity capital.

For the purposes of our trading book analysis, we use the sum of market risk and credit valuation adjustment (CVA) RWA to represent trading-related exposures, to which we apply a Tier 1 ratio to arrive at equity capital. However, market risk and CVA RWA data do not include the location of the counterparty. We therefore use the counterparty view given by credit risk (ex. retail) as a proxy. Finally, since we know a large portion of exposure of EU27 banks to EU27 clients is booked in London, we use trading volume data from the Bank of International Settlements to estimate what proportion of RWA is booked in the UK compared to the EU27.

The above methodology results in our estimate of banking book and trading book equity capital which is held in the UK and supports EU27 clients, and which would need to relocate following a hard Brexit. Any such fragmentation will invariably give rise to long-term capital inefficiencies due to a loss of netting benefits, less portfolio diversification, additional capital buffers and greater operational risk. The magnitude of this capital inefficiency will vary from bank to bank, and will depend on internal pricing models, portfolio compositions, current scale and complexity, and many other factors.

13 https://www.eba.europa.eu/risk-analysis-and-data/eu-wide-transparency-exercise/2016/results

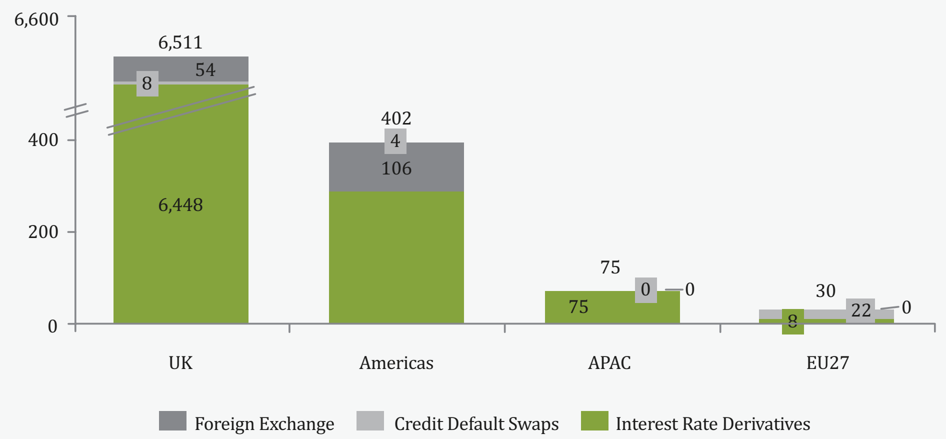
Clearing: segregation of Euro-denominated contracts

Some EU political leaders have called for all euro-denominated contracts to be cleared in the Eurozone. If made law, this would separate euro-denominated contracts from non-euro contracts held at Central Counterparties (CCPs) located in the UK and, possibly, at CCPs in other non-EU locations.

At present, members of clearing institutions can offset positions in one currency against positions in other currencies, which produces significant netting benefits, such as reducing the amount of collateral that must be posted to the clearers. This benefits both the banks who are members of the clearing institutions and their end user clients, with whom the banks have risk positions created for hedging or other purposes. Management of risk in this fashion also serves to reduce systemic risk.

The UK's LCH SwapClear is a major global clearer of interest rate derivatives, in euros and seventeen other currencies. If euro clearing were moved to a country within the EU27, the efficiency of offsetting all currencies in a single centre would be significantly reduced. Aggregate transaction costs would rise unless an EU27 CCP can accept all open positions and contracts in multiple currencies.

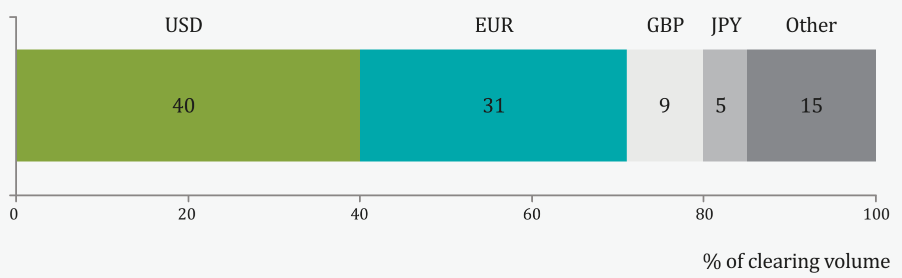
Figure 10: **OTC clearing volumes by location of CCP and by contract type (€ billion)**



Note: Amounts correspond with cumulative clearing volume in first week of May 2017

Source: Clarus, LCH , Eurex, CME, ICE, BCG analysis

Figure 11: **Global Interest Rate Derivatives clearing activity by currency**



Note: Amounts correspond with cumulative clearing volume in first week of May 2017

Source: Clarus, LCH , Eurex, CME, ICE, BCG analysis

We estimate that moving the approximately €83 trillion notional outstanding of euro-denominated interest rate contracts out of the UK to the EU27 would impose an additional collateral requirement on the European banking sector – in the form of initial margin - of approximately €30-40 billion, an increase of 40-50%. Banks and other financial counterparties would have to fund this with high quality collateral that is already scarce. We also estimate that clearing members would need to post an additional €3-4 billion in default fund contributions (a 20-30% increase), to cover any losses that may not be met by initial margin contributions and CCP own funds.

Shifting euro-denominated interest rate derivatives clearing into the EU27 would require banks to hold an additional €1 billion of equity capital,[14] though this figure could be much higher if there are material losses in compression benefits.

Clearing: loss of equivalence for UK CCPs

Regardless of whether EU legislation continues to allow UK CCPs to clear EUR-denominated contracts, UK CCPs losing their status as CCPs authorised in the EU would raise a number of issues. Unless UK CCPs are recognised under EU legislation on the basis of an "equivalence" determination by the European Commission, positions held by EU27 banks in UK CCPs would be subject to a roughly 50 times increase in required equity capital because the risk weights for the positions would increase from around 2% to 100%.

EU legislation would also prohibit UK CCPs from continuing to provide clearing services to EU27 banks that are clearing members. EU27 banks and other counterparties would no longer be able to use UK CCPs to clear OTC derivatives that are subject to the clearing obligation in the EU (including for trades with UK banks or other UK counterparties). Although this scenario is unlikely to arise due to its severe implications for financial stability, and is not quantified in this report, it is worth noting that we feel this is the worst-case hard Brexit scenario for UK CCPs.

Structural change

A hard Brexit would be likely to impose material restructuring costs on banks. They would need to create new legal entities, re-write customer and supplier contracts, and build new technology platforms, risk management systems and compliance processes. They would also need to hire new staff in the EU27 and shed staff in the UK, both of which are costly processes.

To estimate the cost, we looked at previous structural change efforts by banks: specifically, the publicly stated cost estimates of Barclays, HSBC and Lloyds for structural change, such as UK ring-fencing and the US requirements for them to establish intermediate holding companies for their US operations. We scale the sum of these costs by the equity of the 14 EU27, UK and non-EU28 banks we envision being most affected by Brexit. Because these proxy structural changes concerned primarily back and middle office functions, we scale-up again to account for the fact that hard Brexit structural changes would also affect front office functions.

This approach gives us an estimated cost of the required structural change of €15 billion. Amortised over three to five years, this could reduce return on equity for the banks affected by 0.5 to 0.8 percentage points. The actual cost would vary substantially from bank to bank, and would depend on the bank's existing EU27 footprint and client focus.

14 Calculated using the Basel Standardised Approach to Counterparty Credit Risk (SA-CCR, 2014)

Summary

Clients generally expect banks to continue providing the same level of service after a hard Brexit. This could be achieved, however, only if banks incur additional operational and capital costs.

Large quantities of bank capital would need to be transferred to EU27 legal entities. We estimate the total to be €70 billion of equity capital (or €140 billion of total regulatory capital, taking into account Tier 2, TLAC debt and buffers) and €1,207 billion of funding, assuming all stock is re-booked. Most would be due to the migration of trading activity (€57 billion of equity capital and €1,040 billion of funding), with the remainder to support the banking book (€13 billion of equity capital and €167 billion of funding).

As these businesses were built up in EU27 locations, banks would continue with their UK operations and there would be some temporary duplication of capital. For example, any newly created EU27 entities would need to be suitability capitalised before migration began and some sources of funding, such as deposits, may be geographically "sticky". Certain transitional risk-transfer mechanisms could also give rise to capital duplication, relating to inter-company transactions.

Nor would banks' increased capital requirement be merely temporary. Centralised "capital pots" must be divided, giving rise to inefficiencies in the form of reduced netting and diversification benefits, additional capital buffers and greater operational risk. These inefficiencies would affect both existing UK entities and new EU27 entities, and we expect the additional equity capital requirement to compensate for these factors to be about €20 billion (€2 billion from banking book fragmentation and €18 billion from trading book fragmentation). The total regulatory capital requirement could double this figure to €40 billion. Because these increased capital requirements would be concentrated on a subset of banks – those serving EU27 clients on a cross-border basis or through branches – the impact could be material for them.

Besides these additional capital requirements, there would be material restructuring costs. Creating a new legal entity, migrating clients and re-writing contracts would entail significant legal and administrative costs, especially considering that many banks would be going through the process at the same time.

The migrated business would also require new infrastructure and operations: IT, treasury, compliance, risk management and front office operations. In most cases, these will be subscale versions of operations previously centralised in London, increasing unit costs and creating duplication. And staffing these new EU27 operations will require either relocations or local recruitment, both of which are costly and increase operational risk.

Based on the previous restructuring efforts of banks, we estimate a total restructuring cost of €15 billion. Amortised over 3 to 5 years, we estimate that this has the potential to reduce return on equity for affected banks by 0.5 to 0.8 percentage points during the amortisation period. The actual cost each bank incurs would depend on existing EU27 footprint and client focus.

Such a large-scale geographic shift in trading and clearing has not previously been undertaken, however, and these estimates are unavoidably uncertain.

The Brexit-related relocation of capital...

Banking Book

€180 bn
of loans outstanding from UK-incorporated banks are to EU27 corporates & SMEs

which represents...

4%
of loans outstanding to EU27 corporates & SMEs

and is supported by...

€13 bn
of bank equity capital which may **need to be transferred**

Trading Book

€380 bn
of trading RWAS booked in the UK support EU27 clients

which represents...

68%
of UK-booked trading RWAs to EU28 clients

and is supported by...

€57 bn
of bank equity capital which may **need to be transferred**

€1,100 bn
of trading assets booked in the UK support EU27 clients

of which...

€610 bn
are derivative products

and...

€490 bn
are securities

Which could require...

The **€70 bn** of equity capital (€140 bn of total regulatory capital) that may **need to be transferred** represents...

~9%
of impacted bank equity capital

Movement of this capital could involve...

€15 bn
of structural change costs

and a **0.5-0.8 ppt** **reduction** on bank RoE

and could give rise to **long-term capital inefficiencies** amounting to

~€20 bn
additional equity capital required
(€40 billion of total regulatory capital)

Additionally, for cleared products...

Currently booked in the UK, there is...

€83 tr
of €-denominated cleared swaps

or...

33%
of notional across all currencies

Migration of this volume from the UK to the EU27 could result in...

€30 - 40 bn
of additional initial margin which represents a
40 - 50% increase

and...

€3 - 4 bn
of additional default fund contribution which represents a
20 - 30% increase

Conclusion

Implications and call to action

Conclusion

Our interviewees believe that a hard Brexit poses risks for their businesses, especially small firms with customers or suppliers cross-border. Trade tariffs, regulatory divergence and restricted labour mobility could materially increase their costs.

On top of all this, they face potential disruption in the provision of wholesale banking services. Some banks are likely to subsidiarise to maintain cross-border operations, but doing so may increase their operating costs. Others may choose to withdraw to their home market, reducing the supply of wholesale banking services in the EU27. Businesses may feel the effects of a hard Brexit through more restricted access to wholesale banking services or higher prices.

In other words, SMEs, corporates and investors may face a higher cost of capital – not only directly, through the increased cost of bank lending or of raising capital in the debt and equity markets, but indirectly, through the increased cost of risk hedging products. Since cash flow volatility is a determinant of the cost of capital, so is the use of these products. Whether firms respond to derivatives price rises by paying more for them or by accepting greater volatility, their cost of capital is increased.

Ultimately, the potentially increased cost of capital caused by a hard Brexit would make marginal investments unprofitable and they may not occur. As noted, SMEs are likely to be hardest hit by higher costs or restricted access to wholesale banking services following Brexit.

If a hard Brexit scenario does occur, our interviewees and our “supply side” analysis suggests some recommendations for policy -makers:

- **“Grandfather” existing cross-border contracts.** Permitting existing contracts to run off under their pre-Brexit terms is critical to minimising the legal and operational disruption to banks and their clients.

- **Provide regulatory support and sufficient time.** Forming new legal entities and re-documenting client relationships are labour intensive and time consuming. Giving firms adequate time to complete these tasks will help to minimise disruption to on-going business operations.

- **Allow transitional arrangements.** Temporarily allow risk-transfer between the EU27 and UK. Capital covering EU27 risks should be allowed to remain in London until the banks build up the required capability – risk management functions, compliance processes etc. – in local EU27 jurisdictions.

- **Fill gaps.** UK policy makers should establish alternative funding schemes to substitute for the loss of funding options that UK companies will face from no longer having access to the European Investment Fund (EIF) and the European Investment Bank (EIB).

Besides such specific policy recommendations, interviewees all seek clarity. Many businesses feel they cannot sensibly make post-Brexit plans without knowing the “deal”.

Above all, businesses want the status quo preserved. Of those who commented, approximately 80% of our interview participants – EU27 and UK – hope Brexit negotiations will result in no material change in their access to wholesale banking services or to the price of them. Interviewees feel strongly that the political negotiations should keep in mind the impact of Brexit on real economy end users.

Appendix

Appendix

Hard Brexit definition

The interviews and analysis described in this report assume a "hard Brexit". This is a potentially vague expression, which we therefore defined by the following conditions:

- **Trade** The UK is no longer part of the European single market and customs union, and cannot continue to trade with non-EU countries under EU trade agreements. The UK will need to negotiate new trade agreements.

- **Passporting rights and "equivalence"** UK banks, insurers and asset managers will be unable to operate in the EU27 under the passporting regimes. Nor will equivalence be established. These firms will therefore lose their right to sell their services freely across the EU27 unless they already have or create a legal entity within the EU27. UK banks may be able to establish branches in EU27 jurisdictions to serve clients in that country. They will not, however, be able to serve clients throughout the EU27 from this branch.

- **Workforce mobility** Free movement of people between the EU27 and the UK ends. The UK designs its own immigration rules.

- **Regulatory environment** The UK need no longer adhere to EU regulations and is free to set its own regulations across industries, such as insurance (Solvency II), financial markets (MiFiD), M&A, healthcare, farming, energy and data protection.

- **Government and Central Bank Funding** UK-based banks lose access to ECB funding facilities. UK firms lose access to funding from European Investment Bank and European Investment Fund.

To ensure interviewees were aware of these assumptions, they were clearly stated in the questionnaires and in case studies developed by the project working groups.

Overview of methodology for clearing analysis

Step	Summary	Assumptions	Source
A. Preparation and transformation of underlying clearing data			
1.	Collected CCP-related and clearing data directly from LCH SwapClear and Bloomberg: a. Notional outstanding of interest rate derivatives by tenor and currency, size and composition of default fund and contributions, compression rates, underlying curve (i.e. Euribor) data b. CPMI-IOSCO Quantitative Disclosures		LCH SwapClear Bloomberg
2.	Created a new weighting scheme of notional outstanding by factoring for tenor and risk, as measured by volatility: a. Across major currencies, calculated (notional outstanding in base currency * tenor * curve volatility)	Purpose of re-weighting is to gain a more accurate reflection for amount of initial margin that is based on EUR-denominated trades by capturing underlying economic drives	BCG analysis
B. Impact of Initial Margin			
3.	Applied new weighting scheme to total initial margin to deduce amount driven by EUR-denominated clearing (pre-Brexit initial margin)		BCG analysis
4.	Created series of tests to deduce likely impact of carving out and reconsolidating EUR-denominated clearing from UK CCP to Europe: a. Modelled volatility and VaR of a pre-Brexit equally balanced portfolio of 3 major curves (USD, GBP, EUR) against the post-Brexit portfolio of concentrated Euribor holdings b. Leveraged IRS margin calculators to model impact on initial margin given removal of EUR-denominated trades on a pure valuation basis c. Validated results through use of IRS delta ladders (delta sensitivity analysis)	Dynamic variables such as volatility, correlation, NPV, and VaR are key inputs into Initial Margin computation Anticipate IM should roughly double as spread risk is replaced by outright risk on the EUR portfolio No call made on existing activity in prospective EU CCP, or counter-impact on UK CCP	BCG analysis Bloomberg LCH SwapClear CME CORE Clarus
5.	Triangulated final impact based on preceding tests		
C. Impact of Default Fund Contributions			
6.	Starting with total disclosed default fund contributions across the entire CCP, created allocation for amount associated with derivatives based on LSE disclosures		LSE LCH SwapClear
7.	With total derivative-based default fund contributions, applied the same weighting scheme as calculated for initial margin in step 2 to estimate amount of derivative contributions associated with EUR-denominated clearing		BCG analysis
8.	Applied linear shift in default fund contribution impact as observed with initial margin: a. Constant "spread" between initial margin and default fund contributions (based on worst-case loss scenario)	Shift is justified by fact that initial margin and default fund contribution requirements are estimated under similar approaches (HVaR) but under more severe scenarios / losses	BCG analysis

Step	Summary	Assumptions	Source
D. Analysis of clearing impact on bank equity capital requirements			
9.	Created a comprehensive Basel-based SA-CCR capital requirements model for capturing and calculating capital implications of clearing analysis	Included only relevant variables and inputs, excludes attributes related to other asset classes or products	Basel III BIS BCG analysis
10.	For analysis on initial margin and compression rates, calculated Exposure at Default a. Calculated EAD by changing initial margin values while keeping other variables constant b. Compression rate assumed to have no impact hence trade notional in pre and post-Brexit retained the same values	Compression scenario follows step 9 logic Large number of variables held constant or zero for purposes of analysing impact of focused changes	
11.	For analysis on default fund contributions, calculated hypothetical capital requirement of the CCP a. Capital requirement measured with hypothetical contributions by *i* member b. Calculated implied capital requirement (member capital / member contributions) to the entire market (* all member contribution)	With exception of member contribution(s), all other variables and inputs are provided directly through CCP disclosures	Basel III BIS LCH SwapClear CPMI-IOSCO Quantitative Disclosures
12.	Aggregated total post-Brexit capital requirements across EAD (initial margin, compression) and hypothetical capital of CCP (default fund contributions) to estimate total impact of Brexit on EUR-denominated clearing		

- Rather than list all assumptions, important to note that there are a number of baseline (e.g. all house clearing, no add-on client risk factors) and input-level (e.g. no change in economic position or MtM position) assumptions used to simplify the analysis
- Equity capital sizing and impact is implied and specific to EUR-denominated clearing. Including other variables (noted earlier) will move these values up and down. For example, the additional add-on risk-factors, variation margin, and independent collateral amounts posting will drive both collateral and equity capital higher, while out-the-money MtM and higher hedging offsets will drive collateral and equity capital even lower
- The analysis utilises a flat view of scheduled inputs by Basel, including risk weight (2%) and capital ratio (8%). In reality, these will likely vary with each clearing member
- Analysis does not actively model changes in qualifying status of either the UK or the prospective EU-based CCP, assumed explicitly and implicitly in both cases that will continue to be QCCPs

Glossary

ABS (Asset-Backed Securities) A financial instrument which has its value derived from and therefore backed by a certain pool of (generally illiquid) assets such as consumer loans, mortgages, etc.

AIFMD (Alternative Investment Fund Managers Directive) The harmonised EU28-wide regulatory framework for alternative investment fund managers (AIFMs). The directive allows for fundraising across the EU28 via a passport

Compression CCPs offer compression functionalities which allow members to terminate contracts and reduce gross notionals. A reduction in gross notional reduces Potential Future Exposure ("PFE") used in the leverage ratio capital calculation. Compression efficiency is a function of the amount of offsetting derivatives held in a single netting set and member participation to multilateral compression cycles. Fragmentation will decrease efficiencies due to a reduced capacity to manage multiple rounds of compressions across CCPs

Bank equity capital / equity capital Tier 1 equity capital

Cash pooling The process of aggregating the balances of several related bank accounts with the aims of optimising the net interest paid or received, and of improving cash management

Gearing The ratio of a company's loan capital (debt) to the value of its ordinary shares (equity)

ISDA Master Agreement The most commonly used master service agreement for OTC (over-the-counter) derivatives globally. As part of a framework of documents, it aims to fully and flexibility document OTC derivatives transactions

Large corporates For the purpose of this report, firms with annual turnover of more than €250 M were categorised as large corporates

National Private Placement Regime (NPPR) Allows alternative investment fund managers (AIFMs) to market alternative investment funds (AIFs) that otherwise cannot be marketed under the AIFMD domestic marketing or passporting regimes

Passporting regime Allows banks and financial services firms which are licensed in one EU28 or EEA jurisdiction to trade with minimal additional authorisation and regulation in any other EU28 or EEA jurisdiction

Risk-Weighted Asset (RWA) The assets or off-balance sheet exposures of a bank, adjusted by their risk to establish the potential exposure of a bank to losses

Small to Medium-Sized Enterprise (SME) For the purpose of this report, firms with annual turnover of less than €250 M were categorised as SMEs

UK-incorporated banks UK banks, UK-incorporated banking subsidiaries of EU27 and non-EU28 banks

UK-based banks UK banks, UK-incorporated banking subsidiaries of non-EU27 and non-EU28 banks, and UK branches of EU27 banks

Notes

Notes

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