

# The Economic Impact of the Deutsche Börse-NYSE Euronext Merger on the European Financial Markets

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# Executive Summary

This study examines the impact of the merger between Deutsche Börse Group (DBG) and the New York Stock Exchange Euronext (NYX) on the European financial markets. It takes the view that from a policy-making perspective **the impact of the merger on the European financial markets should be assessed beyond the mere realm of economies of scale, market share and competition**. The study therefore presents a broader framework, looking at (i) financial market stability and regulation, (ii) financial centre competitiveness, in particular of the euro area as a whole, and (iii) the inter-related goals of financial integration, cost-efficiency and harmonisation. The study comes to the following findings:

- Firstly, the study finds that the **DBG-NYX merger is consistent with and contributes to regulatory efforts towards enhancing European and transatlantic financial market stability**. The creation of an integrated, regulated trading and post-trading platform can provide an infrastructural response to the instability that has emerged from the financial markets in recent years, in particular in the OTC derivatives realm. In this context a strengthened transatlantic regulated exchange is desirable as it can extend the offer of central neutral risk management functions in addition to the more limited functions that are provided in an OTC context. These functions include liquidity and product standardisation, novation of contracts, active risk management, information provision and transparency, and the drawing on multiple 'lines of defence' (e.g. mandatory collateral, member guarantee funds, first-loss pools, capital calls on non-defaulting members, access to central bank liquidity and the CCP's own capital). As such, **the merger contributes to current regulatory efforts towards more financial stability through the strengthening of a regulated exchange that provides a strong, liquid CCP with risk management capabilities within the euro area jurisdiction, thus taking up a key goal of European policy makers (in particular the ECB) after the crisis**. With respect to the European and transatlantic regulation, this merged consolidated entity could provide the market side pre-requisites for regulators to build on in their cooperative efforts to reduce the risk of excessive regulatory arbitrage and avoid a 'race to the bottom' that could derive from an excessively competitive lowering of collateral thresholds and clearing fees and reduction of the layers of protection.
- Secondly, with respect to **financial integration, cost efficiency and harmonisation**, this study finds that the **creation of a large pan-European and transatlantic player with enhanced depth in trading and scale in clearing and settlement, can be expected to foster the much-needed consolidation of the European trading market**. It is also likely to generate additional benefits, particularly for cross-border trading, where costs are still higher than in the domestic arena. The consolidated merged entity also benefits from enhanced growth opportunities, creating a leading European derivatives player. **This will position Europe on level playing field with increasing global competition by other**

**global exchanges** such as BM&FBOVESPA, Korea Exchange and CME Group, which have already taken the lead in the equity, equity index and interest rate segments, and have achieved significant market shares. Analysis of comparable mergers also shows that such enhanced post-merger growth prospects do culminate in substantial high-value added employment increases, making the net effect much more positive than the short-term perspective would suggest. For example, CME Group, with its strongly growing derivatives business has seen a 10% staff increase in the past year alone, more than offsetting the staff reductions in the previous year. A strong presence in growth segments such as derivatives clearly translates into revenue growth and attendant employment growth.

- Thirdly, in terms of ***financial centre competitiveness***, **this study finds that European exchanges, and indirectly the financial centres they are embedded in, can be expected to benefit on the whole through an overall strengthened position in the global competitive environment.** The direct effect of the merger on the entity's exchanges and their indirect but still relevant effect on national financial centre competitiveness should be assessed against the expected competitive positions of national centres in the absence of the merger. The positive effects of the merger can be expected to predominate: the merged entity is likely to create a global brand and enable global market access centred around a variety of European exchanges. **A consolidated pan-European exchange entity can strengthen European financial centres as they have to position themselves in the strongly growing global derivatives market to offset likely losses in revenues in cash trading.** Other global exchanges such as BM&FBOVESPA, Korea Exchange and CME Group have already rapidly progressed in the equity, equity index and interest rate segments, and have achieved significant market shares. Providing a strong European player in these markets will benefit the new entity's various European exchanges, and indirectly the related financial centres in Europe, as they can advance their global positioning and brands in those asset classes and services, which are recording the fastest growth.

**Overall, the study mainly recommends that the process of developing a conclusive opinion on the DBG-NYX merger should be based on a careful evaluation of all three dimensions, in addition to the ongoing competition analysis** (which is not the subject of this study).

In light of this, the analysis presented here arrives at an overall positive assessment of the merger. **In particular, it expects the merged entity to**

- (i) facilitate regulatory action with a view to enhanced financial market stability;**
- (ii) to have a positive effect overall on the competitiveness of the European exchange industry;**
- (iii) to be a step in the direction of further financial integration in Europe.**

This contributes to the consolidation of the European trading market and thus further enhances the functioning of the single market and the single currency.

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# 1 Introduction

The exchange industry in the last two decades, and especially in the past five years, has been changing significantly and dynamically. Only twelve years ago, when European Economic and Monetary Union was launched, stock trading was a largely domestic business mostly run by incumbent national exchanges that until recently had operated on a mutualised non-profit basis. In 2011 the **industry has evolved into an increasingly transnational, largely virtual business with intense competition between exchanges and new Multilateral Trading Facilities**. The changed governance structure conditions the focus of this growth, as most exchanges today are primarily accountable to their shareholders. Today, almost all (96%) exchanges in the developed world are for-profit organizations, of which 40% are listed and thus themselves traded on markets.<sup>1</sup> With average profit margins of 25.7% in 2009, the industry has been a real source of added value for shareholders and the financial centres the exchanges are embedded in.<sup>2</sup>

In the past years, there have been significant changes in the industry (see Section 2). The scale and intensity of this current wave of consolidations has led some observers to describe M&A activity in this industry as the **'end game' of Western regulated exchanges**.<sup>3</sup> Indeed, with emerging market players and alternative trading platforms combining to change the nature of global competition, the focus has returned to achieving global scale and scope in equity, bond and derivatives trading, as well as clearing and settlement, through M&A transactions. The commoditisation of many types of trades requires large exchanges and clearing houses to handle larger volumes and thus recover the significant infrastructure costs, whilst reducing transaction prices for end-users. In this context, **the merger between Deutsche Börse Group (DBG) and NYSE Euronext (NYX) could be regarded as only one step towards the consolidation** – albeit the largest to date – of a still very fragmented European and transatlantic industry.

**But market consolidation is only one aspect of this merger. Policy discussions, public debates and media coverage have raised numerous questions about the costs and benefits for European financial centres and markets and particularly about the pros and cons from a regulatory point of view.** Those elements of the discussion are addressed in this study. But in addition, the study also seeks focus on areas that have received relatively little attention thus far.

**Firstly, the study aims at bringing into the debate the impact of the merger on financial stability, a policy dimension that should be expected to rank highly on policy-makers' agendas in the wake of the financial crisis.** Also, rather little has been said about the overall role of cost efficiency, integration and harmonisation goals in relationship for instance to financial stability.

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1 World Federation of Exchanges (2010). Cost and Revenue Survey.

2 Ibid.

3 PricewaterhouseCoopers (2011). Trading blocs: What next for the stock exchanges?. Report released August 2011.

This gap in the discussion creates the impression that the main policy trade-offs have received rather little attention.

Secondly, it is striking that the discussion of this merger has focused strongly on questions of national sovereignty, creating the impression of a ‘zero-sum game’ in the competitiveness of European financial centres. Naturally, such competitiveness concerns must rank highly with national policy-makers.<sup>4</sup> In a global context, however, the struggle for competitiveness can hardly be regarded any longer as a zero-sum game involving European financial centres. Instead, **Europe is competing with other regions for global relevance**. It is therefore more relevant to look at the merger from a pan-European perspective. Yet, as appears clear from paradoxical statements of concern, there seems to be uncertainty about the impact of the merger<sup>5</sup>: representatives of the London financial centre have expressed concerns that the merger will support the rise of Frankfurt at the expense of London as a financial hub. At the same time, representatives of both Frankfurt and Paris have expressed similar concerns about the adverse impact that this merger might have on their own financial centres vis-à-vis New York, while in New York the outcry about the decline of the importance of New York as a global financial centre in terms of its European peers has been equally loud. Such statements indicate a certain degree of ambiguity about who will actually gain from the merger.

## 1.1 Scope of the Study

This study does not seek to present a cost-benefit analysis. Rather, it aims to provide an analysis of the impact of the merger in terms of the main choices, opportunities and trade-offs that regulators and policy-makers are facing in the context of the merger. There are **three main policy dimensions** that jointly define the core goals of policy-makers and regulators in the European financial markets and in securities trading. Those three dimensions are at the heart of the analysis presented here:

- **Regulation and stability:** Regulated exchanges and clearing houses, such as Deutsche Börse and NYSE Euronext, form the core of the European securities and settlement infrastructure and are thus crucial for the stability of the European markets. How does the merger fit into the regulatory landscape, given the post-financial crisis regulatory efforts to achieve a more stable financial market infrastructure? What can the merger contribute to efforts to address increasing intransparency and growing complexity (e.g. due to

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4 Similar debates about financial centre competitiveness were discussed in the context of the introduction of the euro. For a comprehensive analysis of the impact on European capital markets at the time, see Matern, Frank, Achleitner, Ann-Kristin, Streit, Clara C., Seifert, Werner G. & Voth, Hans-Joachim (2000). *European Capital Markets*. Macmillan, London.

5 For an overview of the initial reactions to the merger, see for instance an article by James Quinn in the *Telegraph* (2011). *Stock exchange mergers: the fight for global dominance*. 13 February 2011. For a more recent perspective on these issues, see Jeremy Grant in *The Financial Times* (2011). *Quick View: What next for DB-NYSE probe?* 7 August 2011.

dark pools and OTC markets)? What can a transatlantic entity do to avoid the regulatory race to the bottom of the past? How does the merger impact the stable conduct of monetary policy in the euro area?

- **Integration, efficiency and harmonisation:** Creating integrated, cost-efficient markets to support the single market in financial services has been a particular focus of various regulatory efforts by the Commission. The merger has raised concerns about increasing concentration in derivatives markets, but it also has the potential to yield economies of scale and scope. What cost efficiencies have already been achieved in trading and post-trading? What are the remaining challenges, particularly with respect to cross-border trading, where the merger might have a direct impact? How does potential consolidation resulting from this merger affect the fragmentation of the European markets? To what extent can this merger be a step in the direction of harmonising transatlantic markets?
- **Financial centre competitiveness:** As discussed above, the ability of a financial centre to compete is indirectly linked to the presence of a large, competitive exchange providing access to global capital markets for financial institutions, governments, large-cap firms and small- and medium sized enterprises (SMEs). What is the trajectory of European financial centres' competitiveness in the face of global competition? How does the merger impact the varying comparative advantages of the European financial centres?

A look at the development of the exchange industry over the past decade reveals that there can be **trade-offs between these three policy goals**. One can represent them as a **'triangle' of competitiveness, integration and stability that can analytically be depicted as a regulatory 'trilemma': three desirable policy objectives exist, but only two of them can be actually realized at the expense of the other.**<sup>6</sup> Efforts to support competitive, integrated and cost-efficient markets do not necessarily result in enhanced financial stability. This was evident in the securities trading and post-trading industry, both pre-crisis and post-crisis. Before the crisis, the successful efforts to integrate markets and open up competition culminated in substantial cost savings and more competitive exchanges at a global level. However, some aspects of the unregulated and more opaque competition undermined stability. The OTC derivatives market in particular contributed to instability and contagion, as risky exposures to defaulting firms spread quickly through an equally competitive but more opaque banking system. After the crisis, a similar pattern can be seen in the introduction of the pro-competition Markets in Financial Infrastructure Directive (MiFID), which opened up competition in exchanges to a significant extent. The cost reduction efforts and competitiveness effects are clearly visible, but so are the unintended consequences of increased intransparency and fragmentation as well as the resulting risks to financial stability.

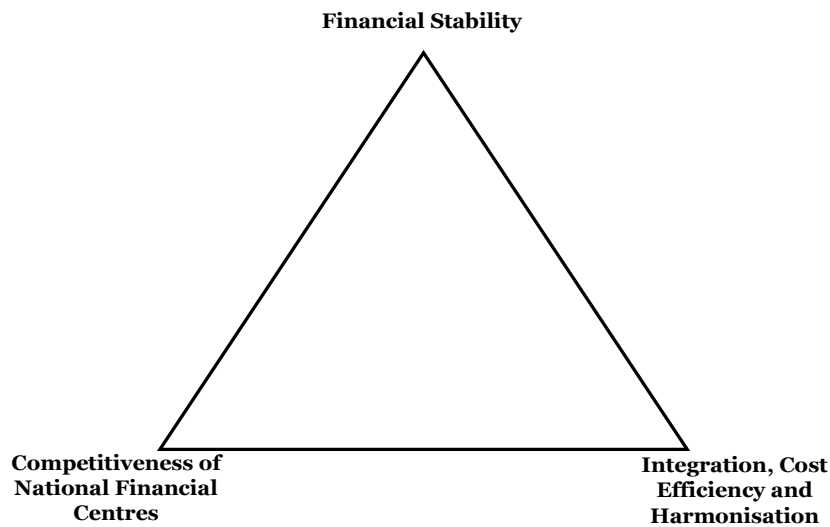
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<sup>6</sup> For a related but different type of policy trilemma in financial supervision see Dirk Schoenmaker and Sander Oosterloo (2008). A New Financial Stability Framework for Europe. *Financial Regulator*, Vol 13(3), December 2008. The trilemma concept expressed reflects ideas developed in the context of an ongoing PhD dissertation project by Gundbert Scherf supervised by the author of this study.



FIGURE 1

**The trilemma in trading and post-trading regulation and policy-making**



SOURCE: Author based on concepts currently developed in supervised PhD work by Gundbert Scherf

## 1.2 Structure of the Study

The analysis of the impact of the merger along this triangle or trilemma is structured as follows: **Section 2** sets the stage and takes a look at the trends and discontinuities affecting this fast-changing industry; Sections 3-5 then deal with each of the policy dimensions, namely regulation and financial stability (**Section 3**), financial integration, cost efficiency and harmonisation (**Section 4**), and financial centre competitiveness (**Section 5**). Each of these three sections first establishes the baseline and then assesses the expected impact of the DBG-NYX merger. A **brief conclusion (page 50)** summarizes the implications for policymakers.

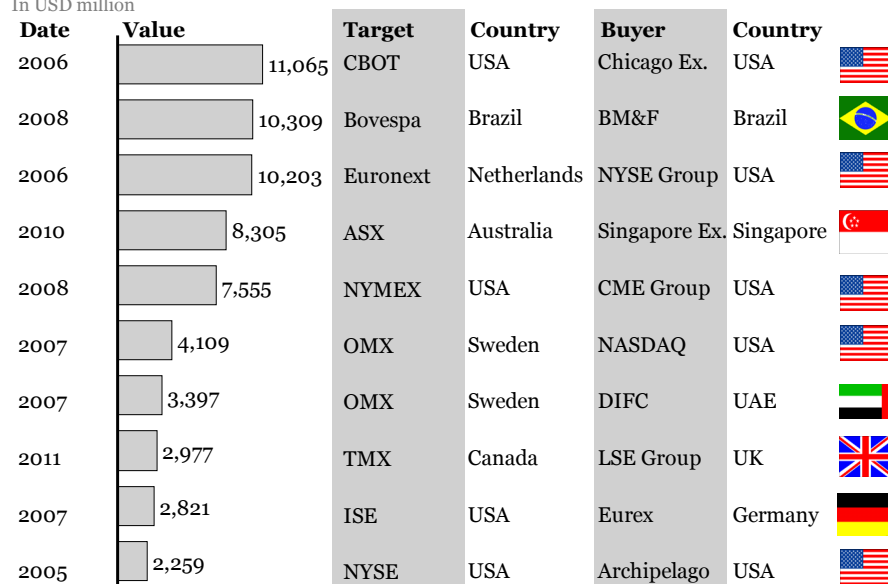
## 2 Trends and Discontinuities in the Exchange Industry in Europe

More than three years after the beginning of the financial market crisis, the exchange industry has picked up momentum and is continuing along its trajectory towards fully-fledged consolidation. As a look at the largest global mergers in the exchange industry shows, this sector is a highly dynamic one. Consolidation had been ongoing prior to 2008 and only slowed down during the crisis, with only one deal of any significant size in the crisis year of 2008 and none in 2009 (see Figure 2).

FIGURE 2

### Largest stock exchange mergers globally

Total transaction value and transaction partners  
In USD million



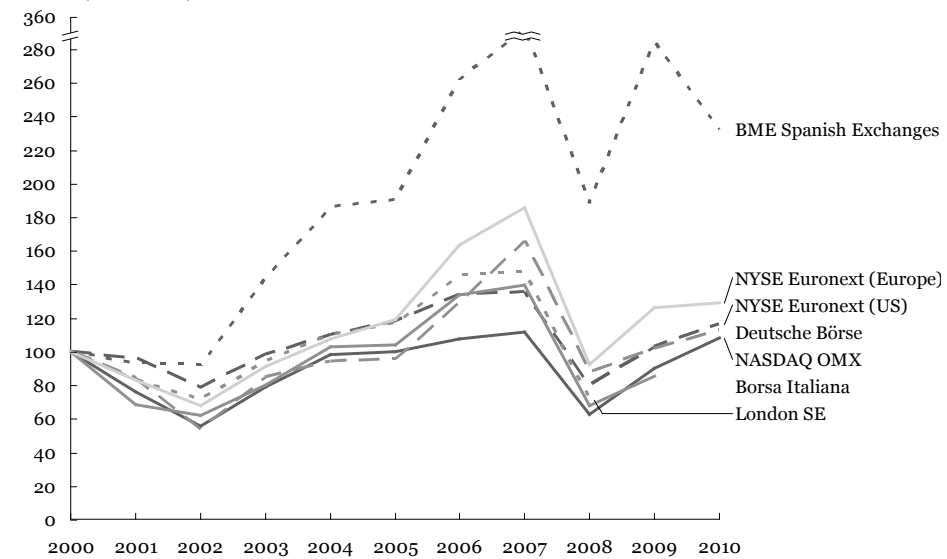
SOURCE: Author based on Thomson Reuters; Die Welt

The key driver behind the successful growth and transformation of exchanges and clearing providers has been the marketisation of the European financial systems, where stock market capitalisation has grown steadily across all economies in the years from 2002 to 2002, returning to – and in some cases exceeding – the levels achieved before the dot-com bubble burst in the early 2000s. The financial crisis naturally put a dent in this long-term growth pattern but since then capitalisation levels of exchanges have been recovering (see Figure 3 below).

FIGURE 3

**Stock market capitalisation of exchanges over time (indexed)**

Stock market capitalisation of selected exchanges (based on USD data)  
Indexed (2000 = 100)



SOURCE: Author based on World Federation of Exchanges data

To serve these increasing market trading volumes, exchanges have not only enhanced their infrastructure to align the provision of liquidity, maturity transformation and information with changing circumstances, but have also developed their capabilities in risk management and extended their service offerings along the value chain into innovative pre-trade (e.g. data provision) and post-trade (e.g. clearing, settlement and custody) services. However, sharp discontinuities such as significant technological evolution, deregulation and increasing demand for cross-border services have made competition much more intense. As a result, the **winners in this changing industry have been those trading platforms and exchange groups that have embraced these changes**, evolving to meet the demand for increasingly pan-European and even global offerings through innovative products and technologies, but also through strategic moves such as mergers and partnerships.

The planned merger between DBG and NYX must thus be seen in the context of structural changes (2.1). These changes have created a need for European consolidation and global partnerships (2.2). However, despite the clearly positive effects on the industry, cost efficiency has had an ambiguous affect on its performance (2.3), as large parts of the trading market still are fragmented, under-regulated and intransparent. It is in the context of these ensuing challenges in a changing industry that the DBG-NYX merger has emerged as a strategic option for both entities.

## 2.1 Structural Forces of Change

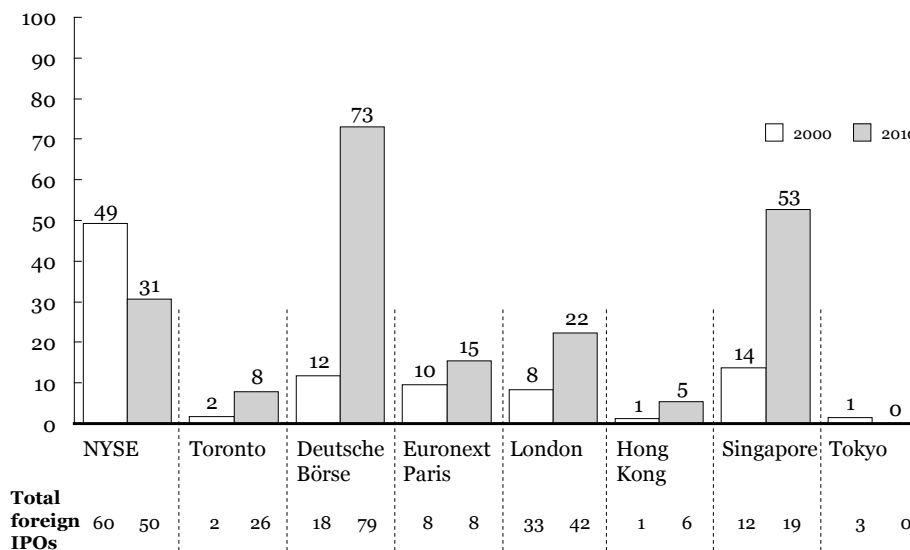
The trading and exchange market has been subject to three major forces of change of political, economic and technological origin. These forces of change have unfolded their significant impact in parallel and have combined to transform market structures and conduct in Europe:

**i) Internationalisation:** With global cross-border capital flows growing by 10% per annum in the 1990s and 19% per annum from 1998 to 2006, before dropping in the course the crisis and then rebounding,<sup>7</sup> the **trading business has become more internationalised and increasingly cross-border**. In equity markets, more than a quarter of trading turnover takes place on pan-European Multilateral Trading Facilities (MTFs).<sup>8</sup> With less IPOs in total relative to ten years ago, large financial centres and their home exchanges are competing to list also new international IPOs. This is now no longer an American phenomenon, with the NYSE already taking a large share of foreign IPOs in 2000. Both the Singapore exchange and Deutsche Börse have seen their share of foreign IPOs increase from small levels in 2000 to approximately 50% and 70% respectively in 2010. Despite many challenges remaining on the supply side of cross-border trading, such as the fragmentation of the European market, the demand for trading and post-trade services is increasingly also international.

FIGURE 4

### Share of foreign listings in new listings: 2000 and 2010

Share in % (absolute values below)



SOURCE: Author based on World Federation of Exchanges (WFE) data

7 McKinsey Global Institute (2009). Mapping Global Capital Markets – 4th Annual Report.

8 Diego Valiante (2011). NYSE Euronext – Deutsche Börse Merger: Let the dance go on! ECMI Policy Brief No. 18/ March 2011.

ii) **Technological change:** When physical trading on the Deutsche Börse floor was discontinued in July 2011, this was only a symbolic step at the end of a continuous trend. Automated trading on electronic exchanges has made **trading a largely virtual business** in which market participants rely on exchanges to provide fast, reliable communication and computing technologies to facilitate new trading strategies. Traders are now demanding higher execution speeds to successfully deploy the algorithmic and high-frequency trading strategies that are enabled by technological innovation. While investment in these innovative technologies remains costly, higher trading volumes on the platforms with reduced order sizes allow large platforms to achieve economies of scale. As a result, trading costs are declining and quoting traffic and liquidity are on the rise, as Angel, Harris, and Spatt show in depth for the US market.<sup>9</sup>

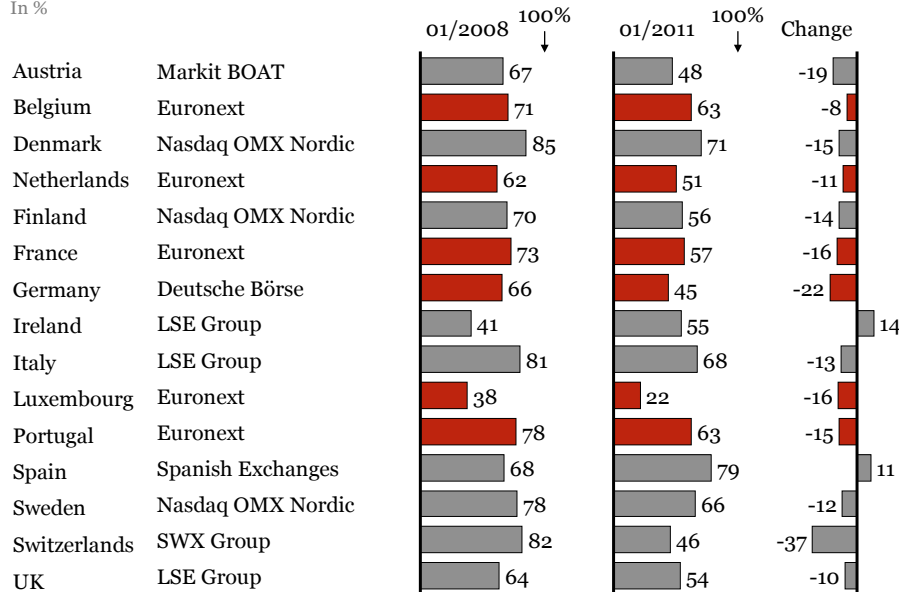
iii) **Liberalisation:** Since the launch of EMU, the European regulatory authorities, spearheaded by the European Commission, have **successfully advanced competition and cost efficiency in the trading and post-trading industry** through liberalisation. The introduction of MiFID in 2007 ended the ‘concentration rule’ under which regulators in some countries could request the execution of trades on regulated exchanges. This change has opened up competition to new entrants such as Electronic Communications Networks (ECNs) and Multilateral Trading Facilities (MTFs). Most incumbent exchange market shares have dropped between 10 and 20 percentage points from 2008 to 2011 alone. Deutsche Börse, as well as all Euronext exchanges, have suffered a loss in trading volume market share in the magnitude of 8 to 22 percentage points in those three years (see Figure below). This volume has largely gone to new MTFs as well as unregulated and in-transparent trading venues, as shown below.

FIGURE 5

**Change in share of trading through incumbent exchanges in Europe**

Market share based on total trades by trade volume (January 2008 and 2011)

In %

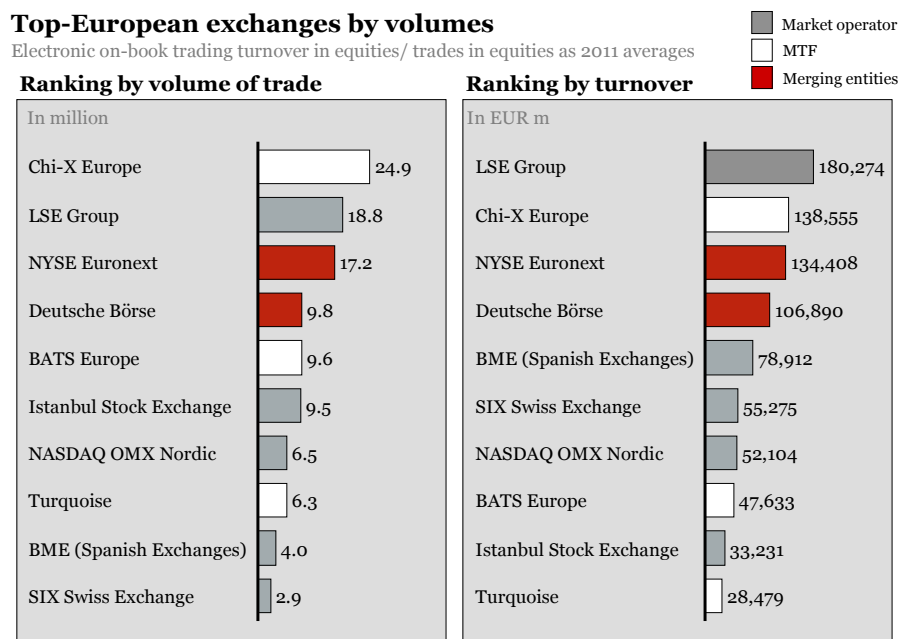


SOURCE: Author based on Thomson Reuters Market Share Reports

9 Angel, James J., Harris, Lawrence E., and Spatt, Chester S. (2010). Equity Trading in the 21st Century.

As a result of these changes, the European trading, clearing and settlement market has undergone structural change. Competition has become much fiercer as trading costs have dropped across asset classes, effectively commoditising equity trading. Trading in traditional asset classes such as equities and bonds has declined in terms of revenue contribution, which has led successful exchanges to diversify into the regulated trading of derivatives – a strong growth market. New players have entered the competitive scene, with a total of 49 players in the ‘lit market’ (regulated markets and MTFs), plus 32 in the ‘dark markets’.<sup>10</sup> MTFs that entered the market only in the last five years, such as Chi-X, BATS and Turquoise, have already entered the top 10 in terms of trading volumes.

FIGURE 6



SOURCE: Author based on Federation of European Securities Exchanges (FESE); World Federation of Exchanges

## 2.2 Evolving Business Models and Corporate Strategies

As new alternative and specialized exchanges and MTFs have entered the market, **the market has become more fragmented**. Given the increasing globalisation of the trading and clearing industry, observers, regulators and market participants alike noted that there was a risk of the European market becoming *too* fragmented.<sup>11</sup> This has posed the **challenge for exchanges to integrate and consolidate, so as to capture sufficient volumes** to enable them to meet trader demands for lower transaction costs and higher liquidity. As a consequence, **exchanges and clearing systems have adapted their business models and corporate strategies** to survive in a more competitive environment.

10 Gomber and Pierron (2010). MiFiD – Spirit and Reality of a European Financial Markets Directive.

11 Jens Tapking, ECB, and Jing Yang, BoE, (2004). Horizontal and vertical integration in securities trading and settlement. Working Paper No. 245

In terms of business models, the exchange and clearing market has seen the persistence as well as adoption of vertical integration strategies by exchanges. Exchanges have reacted to market demands for the provision of clearing and settlement services on the same platform. Pagano and Padilla find that the **benefits of the integrated model arise mainly from efficiencies in clearing and settlement through economies of scale and scope and network effects.**<sup>12</sup> A key efficiency factor relates to the elimination of double marginalization that separate clearing could involve. Because of these efficiency benefits, DBG as well as most leading derivatives exchanges offer integrated clearing houses on the same platform, including market players such as CME Group, ICE, NASDAQ OMX and the Hong Kong Exchange, as well as the Australian Securities Exchange and the Sydney Futures Exchange. Other players such as the London Stock Exchange have also moved towards the integrated model – in the case of the LSE through its acquisition of the Italian exchange. This will enable it to offer integrated central counterparty and central depository services, from which its newly launched ‘Turquoise Derivatives’ derivatives platform can also benefit.

Two strategies have been particularly prevalent in recent years in moves to achieve scale and scope:

- **Consolidation/M&A:** As shown clearly in Figure 8, there have been significant consolidation efforts through various attempted and successful mergers in the American and European exchange markets. **What used to be 20 reasonably large exchanges are now turning into a handful of consolidated exchange groups that are looking to advance scale and scope to meet globalised demand.**<sup>13</sup>
- **Partnerships:** Where mergers have not been deemed feasible or possible, **exchanges have entered into partnerships to enhance their scale and scope through cooperation,** for instance in product development or sales. Like mergers, these partnerships are increasingly global in nature, reflecting the globalisation of the industry. Most recently, the Chicago Mercantile Exchange Group (CME) and the Osaka Securities Exchange publicly announced a deal in which they would ‘jointly develop and market futures contracts in a move that will further expand the CME Group’s global franchise at a time of increasing competition and consolidation in the global exchange sector.’<sup>14</sup> As another example, following the DBG-NYX merger announcement, Hong Kong Exchange and Clearing Ltd

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12 Marco Pagano and Jorge Padilla (2005). *The Economics of Cash Trading: An Overview*.

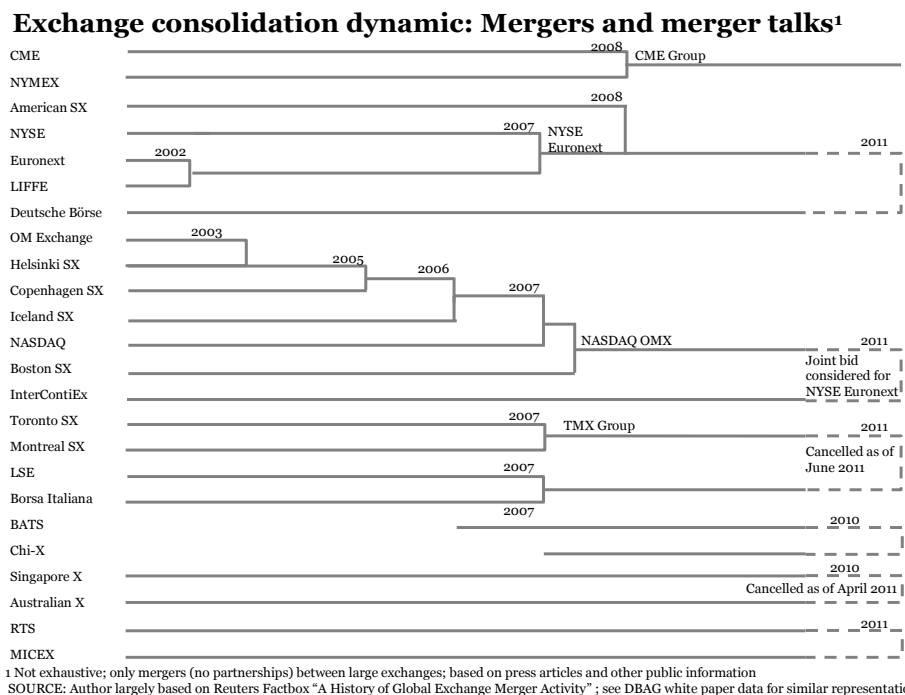
13 As Valiante finds in a recent policy brief on European exchange markets: ‘Organised trading platforms are day-by-day extending their boundaries to a more global scale and into more complex asset classes, for which the provision of execution and related services is already an important source of revenues. Exchanges need now to redesign their business models in order to keep pace with changes in market structure. To grow and gain business at global level, exchanges are currently consolidating businesses to acquire relevant know-how and economies of scale (...).’ See Diego Valiante (2011). *NYSE Euronext – Deutsche Börse Merger: Let the dance go on!* ECMI Policy Brief No. 18/ March 2011. p.1.

14 Financial News (2011). *CME Group and Osaka to build new futures contracts*. Article dated 26 July 2011, accessed online 27 July 2011.

declared its willingness to discuss partnerships that would complement its China focus in order to stay competitive.<sup>15</sup>

The planned merger is thus occurring in a highly competitive phase of consolidation and transformation in the European and global exchange market. Continued merger activity has seen (unsuccessful) merger talks in the last year between Tokyo and Osaka Exchange, the London and Toronto Stock Exchange, and the Singapore Exchange and Australia Exchange. Moreover, the leading Asian exchanges of Hong Kong Exchanges & Clearing, Shanghai and Shenzhen unveiled joint venture partnership talks in August 2011, stating that they are looking into the joint development of index and other equity derivative products, as well as the creation of new indices.<sup>16</sup> From this perspective, it is understandable that DBG and NYX see their merger as a crucial element in their longer-term strategy to acquire a global presence from the position of strength that the merging entities still enjoy by virtue of their strong long-term growth and profitability. However, a look at the global derivatives market shows that competition will continue to be fierce. Just recently, in May 2011, Chi-X's new derivatives platform was joined by LSE's Turquoise Derivatives, a new pan-European platform for futures and options that – in combination with the acquired Canadian EDX derivatives platform – is set to become a competitive force in the European market.<sup>17</sup> Additionally, large players such as the Intercontinental Exchange (ICE) and CME Group have already launched projects (ICE) or indicated their intentions (CME) to enter the clearing market with European clearing houses.

FIGURE 7



15 MSNBC (2011). Exchanges seek partners after Deutsche Boerse's NYSE bid. Article dated 10 February 2011, accessed online 3 July 2011.

16 Reuters (2011). 3-HKEx says in JV talks with Shanghai, Shenzhen exchanges. 18 August 2011.

17 Ibid.



## 2.3 Effects on Industry Performance

In a nutshell, the **integration and consolidation of trading markets in Europe is well under way but as yet incomplete**. The efforts at integration have clearly realised some benefits (these will be discussed in Chapter 4). However, this process is still ongoing and some of the unintended side effects resulting from efforts focused strongly on increased competition entail certain risks to systemic stability (Chapter 3). This is not surprising in light of a review of some of the early literature on the nature of competition in the trading industry. Research going back as far as Hamilton (1979)<sup>18</sup> has established that there are two countervailing forces at work that create a tension between competition on the one hand and stability and integration on the other: while increased competition attracts more exchanges and clearing houses to enhance competition (competition effect), it also reduces the centralisation of the industry and prevents economies of scale from being realised (fragmentation effect). When looking at the reality of the European trading and post-trading market, it becomes clear that the competition effect has been dominant in recent years. The **positive effects of this intensified pan-European competition have led to declining trading costs**, by most accounts and for most products, as studies by Oxera for the EU Commission (2009 & 2011) have found.<sup>19</sup> At the same time, largely in line with theoretical predictions, the **industry structure remains fragmented whilst intransparency has increased** (see below) **and certain risks to instability, particularly the large unregulated OTC trading volumes, have not been mitigated** (see previous section).

In this context, the introduction of MiFID – with its focus on increasing competition and efficiency – has had unintended adverse effects on market transparency. Increasing volumes of trades are being channelled through more intransparent OTC markets using broker/dealer crossing networks (BDCNs) and dark pools.<sup>20</sup> Gomber and Pierron (2010), the authors of this extensive study on the impact of MiFID, also find that price transparency has diminished as investors attempt to capture as much information as possible about their peers' trading patterns and strategy, while at the same time minimising their own information leakage. Gresse (2010) also looks at the post-MiFID period and finds that the enforcement of pro-competition regulation has increased fragmentation, leading to a deterioration in execution and price quality.<sup>21</sup> **Cross-border trading costs are still higher than domestic trading costs due to fragmentation and the incomplete integration and consolidation of the European trading and post-trading markets.** The same is true for clearing and settlement services.<sup>22</sup>

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18 James Hamilton (1979). Marketplace Fragmentation, Competition, and the Efficiency of the Stock Exchange. *Journal of Finance*, 34(1), 171-187.

19 Oxera for the EU Commission (2011). Monitoring prices, costs, and volumes of trading and post-trading services.

20 Gomber and Pierron (2010). MiFiD – Spirit and Reality of a European Financial Markets Directive.

21 Gresse (2010). Multi-Market Trading and Market Quality.

22 Ibid.

To conclude this short review and contextualisation: **After years of liberalisation and industry transformation, there is now a need for consolidation in order to restore the role of stability vis-à-vis competitiveness, which are equally important public policy objectives.** The past years have been dominated by the overriding concern for enhanced cost efficiency and competition, thereby lowering the scope for policies geared towards stability concerns. In this context, the merger not only appears to be a plausible next step within the industry, but also to be a desirable opportunity, from a general macroeconomic perspective: It creates a more liquid trading platform and clearing house that operates transparently and that will contribute to the much needed integration and stabilisation of the European financial markets.

# 3 Regulation and Financial Stability

## 3.1 Baseline: Global Unfettered Market Segments and Their Discontents

Global capital flows demand harmonised global regulatory regimes for trading and post-trading to ensure financial stability. However, **regulators of the securities and securities infrastructures industry have been struggling since the onset of the internationalisation of markets in the 1980s to create a transatlantic consensus** on the necessary regulatory standards for financial stability. MIT political economist David Singer, in a comparative analysis of the progress on banking regulation and the lack thereof in securities regulation, concludes that in securities ‘the specter of financial stability was not a great enough incentive for regulators to converge on an international standard. Instead, regulators were driven by domestic political circumstances’, which he finds were largely based on considerations centred around the competitiveness of the domestic industry.<sup>23</sup> Consequently, the industry called for efforts to achieve joint transatlantic regulation prior to the financial crisis, but these have not culminated in any integrated transatlantic regulatory regime, which is why Deutsche Bank Research fittingly calls it a ‘work in progress’.<sup>24</sup>

With risks to financial stability largely opaque and financial markets thriving, there was an at least implicit assumption that competition and competitiveness would also bring about stability as a natural side effect. As such, **much of the regulatory efforts in Europe pre-2008 were oriented on achieving a single market** (particularly in cash trading), **and thus focused more on integration, efficiency and harmonisation** (see Chapter 4 on these policy goals) **rather than financial stability**. Moreover, in most areas, where consensus on financial stability goals was achieved either regionally or internationally, the principle-based regulatory logic has been to maintain national flexibility in implementation and not to punish market innovation. Theoretically, this would have allowed for more stringent implementation of agreed standards and supervision of compliance with those standards. In reality, this principle-based regulation often opened the window for varying degrees of stringency of implementation and supervision. As too much reliance had been placed on national supervisors, a regulatory race to the bottom, also referred to as ‘systems competition’,<sup>25</sup> that was driven by regulatory arbitrage ensued in many areas of financial market regulation.<sup>26</sup>

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23 David Singer (2007). *Regulating Capital: Setting Standards for the International Financial System*. Cornell University Press.

24 Steffen Kern, Deutsche Bank Research (2008). *EU-US financial market integration – a work in progress*. EU Monitor 96. Financial Market Special.

25 Hans-Werner Sinn (2004). *The new systems competition*. *Perspektiven der Wirtschaftspolitik*, 5(1), 23-38.

26 For the practitioner’s perspective on this phenomenon see: *New York Times* (2011). *Geithner Warns Against Race to the Bottom*. June 6th, 2011.

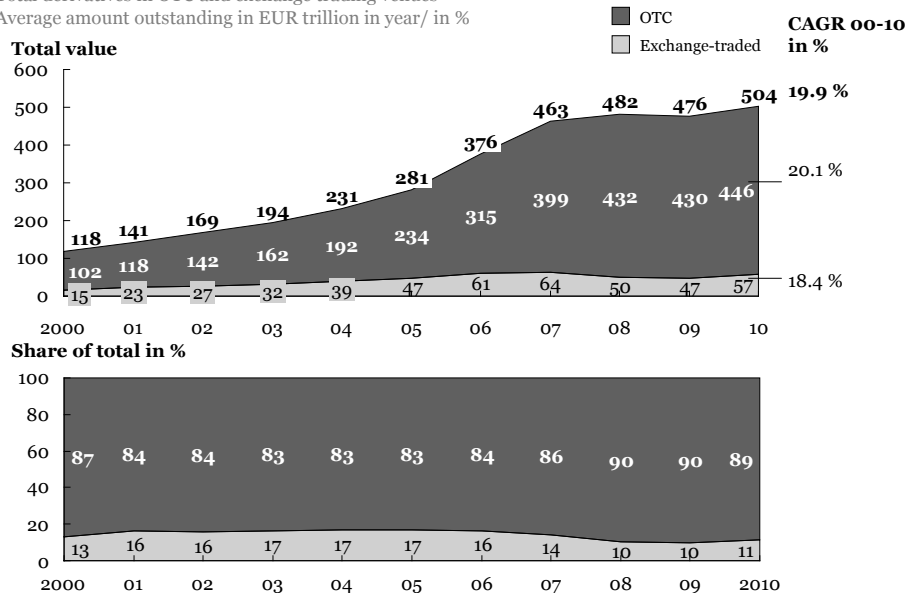
The financial market crisis has returned the reduction of systemic risk and the creation of financial stability to the top of the regulatory agenda and, as such, obviated the need for more global, more stringent and more rule-based regulation. Particular attention has since been paid to those areas of the financial markets that were identified as key drivers of instability in the financial crisis. As such, the **huge unregulated over-the-counter (OTC) derivatives markets have become the centre of attention in current regulatory efforts**, leading the G20 to assert in the 2009 Pittsburgh Declaration that: ‘All standardised OTC derivative contracts should be traded on exchanges or electronic trading platforms, where appropriate, and cleared through central counterparties by end-2012 at the latest. OTC derivative contracts should be reported to trade repositories. Non-centrally cleared contracts should be subject to higher capital requirements.’<sup>27</sup> The 2010 Toronto Declaration added that measures should be taken to ‘improve transparency and regulatory oversight of [OTC] derivatives in an internationally consistent and non-discriminatory way.’<sup>28</sup> The primary systemic risk arose from the fact that, due to the lack of a central counterparty (CCP) in these contracts, OTC derivatives exposed the counterparties to potential serial knock-on failures from one counterparty to another if one party to a contract defaulted.<sup>29</sup> Given the fact that 90% of the strongly growing approximately EUR 500 trillion global derivatives market is traded over the counter, this opacity and complexity still represents a major threat to financial stability, both in Europe and globally. Volumes traded on regulated exchanges globally are still relatively marginal in relation to the predominant OTC market (see Figure 8).

FIGURE 8

**Total derivatives market broken down by exchange-traded and OTC**

Total derivatives in OTC and exchange trading venues

Average amount outstanding in EUR trillion in year/ in %



SOURCE: Author based on BIS, FESE, WFE data

27 G20 (2009). Leaders' Statement at The Pittsburgh Summit. 24-25 September 2009.

28 G20 (2010). G20 Toronto Summit Declaration. 26-27 June 2010.

29 IMF (2010). Global Financial Stability Report: Meeting New Challenges to Stability and Building a Safer System.

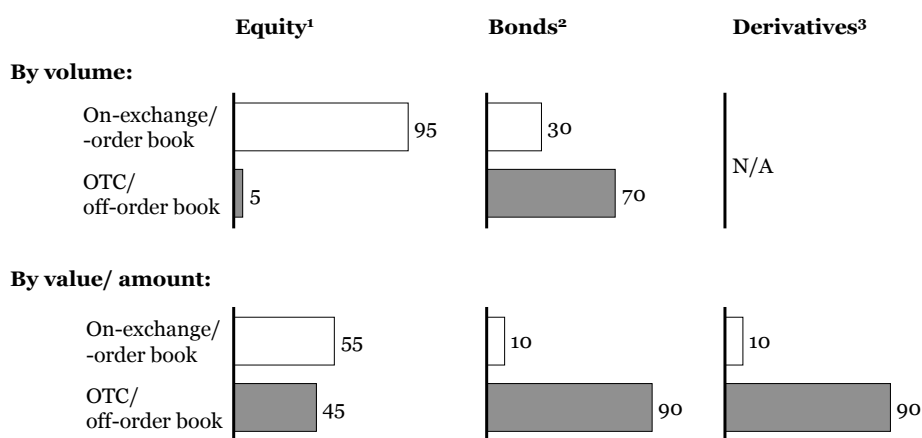
This **regulatory challenge of opacity and complexity is certainly most prominent in the derivatives market due to its sheer scale and growth**. Estimates of the volume of OTC trading (vs. on-book trading on regulated exchanges) suggest that in both equity and bond markets, ~45% and ~90% respectively of trading by volume outstanding takes place over the counter, which reveals that transparency issues are not limited to global derivatives markets. Nevertheless, counter-parties here will often include sovereigns and companies with a more transparent standing and with more sources of (implicit) collateral, thus, reducing systemic risks.

FIGURE 9

**Securities market overview: Trading on-exchange and OTC**

2010 estimated break-down based on available data by asset class  
In %

ESTIMATED AND ROUNDED



<sup>1</sup> Based on Thomson Reuters market share data for European equity trading (using MiFID OTC definition)

<sup>2</sup> Based on WFE/ FESE /ISDA/ Oxera/ EU study (2011) data on bonds traded on-exchange and bond deals negotiated

<sup>3</sup> Based on BIS value outstanding data for global derivatives market

SOURCE: Author based on BIS; Thomson Reuters; FESE; World Federation of Exchanges; ISDA

Nor does an analysis of the trends in trading markets suggest that this is going to reverse soon. On the contrary, the **unintended consequences of a long-standing regulatory focus on increasing competition and cost efficiency are visible in terms of systemic risk, fragmentation and intransparency**, as the shown by the rather alarming findings of a study on the consequences of MiFID on European markets<sup>30</sup>. The authors find that

- Increasing volumes of trade are channelled through more intransparent OTC markets, using channels such as broker/dealer crossing networks (BDCNs) and dark pools.
- Market shares of OTC venues in trading turnover reached levels of approximately 40% throughout 2008 and 2009.
- This OTC trading has also extended to smaller order volumes, since – despite the intentions of MiFiD to limit OTC to ‘dealings above standard market size’ – 54% of OTC trades were *below* standard market sizes in 2010.

30 Peter Gomber and Axel Pierron (2010). MiFiD – Spirit and Reality of a European Financial Markets Directive.

- Price transparency has gone down, as investors are trying to capture as much information about their peers' trading patterns and strategy while minimising their own information leakage;

The regulatory efforts in Europe enshrined in the European Market Infrastructure Regulation (EMIR), and in Dodd-Frank in the United States, can be seen as the regulatory response to restore financial stability. And the fact that the EMIR initiative will culminate in a regulation that must be implemented directly by the member states, rather than a directive, is evidence of a shift towards a rules-based approach to financial market regulation. The objective of EMIR is to improve transparency and enhance market safety and regulatory oversight after the financial crisis, particularly in OTC markets. The central elements of EMIR will be a direct requirement for mandatory clearing and reporting of derivatives trades, prudential and business requirements for central counterparties (CCPs), and, possibly the creation of more interoperability for CCP (equities) operations. These CCPs, such as DBG's Eurex Clearing, facilitate stability by providing safeguards, multilateral netting and risk management services, thus reducing total exposures and systemic risk substantially, while also economising on margin requirements. However, the diminished prominence attached to stability concerns and the competing domestic considerations regarding the differential impact that any transatlantic stability regime might have on the competitiveness of the domestic industry are likely to make this a complex task.

### 3.2 Impact of the Merger: Strengthening the Infrastructure for Regulated, Transparent and Stable Markets

Against this backdrop, the **DBG-NYX merger is consistent with and contributes to regulatory efforts towards enhancing European and transatlantic financial stability**. Current regulatory efforts have stressed the need to make the financial infrastructure more resilient to the failure of single financial institutions, which in the recent crisis have triggered systemic events.<sup>31</sup> The creation of a consolidated regulated European trading and post-trading platform can provide the infrastructural response to the instability that has emerged from the OTC derivatives market, which still represents approximately 90% of derivatives trading and has been identified as a key driver behind the financial instability in 2007-2009. How exactly larger OTC volumes will be channelled towards regulated markets, MTFs, and OTFs is still to be determined by regulators. However, the creation of counterparties with strong risk management capabilities for derivatives trading will be prerequisite. The ECB and policy-makers have in the aftermath of the financial crisis attempted to increase financial stability by bolstering the post-trading in-

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31 The IMF lists three types of initiatives that have been taken to contain systemic risk: i) preventive measures such as liquidity and capital buffers; ii) containment measures such as resolution frameworks; iii) improvements to the financial infrastructure. See IMF (2010). Global Financial Stability Report: Meeting new Challenges to Stability and Building a Safer System. Chapter 3.

frastructure – with a particular focus on the OTC derivatives market.<sup>32</sup> Thus, from an economic perspective,

- i) **by advancing the key ECB goal of having a CCP within the euro area jurisdiction the merger contributes to key policy efforts of the regulators towards financial stability.** Moreover, from a political economy perspective,
- ii) **the merged entity establishes a market-side prerequisite for further regulatory harmonisation in the European financial markets;** and
- iii) **can give further impetus to aligning regulatory interests of competitiveness and stability across the Atlantic.**

In other words, since a merged entity has no interest in differing levels of regulation in both the United States and Europe, as it does not benefit as a whole from this ‘regulatory arbitrage’, which traders engage in, it can be built on by regulators in their cooperative efforts to harmonise and integrate regulation. The following sections will look at each of these stability topics in turn.

First, the merged company’s **regulated exchange platforms will extend Eurex’ current provision of a pan-European integrated infrastructure for transparent trading offering central counterparty services for larger volumes of trade.** This implies that the deal then also extends liquidity and novation benefits of contracts that Eurex provides already today. The financial crisis has revealed that those increasingly non-regulated derivatives market segments that were lacking central counterparties (CCPs) failed to provide the required levels of transparency, risk management and, consequently, financial stability.<sup>33</sup> There is counterparty credit risk behind every bilateral OTC transaction, meaning the risk that one of the parties to the transaction will become insolvent and fail. Given the accumulation of huge volumes of OTC derivatives positions, the default of single counterparties could lead to a domino or knock-on effect that could trigger a financial crisis and then a recession, as it did in 2008. The resulting web of interconnections and bilateral exposures, coupled with inadequate risk management and collateralisation, results in a high level of complexity, uncertainty and instability, in turn triggering the contagion of defaults that characterised the financial crisis at large.<sup>34</sup>

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32 ECB (2009). OTC derivatives and post-trading infrastructures. Report, September 2009.

The ECB restates here the Governing Council’s decision of 16 July 2009 that ‘the Eurosystem is particularly interested in the availability and use of adequate post-trading infrastructures for the processing of euro-denominated OTC derivatives within the euro area.’ (p. 27)

33 Ibid. For a good overview on the causes of the crisis, see Baily, M. N., Litan, R. E., & Johnson, M. S. (2008). *The Origins of the Financial Crisis*. Business and Policy at Brookings. Also for an overview of the key distinction between exchange-traded and OTC derivatives see: Financial Crisis Inquiry Commission (2010). *Preliminary Staff Report: Overview on Derivatives*.

34 For the role of complexity as a key driver of financial instability and the crisis see Brunnermeier, M. & Oehmke, M. (2009). *Complexity in Financial Markets*.

It is in the area of counterparty risk management that regulated multilateral trading platforms and clearing houses on the one hand and bilateral OTC markets on the other differ in terms of mitigating these risks, as well as minimising the potential impact of their crystallisation. As such, **bilateral contracts traded over the counter** create decentralised networks with mutual financial obligations. Certain commercial vendors provide risk management and clearing services for the transaction, including determining the payment amounts, daily valuations, counterparty credit quality monitoring and record keeping. Additionally, OTC derivatives contracts can equally be subject to:

- **Netting:** The process of offsetting the different exposures owed by the parties.
- **Multilateral compression and tear-ups:** The elimination of redundant contracts.
- **Collateralisation:** The posting of liquid securities as collateral;

The netting effect is indeed substantial and has been growing in line with the markets, allowing for more offsetting due to improved liquidity. Today, netting effects by a factor of five are possible in OTC derivatives markets (see Figure 21 below). However, there are also differences in the OTC clearing services that distinguish them from exchange-based clearing. The key remaining difference is that, in providing these services, vendors do not take on counterparty risk and thus have different incentives. Moreover, prices and exposures are still intransparent, as OTC dealers often transmit bid and ask quotes as well as execution prices only to the parties, including by phone or on electronic order matching platforms. Lastly, OTC dealers manage collateralisation very heterogeneously across various transactions. The 2010 ISDA margin survey of OTC derivatives dealers shows that 30% of OTC derivatives transactions are not collateralised at all – collateralisation practices for the other 70% are very divergent, to the extent that the IMF finds that ‘how much collateral is currently posted against OTC derivative positions is not known with certainty.’<sup>35</sup>

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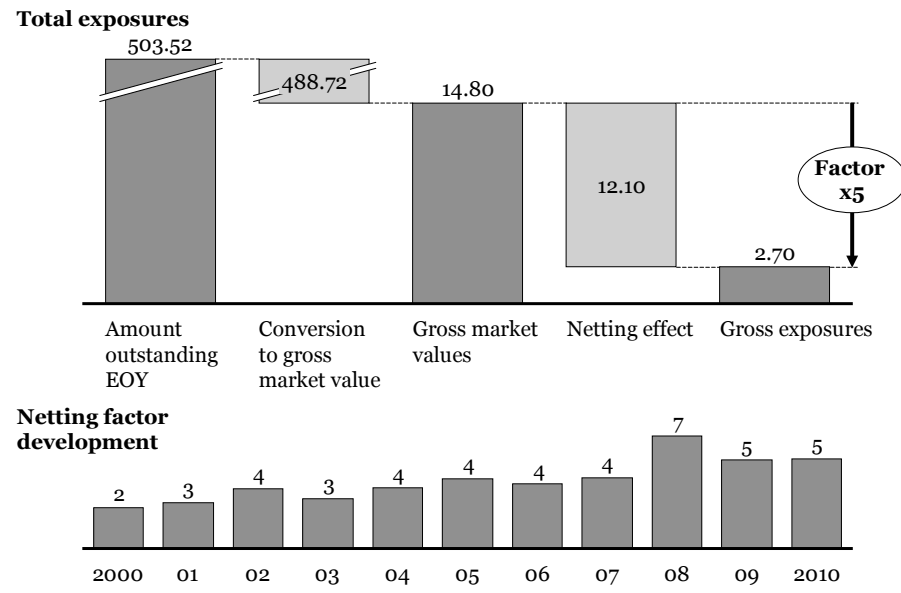
<sup>35</sup> Ibid, p. 5



FIGURE 10

### Global OTC derivative exposures and effect of netting

OTC derivative exposures in EUR trillion in 2010 (EOY values)

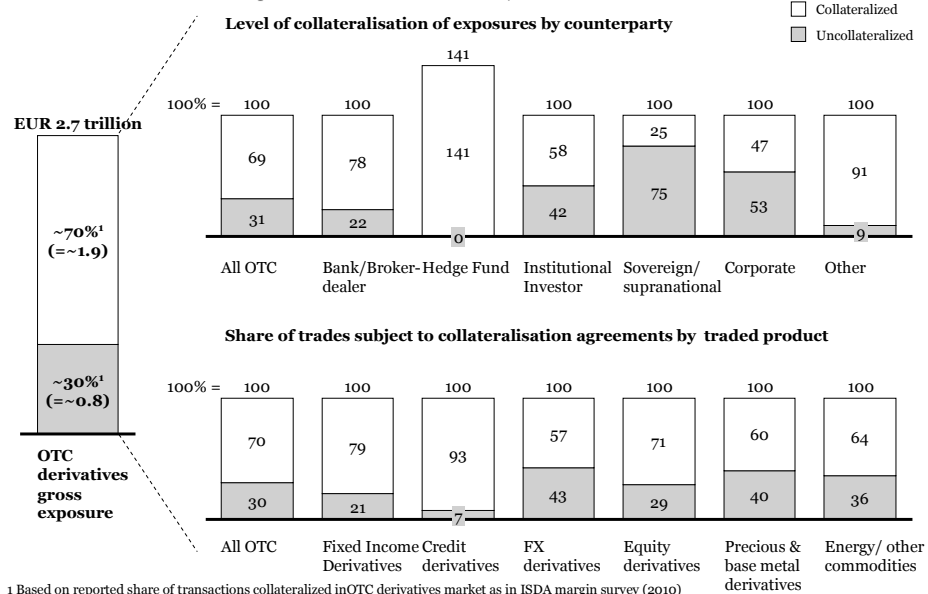


SOURCE: Author based on BIS and ISDA data (2010)

FIGURE 11

### Collateralisation levels in OTC derivatives market

Gross OTC derivative credit exposure in EUR trillion in 2010/ share of total OTC derivatives in %



<sup>1</sup> Based on reported share of transactions collateralized in OTC derivatives market as in ISDA margin survey (2010)

SOURCE: Author based on BIS and ISDA Margin Survey (2010)

Regulated multilateral market infrastructure providers, meaning integrated exchanges such as Deutsche Börse and NYSE Euronext, provide these key central counterparty services and

can offer the central neutral risk management functions. In addition to the functions they can provide in an OTC context (see above), additional CCP benefits comprise.<sup>36</sup>

- **Liquidity and product standardisation:** Providing the crucial scale and depth to the market for enhanced liquidity and advancing standardization – a condition for exchange-traded derivatives trading;
- **Novation of contracts:** Taking on the actual counterparty risk by acting as counterparty to the transaction partners and netting out positions multilaterally through the sum of positions;
- **Additional risk management:** Mitigating various risks, from credit risk to operational risk, through continuous monitoring from trade date to delivery of the underlying;
- **Information provision and transparency:** Providing a central information repository that is also accessible to regulators so as to increase transparency for transactions;
- **Drawing on multiple ‘lines of defence’/‘waterfall’ mechanism:** In the event of default, mobilising multiple ‘lines of defence’ such as mandatory collateral, member guarantee funds, first-loss pools, the other counterparty’s contributions, capital calls on non-defaulting members, access to central bank liquidity and, lastly, the CCP’s own capital;<sup>37</sup>

Thus, more extensive derivatives trading with central counterparties as occurs on regulated exchanges is desirable from a stability point of view. This is reflected in the current shape that EMIR and Dodd-Frank have taken, indicating that they will both regulate in favour of more trading of OTC derivatives on regulated exchanges. Clearly, some of these scale and liquidity benefits could also be reaped by linking CCPs and making them interoperable. However, the additional operational risks associated with this in addition to the required standards and risk management practices make this both a ‘second-best’ as well as a long-shot solution to central stability challenges.

The policy questions that **regulators must now address are whether the market infrastructure for this is in place and, if so, where this infrastructure will be located.** European authorities such as the ECB have expressed a particular interest in locating the central counterparty in Europe, as the conduct of monetary policy is largely affected by the stability of a CCP clearing euro-denominated derivatives. **The merger would in all likelihood create such a larger and, hence, more liquid regulated exchange for derivatives trading in Europe.** There are strong reasons to

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<sup>36</sup> These additional benefits are captured as follows by the ECB and CESR in their guidelines on securities settlement regulation: ‘In view of the greater complexity of OTC derivatives and the relative illiquidity of certain contracts, the Group considered that risk management could differ and, therefore, it was essential for CCPs to be as transparent as possible for both regulators and users and to ensure effective risk management while users are encouraged to deliver price data to CCPs for risk management purposes.’ See ECB/ CESR (2009). Recommendations for Securities Settlement Systems and Recommendations for Central Counterparties in the European Union. p. 9

<sup>37</sup> Ibid.

believe that this new exchange would execute all of the above mentioned stability functions more effectively and more efficiently. With increased scale, the liquidity and novation effects of contracts are likely to become more powerful, reducing net exposures in the system and thus systemic risk. Additionally, central counterparties such as DBG-NYX could capture trade information instantly by integrating trading and clearing on a single platform, thus leveraging this for their risk management and information provision functions. Lastly, European regulated exchanges acting as CCPs may be given access to the European Central Bank's accounts to draw on additional temporary liquidity. The ECB believes that the likelihood of this happening in the context of CCPs for credit default swaps is increasing, stating that 'EU public authorities, as well as a growing share of the European user community, consider [this] a basic requirement for the safe functioning of a CCP for CDS.'<sup>38</sup> It has been announced that derivatives trading and clearing in the new group entity will be located in Frankfurt and thus within the jurisdiction of the European Securities and Markets Authority (ESMA) and the German financial supervisory authority (BaFin) – complemented by the new European Systemic Risk Board (ESRB). It is in this context that the merger provides the opportunity for the creation of a pan-European and transatlantic central counterparty with strong risk management capabilities that can enhance the functioning of the European markets and provide stability for the conduct of monetary policy in the euro area.

Second, the **merged entity can be expected to have a positive effect for regulatory efforts by reinforcing market-side interest in the continued efforts to harmonise European (post)-trading regulation** – an issue that is becoming more relevant with increasing cross-border trading. Currently, central counterparties within Europe are regulated nationally by securities regulators. Both the European System of Central Banks and the Committee of European Securities Regulators have provided guidelines for the further harmonisation of this regulatory area, but their implementation is still a matter for the national authorities.<sup>39</sup> Clearly, the merged entity – with its multiple presences across European financial centres – will also allow national regulatory and supervisory authorities to maintain control over the relevant European exchanges, as the NYSE-Euronext merger case has shown. Harmonisation is, however, a precondition in any globalising or Europeanising market segment; its absence results in regulatory arbitrage and fragmentation, which are clear threats to financial stability. A primary integrated trading platform oriented on standardisation and harmonisation can be built on by joint regulatory efforts at the European and national level. Such market-side interest in (or at least neutrality towards) harmonisation is helpful in a policy area that is very technical and complex and requires market-side participation, as Quaglia finds.<sup>40</sup>

The interest rate derivative markets can be considered as an example of such harmonisation with stability implications. Here, an initial additional benefit of the merger will lie in the ex-

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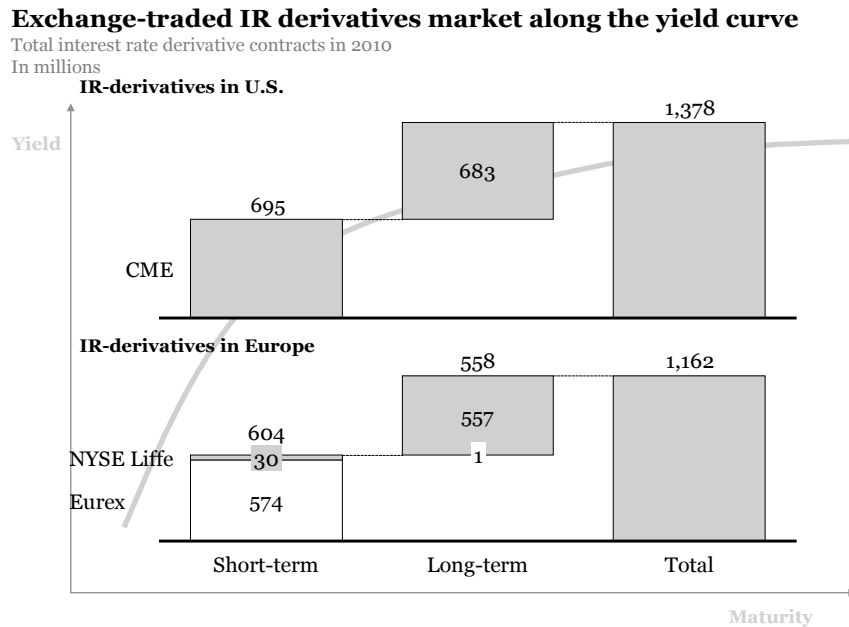
38 ECB (2009). OTC derivatives and post-trading infrastructures. Report, September 2009.

39 ECB/ CESR (2009). Recommendations for Securities Settlement Systems and Recommendations for Central Counterparties in the European Union.

40 Lucia Quaglia (2010). Governing Financial Services in the European Union: Banking, Securities, and Post-Trading.

pected provision of an integrated benchmark yield curve along the short and long end for derivatives, which could facilitate price discovery processes. This will create similar market structures as in the US market, which has already obtained this advantage from the integrated CME Group offering.

FIGURE 12



SOURCE: Author based on BIS, FESE, WFE data

Third, in a somewhat more indirect way the merger provides the market-side prerequisite for creating a converging level of regulation. This can be built on by regulators in efforts to create a regulatory benchmark that discourages regulatory arbitrage between Europe and the United States. The existence of a transatlantic rift through regulatory divergence has been noted by many observers as the largest obstacle to financial stability and the further reduction of systemic risk, and has been a continuing challenge up to the present since the creation of IOSCO (the International Organization of Securities Commissions) as a rule-making body in the 1980s.<sup>41</sup> Even today, after the crisis, this challenge remains formidable despite the upcoming further regulation of OTC derivatives trading and an ongoing development of a new transatlantic framework for CCP risk management by means of the relevant European and US regulatory efforts. In this respect, the IMF, the institution charged with financial stability globally, warns countries to ‘discourage regulatory arbitrage’ as it warns of ‘(...) the possibility that CCPs could compete with each other by lowering collateral thresholds and clearing fees and adjusting the layers of protection in ways that expose CMs and their customers to greater risks.’<sup>42</sup> The root cause of this destabilising ‘race to the bottom’ has been competition between national industry competitiveness considerations and an interest in promoting international financial

41 David Singer (2007). *Regulating Capital: Setting Standards for the International Financial System*. Cornell University Press.

42 See IMF (2010). *Global Financial Stability Report: Meeting new Challenges to Stability and Building a Safer System*. Chapter 3, p.26.

stability, resulting in a trade-off. U.S. Treasury Secretary and former regulator as President of the New York Fed Timothy Geithner recently remarked on the danger of another 'race to the bottom' in relation to the marginalization of OTC derivatives markets, which he finds to have taken place in the run-up to the 2007-2009 financial crisis.<sup>43</sup> To the extent that the new merged entity no longer has an interest in lower standards on either side of the Atlantic to attract higher volumes, it provides a provide a market-side prerequisite for efforts to create a regulatory benchmark for convergence and harmonization between the U.S. and Europe. Outside competition will remain and outside financial centres and regulators might not yet converge to this benchmark. Still, this effect should not be underestimated, given how crucial and powerful national competitiveness considerations have previously been in preventing such regulatory cooperation for more financial stability, as the statements by the U.S. Secretary of the Treasury have shown.

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<sup>43</sup> New York Times (2011). Geithner Warns Against Race to the Bottom. June 6th, 2011.

# 4 Financial Integration, Cost Efficiency and Harmonisation<sup>44</sup>

## 4.1 Baseline: Integration and Fragmentation of European Markets

The following sections will review the status of the European trading and post-trading market in light of the interdependent policy objectives of financial integration, cost efficiency and harmonisation. It will also discuss the impact of the policy efforts, most importantly the implementation of MiFID in recent years, to establish the baseline against which the merger impact needs to be assessed. It reveals that efforts towards these policy objectives have indeed been successful in **creating a more cost-efficient and competitive market environment. However, one side effect is that the market is more fragmented domestically and remains fragmented in the cross-border trading area.** As such, fragmentation has two components: it exists in terms of order flows and reduced sizes of average transactions, which has resulted from the MiFID introduction, and it exists along national market lines, as cross-border markets are still not as integrated.<sup>45</sup> Regarding the latter point, **consolidation** has been necessary for years and **is now urgently required to deliver the desired integration benefits and address the current fragmentation of equities and fixed income markets.**

The integration, efficiency and harmonisation of the European financial markets have always been among the chief goals of the EU and the Eurosystem institutions.<sup>46</sup> These overarching policy objectives have underlain most (de-)regulatory efforts of the European Commission in this market since the introduction of the euro. The macroeconomic motivation for these integration and efficiency efforts was to increase the contribution by financial services to GDP growth by 1.1% p.a. by merging the nationally fragmented liquidity pools into an integrated liquidity pool that could reduce the cost of finance across Europe and stimulate demand and investment.<sup>47</sup> In 2001, the Committee of Wise Men, led by Chairman Lamfalussy, also stressed

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44 Disclaimer: The analysis here is not meant to pre-empt or second-guess the competition analysis that is ongoing at the time of preparation of this report. As such, competition is merely touched upon in terms of the development of the industry at large as integration and harmonisation have proceeded – and not in terms of projections of the merger’s impact on trading costs or similar factors (as a micro-economic competition study would do).

45 Gomber and Pierron (2010). MiFiD – Spirit and Reality of a European Financial Markets Directive.

46 For an analysis and definition of the integration of European securities markets, see ECB Occasional Paper: Heiko Schmiedel and Andreas Schönenberger (2005). Integration of securities market infrastructures in the euro area.

47 London Economics (2002). Final Report to the European Commission: Quantification of the Macro-Economic Impact of Integration of EU Financial Markets.

the importance of integration, efficiency and harmonisation of trading, clearing and settlement for the completion of the Financial Services Action Plan (FSAP), but added, commenting on clearing and settlement, that ‘The process of consolidation should largely be in the hands of the private sector.’<sup>48</sup> Since then, various regulatory efforts have focused on removing barriers in cross-border securities clearing and settlement (First Giovannini Report), identifying required common regulatory standards and adequate regulatory/supervisory structures (Second Giovannini Report), creating an industry initiative developed by capital market service providers to self-regulate with respect to price transparency, interoperability and unbundling (Code of Conduct), and, in 2007, creating a common and harmonised regulatory regime for investment services in the 30 states of the European Economic Area through the Markets in Financial Instruments Directive (MiFID), which removed the ‘concentration rule’ in some countries that routed equities trading through the regulated incumbent exchanges and put in place the ‘best execution rule’, obliging the best execution for a customer.

**MiFID has substantially transformed the trading industry by increasing competition markedly and creating cost efficiencies for traders**, as well as reducing the market shares of incumbent exchanges significantly and almost across the board. Whereas incumbent exchanges used to have a national monopoly in their home markets, MiFID established a regulatory environment to encourage higher choice and increased competition and, importantly, to facilitate new market entry. Along with the 2006 ‘Code of Conduct’, which self-regulated the industry with respect to price transparency, interoperability and unbundling, this truly transformed the trading and post-trading industry along various dimensions, as multiple impact studies have since shown. The comprehensive database provided by the European Commission and Oxera study<sup>49</sup> helps put these cost developments into perspective. Along the value chain, the costs created by trading platforms amount to approximately 1% of the total costs for trading in Europe, when costs for global custodians, fund managers and brokers are included. Even when the pre-trade costs for fund managers are excluded, the share of total costs incurred by trading platforms amount to only 4.5%. These costs – 16 bp in total for trading and post-trading – mainly arise in the trading (11bp) of securities, whilst clearing and settlement (1bp) and custody (4bp) account for a smaller share of total costs, particularly when compared to the 75bp accounted for by pre-trade fund management.

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48 Lamfalussy Report by the Committee of Wise Men (2001). *The Regulation of European Securities Markets*, p. 16

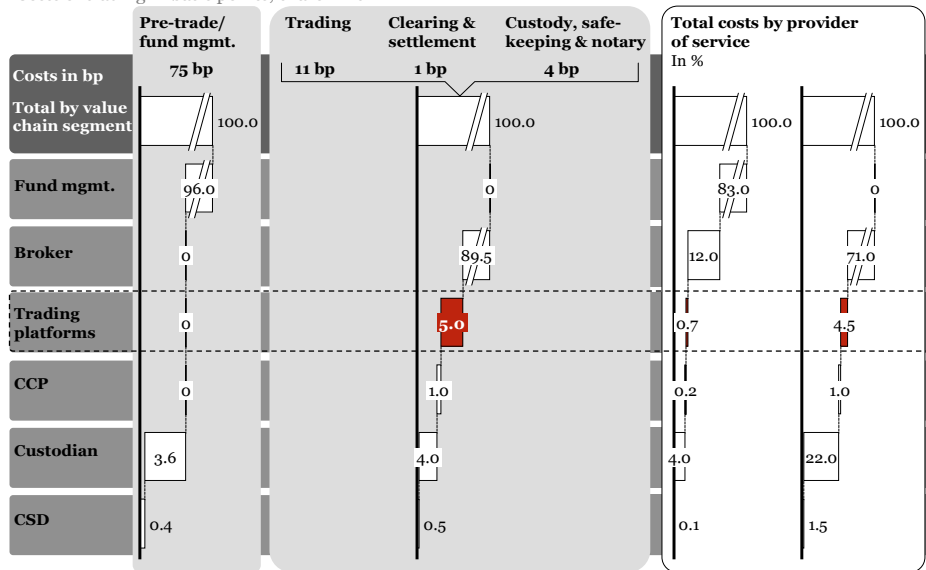
49 Oxera for the EU Commission (2011). *Monitoring prices, costs, and volumes of trading and post-trading services*.

FIGURE 13

**Trading value chain and costs paid to providers**

2009 data measured using average commission rates by institutional brokerage firms  
 Costs of trading in basis points; share in %

APPROXIMATE VALUES



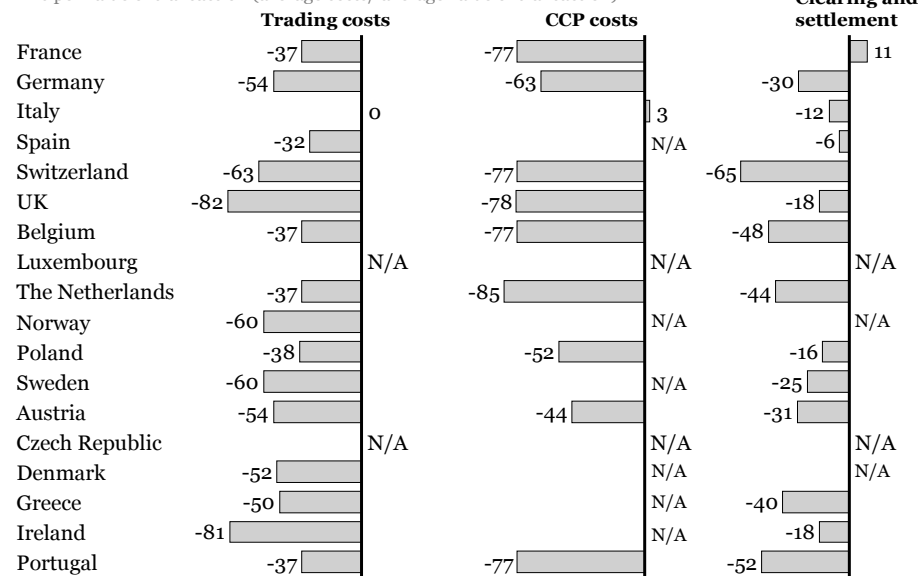
SOURCE: Author based on European Commission and Oxera study "Monitoring prices, costs and volumes of trading and post-trading services" (2011)

These cost figures already include a substantial degree of cost efficiencies achieved in the last years through a concerted policy effort aimed at increasing competition. These efforts have successfully reduced trading costs in the period 2006-2009, as analysed in detail by the European Commission and Oxera. Their data indicates that substantial costs reductions have been achieved along the entire value chain, from trading through central counterparty, down to clearing and settlement services. Although there is variation across countries, the overall pattern is remarkably clear: European trading and post-trading has become more competitive and cost-efficient – particularly in those countries with high trading volumes.

FIGURE 14

**Change in trading costs of on-book equities: 2006-2009**

In % per value of transaction (average costs/ average value of transaction)

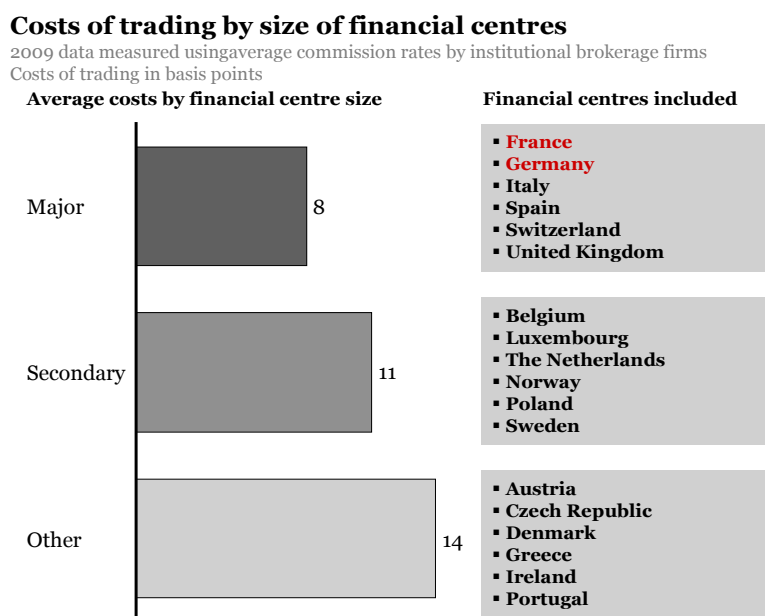


SOURCE: Author based on European Commission and Oxera study "Monitoring prices, costs and volumes of trading and post-trading services" (2011)



Nevertheless, cost reductions in trading and post-trading have also been and continue to be an important policy priority as the European market has grown in scale and become more integrated. The trading and post-trading industry is a fixed-cost business, where increased scale and liquidity are the key drivers for cost reductions.<sup>50</sup> This is obvious when looking at the Oxera data on financial centre costs by size. Larger and more liquid financial centres offer more competitive trading costs at 8bp, whilst the smallest centres have the largest trading costs. Moreover, relatively concentrated investors, whose choice of venue has been strengthened through MiFID, command high bargaining power over trading and post-trading venues.<sup>51</sup> As a result of increased scale and regulatory changes, costs along the trading value chain have fallen in recent years. Costs of equity trading, central counterparty services and clearing and settlement costs have fallen substantially across the various European financial centres in the period 2006-2009. A study by London Economics (2010) for the City of London finds that European financial market integration has successfully added 0.8% to 0.9% of economic activity to GDP.

FIGURE 15



SOURCE: Author based on European Commission and Oxera study "Monitoring prices, costs and volumes of trading and post-trading services" (2009)

However, **some financial integration challenges still remain.** Firstly, MiFID means that the **fragmentation have prevented trading cost and liquidity benefits from being realised in full.** Studies confirm that liquidity fragmentation has resulted in two ways:<sup>52</sup> Firstly, liquidity is now dispersed across various locations, including regulated markets (RMs), multilateral trading facilities (MTFs), dark pools and OTC markets, causing a fragmented market structure. Together with new trading technologies, this has led average trade sizes to decline. Gresse (2010) adds that such fragmentation in market structure correlates negatively with market depth and

50 For a comprehensive more micro-economic analysis of the economics of cash trading and post-trading see Marco Pagano and Jorge Padilla (2005). The Economics of Cash Trading: An Overview.

51 Ibid.

52 Gomber and Pierron (2010). MiFiD – Spirit and Reality of a European Financial Markets Directive.

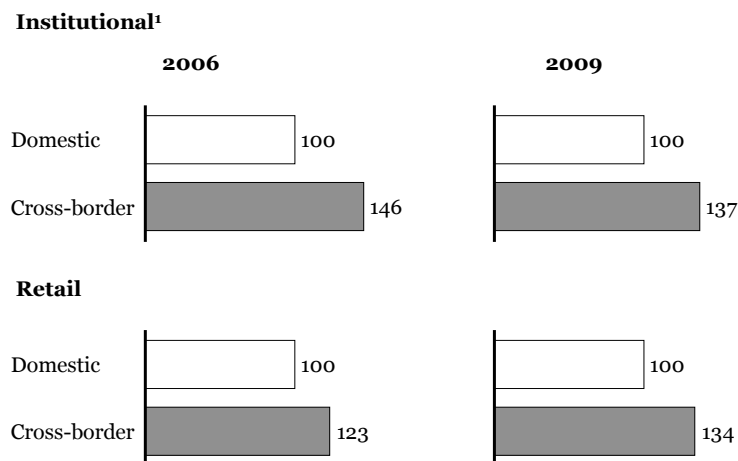
price quality, i.e. some benefits of additional scale cannot be realised.<sup>53</sup> Thus, there are adverse illiquidity and price inefficiency effects that result from a more fragmented market structure – a natural corollary of the pro-competition policy efforts that have also yielded the very cost benefits discussed above.

Secondly, another fragmentation challenge remaining is the fragmentation of European markets along national lines. This is evidenced by the fact that **cross-border costs of trading have not yet exhibited the same decline as domestic trading costs due to the attendant lack of pan-European scale of exchanges**. The most recent data in the study by Oxera and the European Commission show that cross-border trading costs from the investor’s perspective in 2006 were 46% higher for institutional investors and 23% higher for retail investors relative to domestic trading costs. In 2009 these costs were still 37% higher for institutional investors and 34% higher for retail investors. Of course there are many drivers of these relative cost differences along the value chain, including taxes, scale, variation of costs across financial centres, and not least the way that cost savings are forwarded to investors by brokers. Nevertheless, the residual difference due to differences in trading and post-trading costs constitutes another indication of a lack of pan-European consolidation. In the derivatives market, the challenges of fragmentation that arise from the high volumes of derivatives that are traded over-the-counter mainly materialize in terms of intransparency, instability, and price discovery inefficiencies and have, hence, been discussed already in the stability context (see Section 3).

FIGURE 16

**Costs of domestic and cross-border transactions from the investor’s perspective**

2006 and 2009 transaction costs compared (100 = domestic transaction cost)  
In %



<sup>1</sup> Major financial centres in Europe only; based on costs for the customer as charged by brokerage firms

SOURCE: Author based on European Commission and Oxera study “Monitoring prices, costs and volumes of trading and post-trading services” (2011)

53 Gresse (2010). Multi-Market Trading and Market Quality.

What is true for the European cross-border market is all the more valid for the integration of the transatlantic financial market. As noted in a Deutsche Bank Research paper, the **integration of what are still the two largest trading markets promises substantial welfare benefits, but has been lagging**. As such, the combined values of capital flows and trading are ‘primarily synthetic figures, which do not reflect the extent to which financial markets on the two sides of the Atlantic are effectively interwoven, how easily capital can flow between them, and whether bilateral financial transactions can be executed efficiently in the light of the integration of markets and infrastructure.’<sup>54</sup>

In summary, the major challenge ahead remains the double fragmentation of the European and the incomplete integration of the European and transatlantic cross-border trading and post-trading market. The root cause of this situation is that **consolidation of the exchange industry has begun but has not yet been completed**. Thus, the market has yet to catch up so that it can leverage in full the potential benefits of integration that policy-makers have enabled and realised for the domestic trading business in particular. However, exchanges have incentives to drive consolidation in their pursuit of ‘economies of scale and scope and network externalities’, as Schmiedel and Schönenberger note, accelerating what they call ‘the need for more integrated and efficient infrastructure, comprising exchanges, trading platforms and electronic networks, and clearing and settlement facilities at both the global and the domestic level.’<sup>55</sup> The next section analyses the extent to which the merger can contribute to this necessary consolidation and integrated infrastructure, and how this is likely to affect the integration, cost-efficiency and harmonisation of the European securities market.

## 4.2 Impact of the Merger: Consolidating European Markets

The **merger provides an opportunity to consolidate the European market through the creation of a large pan-European player with enhanced depth and liquidity in trading and scale in clearing and settlement**. The consolidation of the global trading market has proceeded in different waves, and has now regained momentum. This is the case not only in trading, but also in the European clearing and settlement industry, which is now seeing merger activity (e.g., LSE bid to take over LCH Clearnet), as ‘unlike the US counterpart, the European clearing and settlement industry is fragmented and, from an IT infrastructure perspective, unconnected.’<sup>56</sup> Since the main contribution of the merger towards financial integration, efficiency and harmonisation will lie in consolidating the landscape, a short economic definition of the terminology is in order. In a very comprehensive ECB Occasional Paper on this very topic, Schmiedel and Schönenberger define consolidation as ‘the process of concentration in the trading, clear-

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54 Steffen Kern, Deutsche Bank Research (2008). EU-US financial market integration – a work in progress. EU Monitor 96. Financial Market Special.

55 Heiko Schmiedel and Andreas Schönenberger (2005). Integration of securities market infrastructures in the euro area, p.8

56 Price Waterhouse Coopers (2011). Trading blocs What next for the stock exchanges?.

ing and settlement industry. It concerns not only structural aspects such as mergers and acquisitions, but also outsourcing, alliances, joint ventures and reorganisations within financial institutions.<sup>57</sup> The relevance of mergers for the integration of securities markets thus stems from its consolidation effect, which ‘not only facilitates integration, but may also help to reduce the cost of trading, clearing and settlement, by making use of scale economies and network externalities’, as the authors find.<sup>58</sup> Thus, as the historically very national and fragmented markets are now being integrated horizontally, cross-border mergers such as the DBG-NYSE Euronext merger – which were overdue because the financial crisis delayed this consolidation effort – are the key drivers.

The consolidation effect will be analysed in the following in terms of its horizontal, i.e. the merging of trading platforms and trading volumes, and vertical dimensions, i.e. the effects on related post-trading business in clearing and settlement. Lastly, this largely European perspective will also be complemented by a view of the merger in the context of the lagging integration of the transatlantic financial markets.

**Horizontal consolidation in trading will mainly impact markets through the enhanced scale and liquidity realised by the new entity** across various asset classes. In both equity and derivatives trading, this will create the deepest European trading platform in terms of turnover, as measured against 2010. In bond markets, it will create an additional deep platform, although it will lag behind the London Exchange and the BME Spanish Exchanges in third place in terms of volume. Investors will have an opportunity to benefit from these larger trading volumes in domestic but – importantly – also in cross-border trading, which historically has led to tangible cost reductions for traders as well. Thus, given the historically very positive effect of consolidation and integration, as outlined above, there is no reason to expect that this merger will trigger any detrimental effects. The cross-border nature of this transaction and the enhanced ability of the merged entity to attract more global trading and post-trading volumes could extend these cost reduction benefits to the increasingly important segment of cross-border trading and post-trading transactions.

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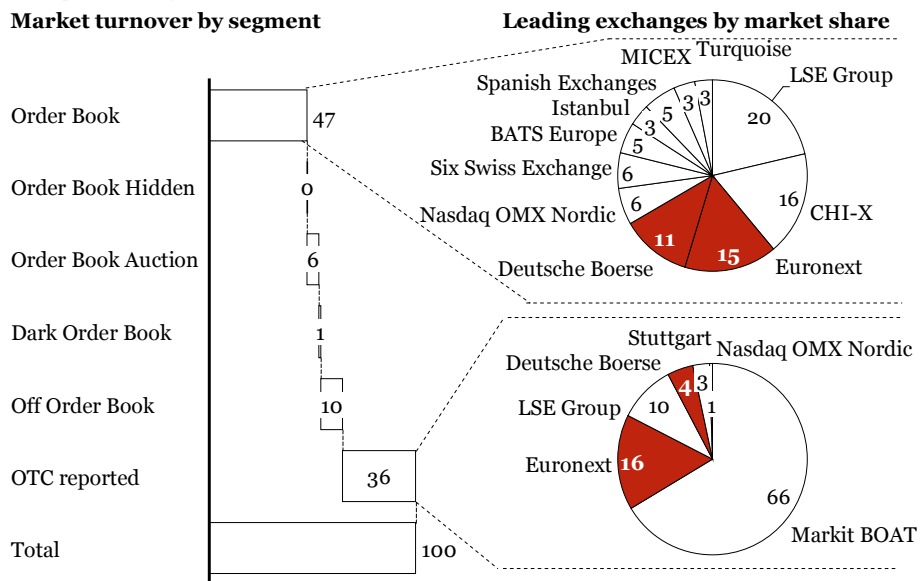
57 Heiko Schmiedel and Andreas Schönenberger (2005). Integration of securities market infrastructures in the euro area, p. 7

58 Ibid, p.7

FIGURE 17

### European equity market overview: Segments and key players

2010 equities trading turnover data; in % of total



SOURCE: Author based on Thomson Reuters and World Federation of Exchanges data

A highly specific and somewhat indirect consolidation effect relates to what could be termed the creation of a benchmark yield curve in interest rate derivatives. By integrating the European derivatives trading volumes, the new merger will moreover become the major player for futures and options in Europe and a major player globally. The very complementary businesses in the interest rate derivatives segments, with Deutsche Börse's Eurex active mainly in the long end, and NYSE Liffe mainly in the short end, could result in an integrated yield curve benchmark for European markets. The importance of benchmarks for price discovery and efficiency in securities markets has been analysed by the Bank for International Settlement's Philip Woolridge.<sup>59</sup> He spells out an important criterion for benchmark yield curves, namely that 'the term structure should at any given time represent the market's current expectations of future short-term interest rates. In other words, no factors other than expected future spot rates should systematically affect forward interest rates.'<sup>60</sup> As such, the consolidation of interest rate derivatives allows for comparable levels of liquidity and depth, which would ensure that no factors (e.g. differing liquidity) other than fundamentals would affect the values of these listed exchange-traded interest rate derivatives, thus facilitating price discovery.

**Consolidation through the merger of DBG and NYX also has a vertical dimension**, as Deutsche Börse has developed and maintained an integrated model that integrates trading with the clearing and settlement functions. However, this particular merger will probably have less of an impact in this area, since NYSE Euronext does not operate cash trading clearing services in cash equity clearing. However, this issue is still being debated contentiously, as the integrated

59 Philip Woolridge (2001). The emergence of new benchmark yield curves. BIS Quarterly Review.

60 Ibid, p.49

model has two effects, as noted by Pagano and Padilla<sup>61</sup>: It can create additional barriers to entry, as it takes a high level of investment, significant scale and network economies to compete with existing integrated models. On the other hand, there are significant efficiencies that result from these integrated models, as these same effects create natural cost efficiencies through additional volumes, which can then be passed on to end users as well reducing transaction costs significantly. Moreover, and this seems to be the particular benefit of consolidation in the clearing and settlement business, cross-margining opportunities will enable substantial capital savings. Cross-margining offers the opportunity to reduce margin requirements for related securities classes due to the recognition of reduced risks that come from offsetting open positions, which were previously cleared at different locations by different clearing houses. This clearly helps to economise on the collateral and capital employed and will likely be a major consolidation benefit in the post-trading market.

Thus, other derivatives clearing houses have adopted a strategy of vertical integration to realise these benefits, including CME Group, NASDAQ OMX, ICE, ASX/SFE and the Hong Kong Exchange, to mention only a few. Given these efficiencies, there seems to be a strong case for consolidation in this market as well. The particular gains will, of course, have to be weighed against competition concerns by the relevant authorities and are not subject of this section.

Beyond the consolidation and integration of the European market, the **merger might provide some new momentum towards the very lagging integration and harmonization of the transatlantic financial market**. As EU-US transaction volumes have been increasing in the last years, convergence in market structure and integration through more seamless trading using integrated platforms would be beneficial. The integration of these financial markets has been estimated to potentially lower transaction costs by up to 60%, to increase securities trading by 50% and to cut equity costs for linked companies by 9%.<sup>62</sup> Deutsche Bank Research builds on these efficiency gain assumptions and calculates that, based on the 2008 trading figures, these benefits would amount to approximately USD 48 billion in cost savings, which could mobilise additional trading volumes of as much as USD 10 trillion per year, measured against a total volume of USD 21 trillion in 2008.<sup>63</sup> However, achieving these benefits demands the removal of the obstacles deriving from differences in regulation and infrastructures, which still inhibit the full integration of the two largest trading markets globally. In this respect, the merger can only make be considered a first market-side development that regulators could build on. Nonetheless a transatlantic platform would be required if policymakers want to advance the harmonisation and convergence through more seamless IT platforms, standardisation of products and integrated offerings. In that sense this platform is a pre-requisite for eventual regulatory convergence – even though this will remain a distant objective in the political arena. Of course, the merger will not realise these effects in full by itself, but it is clear that any move towards

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61 Marco Pagano and Jorge Padilla (2005). The Economics of Cash Trading: An Overview.

62 Benn Steil (2002). Building a transatlantic securities market. Council on Foreign Relations.

63 Steffen Kern, Deutsche Bank Research (2008). EU-US financial market integration – a work in progress. EU Monitor 96. Financial Market Special.

transatlantic harmonisation to capture these enormous welfare gains will require the integration efforts of key market makers such as Deutsche Börse and NYSE Euronext.

**There could be similar consolidation benefits for issuers using the new entity.** Given the additional reach, the new entity might leverage the additional capital raising opportunities through more global access. This benefit will accrue to both sides, but of course NYSE Euronext is already the market leader in terms of global listings, which implies that the effect appears to be more significant for Deutsche Börse's European listed companies. Moreover, this ability to utilise access to global capital markets comes at a time when cross-listings have decreased for years, as it has been shown that cross-listings have limited value in terms of liquidity enhancement.<sup>64</sup> The experience of the NYSE-Euronext merger shows that the opportunity to cross-list in Europe has only been taken up by 10 US companies to date.<sup>65</sup> The differences in the legal framework make listing across countries a relatively costly undertaking. Thus, the ability to gain access to global exchange markets through a globally present brand without having to register under the rules of another country, and without having to comply with different reporting standards, is expected to be the particular benefit in this case, rather than the opportunity to actually cross-list.

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64 Richard Dobbs and Marc H. Goedhart (2008). Why cross-listing shares doesn't create value. McKinsey on Finance No. 29, Autumn 2008.

65 Neil Stewart (2011). Exchange mergers: good, bad or neutral?. Inside Investor Relations Article dated 18 February 2011. Article online 12 July 2011.

# 5 Financial Centre Competitiveness

## 5.1 Baseline: The Rise and Fall of Global Financial Centres

In the context of policy decisions related to merger, **exchanges have often been seen as symbols of national financial centres, their competitive standing and even their sovereign national economic interest.**<sup>66</sup> Policymakers have voiced various concerns in relation to the DBG NYX Euronext merger in the context of financial centre competitiveness. **These concerns are predicated upon three assumptions**, which this study wants to address: Firstly, one needs to assume that **exchanges matter for their respective financial centre location**. Secondly, there is the (implicit) assumption that the **financial centres in Europe affected by this merger are currently in a position of strength and on a trajectory of growth**, and thus have to fend off foreign influences (e.g., through merging exchanges) that could endanger that. Thirdly, it is assumed that the **creation of a consolidated, more internationally oriented merged entity will have purely negative effects** (mainly in terms of employment) **on national financial centres**, which result from the realization of synergies between the merging entities with benefits accruing to shareholders. Regarding the first assumption, this study takes the approach that while this link is indirect, since employment and value added of exchanges are only a fraction of total financial centre value added, some intangible benefits deriving from exchange brand and proximity and agglomeration benefits do exist. However, certainly the second assumption is unsustainable while the third assumption is least incomplete in the face of the facts. The evidence will be presented in the following.

Financial centres contribute to the economies in which they are embedded in two distinct ways. Firstly, they *directly add value* as they create high-paying jobs, generate taxes, and ensure employment in related financial and professional services. Secondly, and arguably more importantly, they create financial functions and markets that *indirectly add value*: These markets created in financial centres channel investments, provide funding to small and medium-sized enterprises, provide risk management and help to smoothen consumption throughout volatile times<sup>67</sup>, and contribute to financial stability at large.<sup>68</sup> Since **exchanges create and facilitate these market activities through the provision of trading platforms** and related services, they are at the heart of every leading financial centre. Beyond that market-making role, the **direct**

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66 The national interest argument was for instance cited as decisive by Australian authorities in their rejection of the Singaporean bid for the Australian exchange but has also been a key element of the debate on the merger of NYSE and Euronext.

67 On the role of markets (vs. intermediaries) in smoothing out consumption over time see Franklin Allen and Douglas Gale (2001). *Comparing Financial Systems*. MIT Press.

68 For an extensive discussion of this wider significance of financial centres to the European economy, see a recently published study on this topic: Europe Economics (2011). *The Value of Europe's International Financial Centres to the EU Economy*.



**impact of exchanges on financial centres is somewhat limited, but there is an indirect link that can be analyzed. All conceptualisations of the contribution of exchanges to the respective financial centres' competitiveness point to their indirect role in the attraction of important agglomeration factors.** Faulconbridge et al. (2007) look at the role of geographic factors around exchanges that boost competitiveness of financial centres and identify product complementarities, the nature of local epistemic knowledge communities, and regulation as important linkages that, despite the virtualization of trading, still matter.<sup>69</sup> Comprehensive competitiveness studies conducted by the City of London<sup>70</sup> and the City of New York<sup>71</sup>, respectively, concur that the agglomeration of talent, smart regulation, the presence of good customers and a competitive banking system, as well as the overall context all matter in defining competitiveness. Exchanges make a small direct contribution through their own employment and value added but a larger indirect contribution to the financial centre context as their presence in terms of defining branding, attracting regulators to locate in proximity, and agglomerating related financial services and customers. In this sense, **the presence of a leading exchange contributes to these dimensions in defining the respective competitive profiles of European financial centres.**

As financial globalisation and the attendant intensifying competition among financial centres have brought about the consolidation of European exchanges (see above), the impact of the exchange merger on the competitiveness of European financial centres has become a natural key concern for national and European policy-makers alike. Interestingly, media reports have highlighted a paradox in the debate: Whilst representatives of London's financial centres have expressed worries about the decline of London as a financial centre due to a rebalancing in favour of Frankfurt, similar concerns about a potential decline of Frankfurt as a financial centre in the new merged entity have been voiced on the German side.<sup>72</sup> What is evident from these contradictory concerns is that there is a clear need for a fact-based assessment of the relative competitive positioning of the European financial centres, given the trends in global competition as well as the specific impact of the merger on European financial centre competitiveness. This section examines these issues.

As shown below, the **globalisation of the financial centre landscape and the rise of Asian financial centres have triggered the relative decline of Western financial centres, in particular of continental European financial centres** such as Frankfurt and Paris. To avoid being relegated to the status of regional and specialised financial centres, these centres will require access to liquid and deep global exchanges. In this context, the DBG-NYX merger can be seen as an op-

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69 Faulconbridge et al (2007). Analysing the Changing Landscape of European Financial Centres: The Role of Financial Products and the Case of Amsterdam.

70 City of London (2008). Winning in a Changing World: Review of the competitiveness of London's financial centre.

71 City of New York (2007). Sustaining New York's and the US' Global Financial Services Leadership.

72 James Quinn in the Telegraph (2011). Stock exchange mergers: the fight for global dominance. 13 February 2011.

portunity to advance the competitiveness of the affected European financial centres because it will contribute to talent attraction, internationalisation and the sustained presence of a competitive and stable banking system.

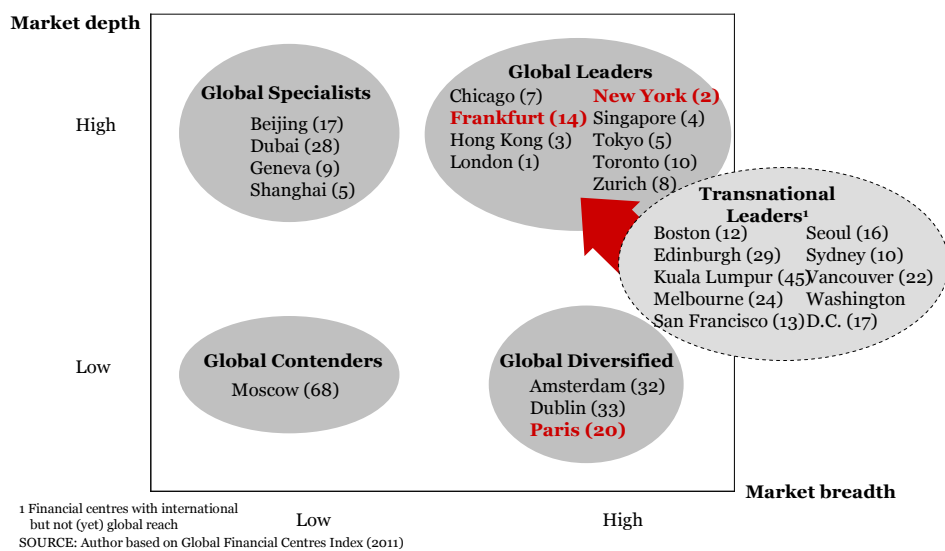
The globalisation of capital markets has redefined competitiveness for financial centres in more international terms. As such, the Global Financial Centre Index (GFCI)<sup>73</sup> produced by the Z/Yen Group defines financial centre competitiveness in terms of

- **Connectivity:** ‘The extent to which a centre is well known around the world and how much non-resident professionals believe it is connected to other financial centres.’
- **Diversity:** ‘The breadth of industry sectors that flourish in a financial centre.’
- **Specialty:** ‘The depth within a financial centre of the following industry sectors: asset management, investment banking, insurance, professional services and wealth management.’<sup>74</sup>

FIGURE 18

**Financial centre positioning vis-a-vis other global centres**

Points on y-axis based on approx. 2,000 financial practitioners at banks, asset managers and hedge funds, as well as other competitiveness indices (for more information see Global Financial Centre Index)  
Global ranking in brackets: Centre (2011 rank)



A modern, internationally competitive exchange is a contributing factor (by no means the only one though) towards a financial centre’s competitiveness along these three dimensions. By enabling access to deep and liquid global securities markets, it increases connectivity and gives diverse and specialised industry sectors access to innovative capital market services. The position of the leading global financial centres that distinguishes them from leading transnational

73 The GFCI is compiled semi-annually on the basis of two thousand interviews with financial practitioners.

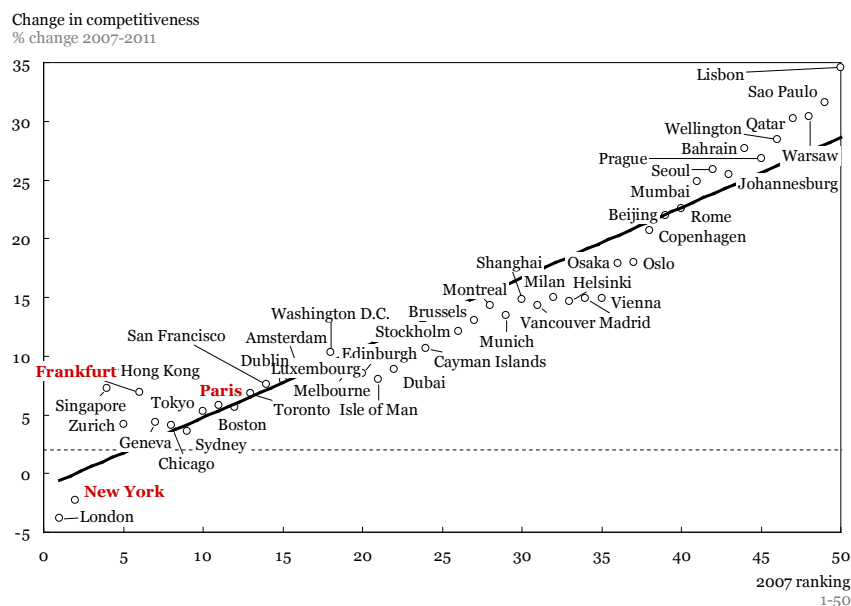
74 Global Financial Competitiveness Index 9 (2011), p. 8.

or regional financial centres can thus be defined in terms of their depth and breadth of access and trading in the key asset classes, as shown by the Figure above.

The globalisation of finance and the integration of emerging market financial centres with the global capital markets have released competitive forces that are redefining this global positioning game at an unparalleled speed. As a result, **former national and regional exchanges and related financial centres are challenging the leading financial centres' positions through various expansion strategies and concerted policy efforts**, including large-scale exchange mergers and partnerships. A **clear catch-up race has become evident in the last 5 years**, and this appears to have accelerated because of the financial crisis. When the pre-crisis ranking of financial centres in 2007 is compared with *absolute improvements in competitiveness*, a clear pattern emerges: The lower (higher) the financial centre was ranked in 2007, the more (less) it has been able to improve its competitiveness since then. This clear and significant catch-up pattern is certainly a well-known phenomenon in other spheres of economic development. It shows that the most relevant drivers of competitiveness from the viewpoint of market-participants seem to have improved relatively in those countries. The leading drivers are the stability and clarity of regulation, the quality of staff, taxation, IT infrastructure, costs, and market access. It also shows that globalisation of financial centres is a real phenomenon that has started challenging the established centres of the Western world, and of Europe in particular, in the past few years.

FIGURE 19

**Catch-up in competitiveness of financial centres 2007-2011**



SOURCE: Author based on Global Financial Centres Index (2007-2011); see DB Research for a similar finding and significant correlation figures

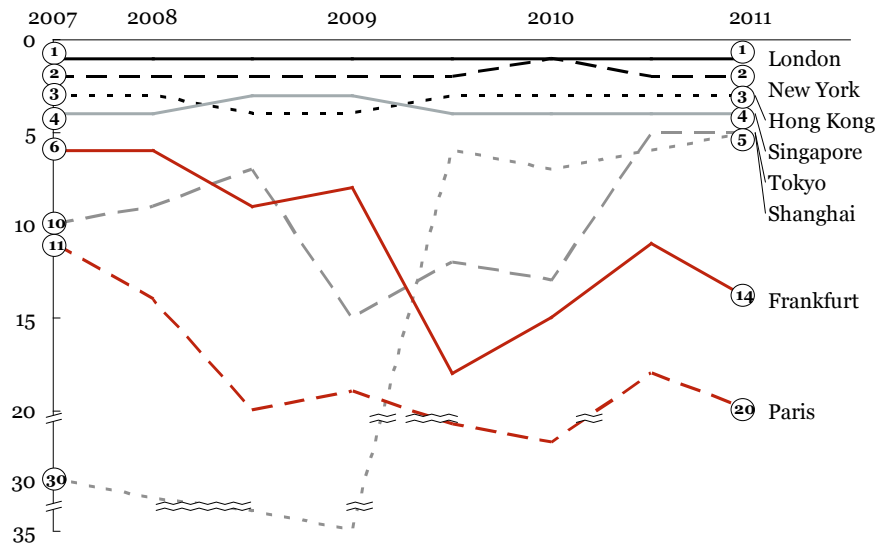
Whereas London and New York continue to lead the global rankings with their highly competitive offerings in asset management, banking and related professional services, large Asian metropolises such as Hong Kong, Singapore and Tokyo that have managed to narrow the competitiveness gap significantly in recent years have become closer contenders. More remarkably

though, the shift towards established and emerging Asian market financial centres is evident from the rise of Tokyo and Shanghai from ranks 10 and 30 to joint 5th place.

FIGURE 20

**Rankings of financial centre competitiveness: Global centres**

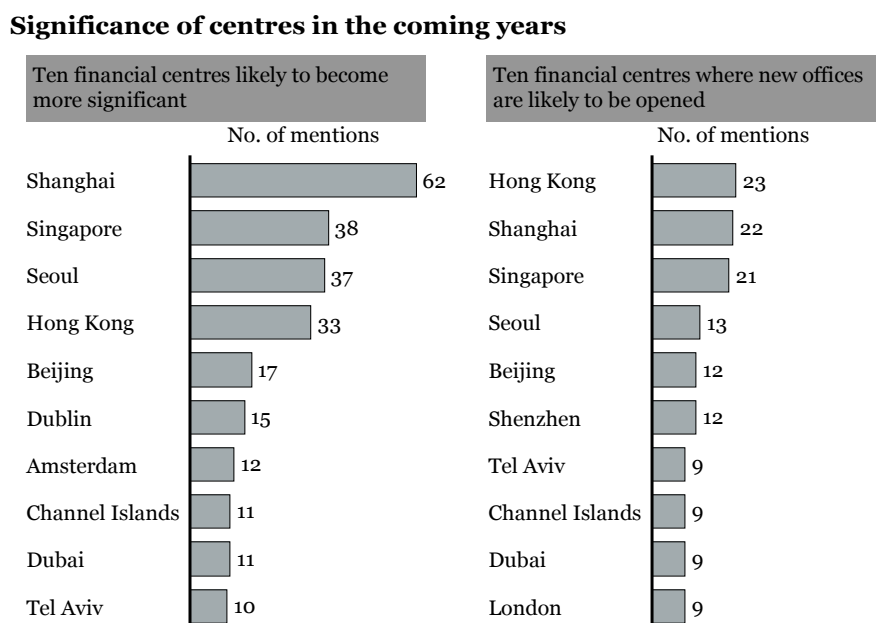
2007 - 2011 Global Financial Centre Index Rankings



SOURCE: Author based on Global Financial Centres Index (2007-2011)

The recent trend has been for **established European financial centres, particularly in the last 4 years, to have been in relative decline from positions of strength.** They have lost ground to the international competition, as Europe has not yet sufficiently consolidated its fragmented and specialised offerings to create a genuine pan-European exchange. In plain terms, the Asian financial centres' gain has been the continental European financial centres' pain. In 2007, Frankfurt and Paris still occupied ranks 6 and 11 in the GFCI index. In 2011, Frankfurt and Paris have surrendered these positions, dropping to ranks 14 and 20 respectively. Moreover, they are now followed closely by the upcoming exchanges in Shenzhen, Seoul, and Beijing, in ranks 15-17, which are catching up quickly and set for further growth as their breadth and depth rises with further expansion and consolidation efforts. **These trends are bound to continue, as international executives name only two European cities amongst the financial centres that they expect to continue becoming more significant** (Dublin and Amsterdam). This can also be expected to have real effects on employment growth, since it is largely these very centres where executives expect new offices to be opened – only London makes it into 10th place as the sole European city in this list (see Figure 21).

FIGURE 21



SOURCE: Global Financial Centres Index (2011)

Against this backdrop of financial centre competition, **the presence of broad, liquid exchanges with a global reach has become a crucial asset for financial centres.** To remain competitive in the face of increased international and domestic competition, large cross-border mergers and acquisitions involving exchanges have driven the consolidation of the global exchange landscape in recent years. The result of this exchange consolidation game can be expected to significantly shape the outcome of financial centre competition. An August 2011 study by PricewaterhouseCoopers fittingly states that ‘consolidation among Western exchanges may be moving to the end game, with the focus of future activity shifting towards emerging markets.’<sup>75</sup> The study finds that the **impact of this ‘end game’ on national financial centres will largely be determined by the ability of national exchanges to internationalise and diversify into the growing markets** of the BRIC countries: ‘Many Western companies are seeking to list in these markets, recognising the importance of accessing their growing capital bases. In turn, US and European groups could face the prospect of becoming the targets for acquisition rather than the acquirers. However, at present the supporting infrastructure of expertise and technology in London, New York and other leading Western financial centres still gives them a powerful edge in the global marketplace.’<sup>76</sup> Market actors such as the LSE Group’s CEO Xavier Rolet express similar thoughts about the role of the ongoing merger activity: ‘In five years there’ll be three to four international exchange groups with global distribution capabilities.’<sup>77</sup>

This global competition race between financial centres is driven by strong global structural trends such as the increase in cross-border capital mobility and velocity, factors that will not

<sup>75</sup> Price Waterhouse Coopers (2011). Trading blocs: What next for the stock exchanges?. Report released August 2011.

<sup>76</sup> Ibid, p. 3

<sup>77</sup> Reuters (2011). Interview with Xavier Rolet, 23 February 2011.

diminish. Hence, consolidation will likely continue and produce a handful of leading exchanges that will benefit the financial centres in which these exchanges are located. When analysed in this global context, only two alternative strategies for European exchanges and financial centres emerge as viable options in the global positioning game:

- **Regional niche players:** To offset declining revenues in cash trading, exchanges will have to become more local, specialised niche players serving the needs of small-cap domestic companies.
- **Global deep and broad players:** Exchanges will have to position themselves for growth in certain global market segments as part of a more international, diversified group.

The first option is the one that European exchanges (and their related financial centres) have been observing in recent years. This is where they have experienced relative decline, while those that have maintained their positions have largely become specialised and regional players (e.g. Dublin). How important positioning in high or low growth segments is and how it manifests itself in employment can be derived from an analysis of employment development at Deutsche Börse by segment. While Eurex, the derivatives trading segment of DBG, has been growing at almost 9% p.a. in recent years, employment in this segment has outpaced revenues with annualised growth rates of 20%. The same pattern can be seen for MD&A revenues and employment. This stands in stark contrast to Xetra, which has experienced negative growth of 8% p.a., leading to stagnating – and recently slightly declining – employment figures.<sup>78</sup> The following analysis will look at the second option's impact on financial centre competitiveness, something that this merger can facilitate through its contribution to enhancing the reach and depth of trading markets.

## 5.2 Impact of the Merger: Positioning Europe for Global Competitiveness

The *direct* and *indirect impact* of the merger on the competitiveness of the European financial centres affected can be captured in terms of the way that i) the relevant exchanges themselves, ii) investors and companies, as well as iii) the surrounding economy are affected. Such a comprehensive analysis is necessarily selective and the following overview will thus focus on the respective *key dimensions* of any impact from the perspective of financial centre competitiveness.

In terms of financial centre competitiveness, the affected exchanges will mainly be impacted in their positioning vis-à-vis the global competition. As Europe's relatively fragmented market landscape consolidates around an increasingly European market, the various **financial centres and exchanges are being driven to develop their respective global positioning and brands,**

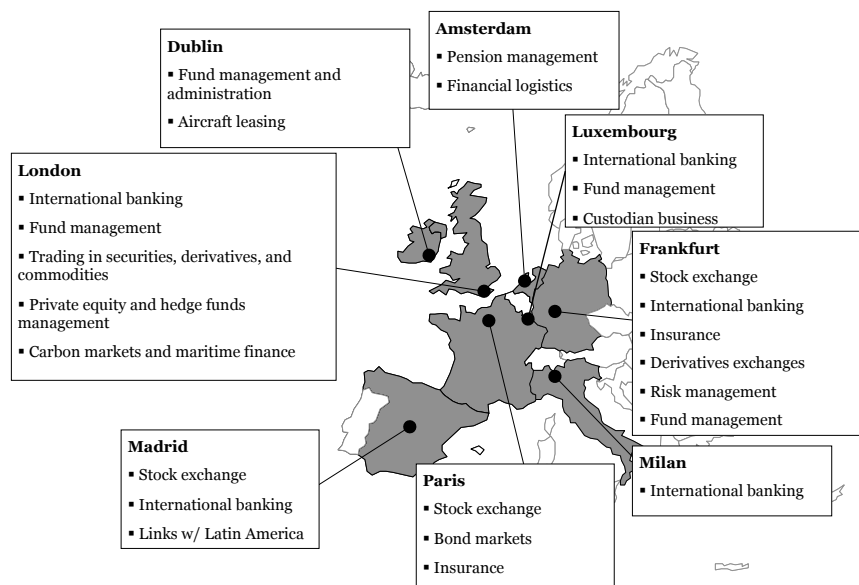
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<sup>78</sup> Author analysis based on revenue and employment data from respective annual reports from 2006 – 2010.

usually centred around certain asset classes and services, which in turn shape the perception of the financial centre as well. Economic rationale, strategic industrial policy and a certain degree of path dependence of the financial system have shaped the current structure of the exchange market and the positioning of financial centres over decades.<sup>79</sup> Whilst London is mainly known as an OTC derivatives hub, Frankfurt has taken the lead in regulated derivatives trading and post-trading. Paris is regarded as a leading venue in trading, Amsterdam in pension management, and Luxembourg has kept its strong position in asset management capabilities.<sup>80</sup>

FIGURE 22

### Selected areas of specialisation of European financial centres



SOURCE: Author based on Europe Economics Study "The Value of Europe's International Financial Centres to the EU Economy"

The two merger parties' strong brands in trading and post-trading are associated with these comparative advantages: For European markets those are Euronext for equities and NYSE Liffe for derivatives trading; Xetra for equities and Eurex for derivatives trading; as well as Clearstream for settlement and custody; plus numerous other brands for energy trading, fixed-income securities and settlement, administration and custody. The merger will necessarily realise additional returns from the comparative advantages resulting from investments made in the specialised expertise, technology and brands of the respective financial centres.

Moreover, the **new entity is likely to create European leadership in certain global growth markets such as the regulated trading of derivatives** and it could thus sustain a strong position with more global capital raising and cross-distribution opportunities in other businesses, such as cash trading or clearing services. The particular significance of the derivatives market for European financial centre attractiveness was already noted explicitly by the European Commission in its 1997 report on the impact of the euro on financial markets: '(...) Europe is a leading

79 For a historical political economy account of stock exchange and financial system development see Daniel Verdier (2002). *Moving Money: Banking and Finance in the Industrialized World*.

80 Europe Economics (2011). *The Value of Europe's International Financial Centres to the EU Economy*.

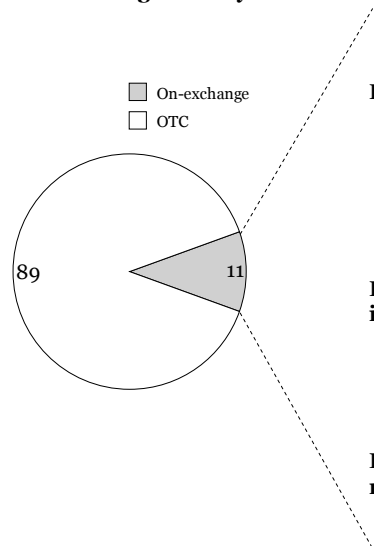
centre for this type of business. The EU's continued status as a leading centre for the world's financial community relies upon the existence of a flourishing derivatives market.<sup>81</sup> This positioning, in particular in the global derivatives market, is all the more beneficial and important today from a strategic industrial policy perspective, since revenues in the largely commoditised cash trading market have been declining in general, as a look at Deutsche Börse's revenue streams shows: While revenues from Eurex derivatives trading grew at an average annual rate of 9% between 2006 and 2011, Xetra revenues from cash trading declined by 2% in the same period. As competition has increased markedly in the equities trading business, DBG and Euronext are still leading trading venues. However, they only command 11% and 15% respectively of order book equities trading volumes, whilst competitors like Chi-X or the LSE take the lead with a market share of 16% and 20% respectively. It is of course in the European economic interest to sustain this degree of competition in the equities trading market to maintain competitive bid-ask spreads and transaction costs. At the same time, **European financial centres have to position themselves in the strongly growing global derivatives market to offset likely losses in revenues in cash trading.** Here, other global exchanges such as BM&FBOVESPA, Korea Exchange and CME Group have already taken the lead in the equity, equity index and interest rate segments, and have achieved significant market shares. The combined new group will surpass these market leaders only in equity derivatives, but will at least represent a strong competitor in equity index and interest rate derivatives (by outstanding amounts; see Figure 14).

FIGURE 23

### Global derivatives market overview: Market segments and key regulated exchange players

2010 derivative amount outstanding and volume; in % of total

#### Derivative segments by amount outst.



#### Leading exchanges by share of volume<sup>1</sup>

①	BM&FBOVESPA	16%
②	CBOE	11%
③	NASDAQ OMX	11%
④	Eurex	10%
⑤	ISE	9%
⑥	NYSE Liffe (Europe)	9%
	Other	35%
①	Korea Exchange	49%
②	Eurex total	11%
③	CME Group	10%
④	NSE India	9%
⑤	RTS	3%
	CBOE	3%
	Osaka SE	3%
	Other	11%
①	CME Group	43%
②	NYSE Liffe (Europe)	18%
③	Eurex	15%
④	BM&FBOVESPA	14%
	Other	9%

<sup>1</sup> Includes registered negotiated deals/ OTC that were traded on exchange for NYSE Liffe and Eurex  
SOURCE: Author based on BIS and World Federation of Exchanges data

81 European Commission (1997). The Impact of the Introduction of the Euro on Capital Markets. Communication from the Commission.



The **positioning of these exchanges and financial centres is not a matter of chance**, but rather the result of what could be called targeted (industrial) policy considerations. In the case of CME Group, for instance, the acquisition of the Chicago Board of Trade (CBOT) created a North American exchange force in derivatives to be reckoned with on a global scale. The transaction was approved by the US Treasury despite the dominant position domestically versus other exchanges.<sup>82</sup> Considering that 90% of derivatives volumes are actually traded OTC – a market for which both London and New York are positioned already – it becomes clear that the other **European financial centres will have to create a strong player in the global regulated derivatives market** to remain competitive and position themselves for further global growth. **This position in the derivatives market should reflect European stability attributes and aspirations:** The combined offering of such derivatives trading, coupled with a strong integrated presence in clearing and settlement – and thus related risk management services – offers an opportunity to position Europe, and in particular Frankfurt (from which derivatives will be managed in the new entity) as a **‘hub for financial stability’**. **With the presence of the European Central Bank, the European Systemic Risk Board and a leading global regulated derivatives trading and clearing infrastructure, Frankfurt would certainly be able to realise agglomeration benefits** in the area of talent attraction as well as training, expertise development and knowledge sharing – critical drivers for financial centre competitiveness, as described above.

Investors will mainly be affected by the merger through the resulting increase in liquidity. In an analysis of the Euronext merger impact on market liquidity, Nielsson (2009) distinguishes between three kinds of liquidity that a merger can enhance:<sup>83</sup> firstly there is market breadth, i.e. the larger number of investors trading in a particular company; secondly, market depth, meaning the larger quantity of shares available at a price marginally above and below the current market price; and thirdly, other factors easing trading, such as lower transaction costs, improved information and technological integration. This may be especially important in Europe, where Nielsson (2009) found transaction costs to be a multiple of those in the United States, and where the additional liquidity and trading volumes generated by the merger could lead to further benefits. Given these numerous ways in which mergers enhance liquidity and the empirical evidence he analyses, he concludes that there are few reasons why a merger could reduce liquidity. The merger can instead be expected to create significant liquidity increases as trading and clearing volumes in key asset classes grow (see Figure 24 below), and as harmonised interfaces allow investors to leverage efficiencies themselves.

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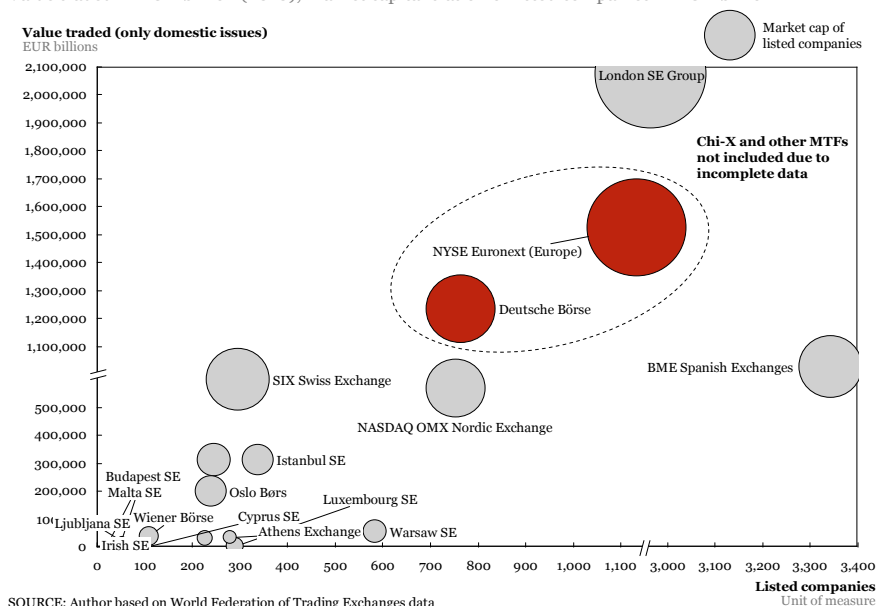
82 For a comparison of the U.S. and European assessment of mergers by leading derivatives players see Jeremy Grant (2011). Quick View: What next for DB-NYSE probe? Financial Times, 8 August 2011.

83 Ulf Nielsson (2009). Stock Exchange Merger and Liquidity. Journal of Financial Markets, Volume 12, Issue 2, May 2009, pp. 229-267.

FIGURE 24

### Combined European equity market breadth and depth

Value traded in EUR billion (2010); Market capitalisation of listed companies in EUR billion



SOURCE: Author based on World Federation of Trading Exchanges data

It is also important to spell out **the costs of exchange mergers for financial centres, in particular as they relate to short-term headcount reductions** resulting from the synergies obtained from harmonising infrastructure and personnel. Past mergers, such as the NYSE-Euronext merger, tried to downplay the negative employment effects (in this case on Paris). Looking at the numbers, however, it is evident that some employment reduction took place. This has created a natural scepticism on the part of policy-makers, employees and unions. Between 2008 and 2010, the headcount of the newly merged entity fell by around 20 per cent (789 out of an initial headcount of 3,757). Of severance payments made between 2008 and 2010, 62 per cent went to Europe (even if the published headcount reduction was roughly 50/50 between the US and Europe).<sup>84</sup> Analysis of the experience of very comparable recent mergers such as the CME Group acquisition of CBOT and, subsequently, of NYMEX indicates that these mergers also resulted in negative short-term effects in the order of 7-10% of headcount reductions.<sup>85</sup>

However, this **experience also shows that enhanced post-merger growth prospects do culminate in substantial high-value added employment increases, making the net effect much more positive than the short-term perspective would suggest.** For example, CME Group, with its strongly growing derivatives business has seen a 10% staff increase in the past year alone, more than offsetting the staff reductions in the previous year. A strong presence in growth segments such as derivatives clearly translates into revenue growth and attendant employment growth. The same pattern can be seen at Deutsche Börse (see above). Increased hiring is still happening in the most dynamic business areas that are likely to benefit most from the merger. Of the approximately EUR 400 million of cost synergies to be realised, it can be ex-

84 Author based on annual reports from 2007-2011.

85 Author based on annual reports from 2007-2011.

pected that there will be negative employment effects for those financial centres where the currently declining cash trading businesses are located. However, taking into account the overall changing landscape of the industry, there are very strong reasons to believe that this trend would have materialized in any case due to the highly competitive market environment and the commoditisation of these market segments. The merger might accelerate this, but it can also be seen as a pledge to generate growth benefits through leadership in the derivatives market, which can be expected to trigger an overall positive employment effect in the medium term.

To sum up, the position of strength and growth that DBG and NYX can achieve through their merger does not evidence large costs but if anything an **opportunity for European financial centres to reverse the global catch-up race in their favour**. A new transatlantic player with a presence in the major current European and North American markets, as well as a developing global footprint, increases the weight of European financial centres in the global competition for traditional asset classes, and especially in global growth markets such as derivatives. This will lift the standing of European financial centres, which in recent years – with the exception of London – have been moving towards the status of regional specialised players in the global trading industry. Clearly, there will also be short-term costs that mainly derive from the negative short-term impact on employment that the realisation of group-level synergies will entail. However, the enhanced growth prospects of the merged entity are likely to offset this in the medium term, as experience from the comparable Chicago Mercantile Exchange (CME)/Chicago Board of Trade (CBOT) merger shows.

## 6 Conclusion

The aim of this study has been to outline the impact of the DBG-NYX merger on European markets in terms of the three key policy dimensions that policy-makers have to assess in this context. Mergers of this scale and significance, spanning continents, must be evaluated from multiple policy perspectives that go beyond intra-European market share and efficiency considerations. Especially in light of the financial crisis, there are other policy areas such as financial stability and the global competitiveness of European financial centres that deserve the attention of policy-makers. Thus, given the necessarily partial scope of this analysis (excluding a detailed competition analysis of this merger) this study's main recommendation to policy-makers is to adopt a **comprehensive perspective when assessing the likely impact of the merger, addressing all the elements analysed in this study and identifying the main trade-offs**, so as to arrive at a balanced judgement in the best interests of competitive, integrated and stable European markets.

**The analysis presented here arrives at an overall positive assessment of the merger. In particular, it expects the merged entity to**

- (i) facilitate regulatory action with a view to enhanced financial market stability;**
- (ii) to have a positive effect overall on the competitiveness of the European exchange industry;**
- (iii) to be a step in the direction of further financial integration in Europe.**

This contributes to the consolidation of the European trading market and thus further enhances the functioning of the single market and the single currency.

## Glossary<sup>86</sup>

**Affirmation (of a trade confirmation)** A procedure in a confirmation process, whereby a single record of the trade is created by one party evidencing the full terms of the trade and the counterparty verifies and agrees to that record. Affirmation of trade confirmations is different from trade verification (also known as economic affirmation), which is limited to principal economic terms.<sup>A</sup>

**Allocation (of trades)** The decomposition of a block of trades by an investment manager into component sets of trades for individual clients of the manager.<sup>A</sup>

**Bilateral** Contract relationship between two market participants regarding trade, collateral and / or clearing agreements. Within a bilateral market organization all market participants have individually negotiated contract relationships with each other.<sup>C</sup>

**Bond** An instrument for borrowing funds on the capital market, where creditors' claims are vested/ securitized.<sup>P</sup>

**Broker** A company acting as an intermediary between buyers and sellers of derivatives or securities, effectively channelling orders to the market for execution. For this service, brokers charge a commission. Pure brokers only act as agents on behalf of the trading parties (see broker-dealer).<sup>D</sup>

**Broker-dealer** A broker also acting as buyer or seller to transactions and thus becoming a principal party to a deal (often in the form of market making). In the OTC derivatives segment, broker-dealers usually act as counterparty to end customers. As the broker-dealer – usually a large universal or investment bank – also assumes principal risk, commissions are higher than for pure brokerage.<sup>D</sup>

**Cash flow/payments settlement** The actual execution of cash movement for payments due.<sup>A</sup>

**Central bank money** Liabilities of a central bank that take the form of banknotes or of bank deposits at a central bank and which can be used for settlement purposes.<sup>B</sup>

**Central counterparty (CCP)** An entity that interposes itself between the counterparties to the contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer.<sup>B</sup>

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<sup>86</sup> This glossary is provided for the convenience of the reader. The definitions are not original work of the author of this study but were taken directly from standard documentation of the BIS, the ECB/CESR, the Group of Thirty, and the Deutsche Börse White Paper on Derivatives. The respective sources are referenced with the letter at the end of the quote, referring to the source list at the end of the glossary.

**Central counterparty (CCP) link** An arrangement between two CCPs that provides central counterparty services for trades performed between the participants of the two CCPs involved, without obliging those participants to become members of both CCPs.<sup>B</sup>

**Central data repository (CDR)** Platform where data on traded contracts is registered and post-trade recordkeeping on contracts is enabled. A repository provides information on, for example, the number and value of outstanding contracts, the size of counterparty risk or outstanding positions.<sup>D</sup>

**Central securities depository (CSD)** An entity that: 1) enables securities transactions to be processed and settled by book entry and; 2) plays an active role in ensuring the integrity of securities issues. Securities can be held in a physical (but immobilised) or dematerialised form (i.e. so that they exist only as electronic records).<sup>B</sup>

**Clearing/clearance** The process of transmitting, reconciling, and, in some cases, confirming payment orders or security transfer instructions prior to settlement, possibly including the netting of instructions and the establishment of final positions for settlement.<sup>C</sup>

**Clearing fund** A fund composed of assets contributed by participants in a CCP, or by providers of guarantee arrangements, that may be used in certain circumstances to settle transactions of a defaulting CCP participant and/or cover losses and liquidity pressures resulting from its defaults.<sup>B</sup>

**Clearing house** A central entity (or central processing mechanism) through which financial institutions agree to exchange transfer instructions for funds or securities. In some cases, the clearing house may act as central counterparty for the participants and therefore assume significant financial risks.<sup>B</sup>

**Clearing margin** Margin posted by a member of a clearing house.<sup>D</sup>

**Clearing member** A member of a clearing house. In a CCP context, a general clearing member clears on its own behalf, for its customers and on behalf of other market participants. Direct/individual clearing members clear on their own behalf and on behalf of their customers. Non-clearing members use general clearing members to access the system's services. All trades must be settled through a clearing member.<sup>D</sup>

**Closeout** Acceleration and termination of a contract prior to its maturity.<sup>D</sup>

**Close-out netting** A special form of netting, which follows certain contractually agreed events (such as the opening of insolvency proceedings etc), whereby all existing obligations are accelerated so to become immediately due.<sup>B</sup>

**Collateral** An asset or third-party commitment that is used by the collateral provider to secure an obligation vis-à-vis the collateral taker.<sup>B</sup>

**Collateralization** The use of collateral to secure a transaction. In the derivatives market, collateralization plays an important role to manage counterparty risk in the on-exchange (where collateral is pledged to CCPs) and OTC segments.<sup>P</sup>

**Credit default swap (CDS)** A derivatives contract to transfer the credit risk of underlying debt instruments (mostly bonds or loans). A CDS buyer receives credit protection. In the case of default, the buyer will be compensated by the CDS seller (the seller either has to buy the debt instrument at its face value or has to pay the difference between its face value and the reduced value in the case of default). In return for credit protection, the seller receives periodic payments from the CDS buyer.<sup>P</sup>

**Credit risk** The risk that a counterparty will not settle an obligation for full value, either when due or at any time thereafter. Credit risk includes replacement cost risk and principal risk. It also includes the risk of the failure of the settlement bank.<sup>B</sup>

**Cross-border trade** A trade between counterparties located in different countries.<sup>C</sup>

**Cross-border settlement** Settlement that takes place in a country other than the country in which one or both parties to the transaction are located.<sup>B</sup>

**Cross-margining agreement** An agreement between two CCPs which makes it possible to limit the margin requirements for institutions participating in both CCPs by considering the positions and collateral of such participants as one portfolio.<sup>B</sup>

**Cross-system settlement** Settlement of a trade through a link between two separate payment systems or securities settlement systems.<sup>B</sup>

**CSD link** A set of technical and legal arrangements between an investor CSD and an issuer CSD for the cross-system transfer of securities.<sup>B</sup>

**Custody** The holding and administration of securities and other financial instruments on behalf of others.<sup>B</sup>

**Custody risk** The risk of loss on securities in custody as a result of the custodian's insolvency, negligence, misuse of assets, fraud, poor administration or inadequate record-keeping.<sup>B</sup>

**Default** An event stipulated in an agreement as constituting a default. Generally, the failure to complete a funds or securities transfer in accordance with the terms and rules of the system. A failure to pay or deliver on the due date, breach of agreement and the opening of insolvency proceedings all constitute events of default.<sup>A</sup>

**Depository** An agent with the primary role of recording the (direct or indirect) holding of securities. A depository may also act as registrar.<sup>B</sup>

**Equities** Securities that are shares in a listed company or listed investment company.<sup>D</sup>

**Exchanges** A trading platform where securities are listed and trading takes place according to specified rules, providing a liquid market for trading.<sup>C</sup>

**Exposure** Potential maximum loss. In derivatives transactions, exposure can be broken down into two components: a) the current gross market value of the derivative, i.e. the amount that a counterparty would lose if the other counterparty defaulted today, and b) an add-on for potential future exposure to capture the risk of market value fluctuation.<sup>D</sup>

**Forward (contract)** A derivatives contract for the delivery or receipt of a specific amount of an underlying, at a set price, on a certain date in the future.<sup>D</sup>

**Future (or futures contract)** A standardized derivatives contract for the delivery or receipt of a specific amount of an underlying, at a set price, on a certain date in the future. Futures are traded on derivatives exchanges.<sup>D</sup>

**Governance** Procedures through which the objectives of a legal entity are set, the means of achieving them are identified and the performance of the entity is measured. This refers, in particular, to the set of relationships between the entity's owners, board of directors, management, users, regulators and other stakeholders that influence these outcomes.<sup>B</sup>

**Gross market value** The aggregate market value of several derivatives contracts calculated by summing up the positive market value of one side of each contract.<sup>D</sup>

**Indirect link** A link between two CSDs through an intermediary, whereby the two CSDs do not have any direct contractual or technical arrangement.<sup>B</sup>

**Infrastructure** Organizational structures needed for the financial market to function, e.g. exchanges, central counterparties or settlement depositories.<sup>D</sup>

**Initial margin** Minimum percentage of the purchase price that a client is required to pay for with his or her own cash or acceptable securities to his/her broker before the client can trade. For futures contracts, the initial margin is calculated based on a formula set by a central counterparty.<sup>B</sup>

**Interdealer-broker** An intermediary facilitating transactions between different (broker-)dealers in the OTC segment. In recent years, the interdealer-broker segment has significantly gained importance in the derivatives market and is now almost as large as the exchange segment in terms of revenues.<sup>D</sup>



**International central securities depository (ICSD)** A central securities depository (CSD) which was originally set up to settle Eurobonds trades and which is now also active in the settlement of internationally traded securities from various domestic markets, typically across currency areas.<sup>B</sup>

**Interoperability** Interoperability is achieved when the structure of systems or products allows them to be used in conjunction with other systems or products without imposing unnecessary costs on the users.<sup>A</sup>

**Interoperable systems** Two or more systems whose system operators have entered into an arrangement (including links) between themselves that involves cross-system execution of transfer orders. Such arrangement between two or more systems cannot be considered as a system itself.<sup>B</sup>

**Legal execution** The agreement by both parties of the written or electronic record of the full terms of a trade.<sup>A</sup>

**Legal risk** The risk of loss on account of the unexpected application of a law or regulation, or because a contract cannot be enforced.<sup>B</sup>

**Liquidity** Ability to buy or sell a security at any point in time and in large volumes without substantially affecting its price.<sup>B</sup>

**Liquidity risk** The risk resulting from an event that a counterparty does not receive liquidity as agreed. Liquidity risk does not imply that a counterparty or participant is insolvent, since it may be able to effect the required settlement at some unspecified time thereafter.<sup>B</sup>

**Margin** An amount for which highly liquid collateral is required in order to cover adverse market price movements.<sup>B</sup>

**Market maker** A financial intermediary that offers to buy and sell securities or derivatives by providing quotes on a continuous basis. Thereby it is assured that parties wanting to trade find a counterparty and liquidity is ensured. Large universal and investment banks often act as market makers (see broker-dealer).<sup>D</sup>

**Market risk** The risk of losses (in both on and off-balance sheet positions) arising from movements in market prices.<sup>D</sup>

**Marking to market:** The revaluation of open positions in financial instruments at current market prices and the calculation of any gains or losses that have occurred since the last valuation.<sup>A</sup>

**Matching** The process used for comparing the settlement details provided by the buyer and the seller of securities or financial instruments in order to ensure that they agree on the terms of the transaction.<sup>B</sup>

**MiFID** European Union directive on markets in financial instruments (MiFID) which harmonises the regulatory regime for investment services and activities within the member states of the European Union.<sup>D</sup>

**Multilateral netting** Netting on a multilateral basis is arithmetically achieved by summing each participant's bilateral net positions with the other participants to arrive at a multilateral net position. Such netting is often conducted through a central counterparty that is legally substituted as the buyer to every seller and the seller to every buyer. The multilateral net position represents the bilateral net position between each participant and the central counterparty.<sup>A</sup>

**Multilateral Trading Facility (MTF)** A public trading venue operated by an investment firm or a market infrastructure provider that brings together the buying and selling interests of market participants.<sup>D</sup>

**Netting** An agreed offsetting of mutual obligations by participants in a system. The process involves the calculation of net settlement positions and their legal reduction to a (bilateral or multilateral) net amount. Netting may take several legal forms.<sup>A</sup>

**Novation** Act of replacing a party to a contract with a new party. In the case of CCP-cleared derivatives, the CCP steps into the derivatives contract and acts as a buyer to all sellers, and vice versa. Thus, the CCP is the universal counterparty to all contracts.<sup>D</sup>

**Off-book trades** Trades that are not executed through an electronic order book or an exchange but confirmed through a system managed, directly or indirectly, by an exchange or MTF where both seller and buyer agree on the transaction (price and quantity). This system checks automatically whether the transaction is compliant with the exchange rules.<sup>D</sup>

**On-book trades** Transfers of ownership by way of trades executed through the electronic order book of an exchange or MTF, where orders placed by trading members are usually exposed to all market users and automatically matched according to precise rules set up by the exchange/ MTF and whose prices are displayed to the market. These trades may include floor trading organised by an exchange/ MTF.<sup>D</sup>

**Operational risk** The risk that deficiencies in information systems or internal controls, human error or management failures will result in unexpected losses (internal and external events).<sup>B</sup>

**Order** A contractually binding request to other market participants to buy or sell a specific quantity of a financial instrument at a defined price.<sup>D</sup>

**Over-the-counter (OTC)** A method of trading that does not involve an exchange. In over-the-counter markets, participants trade directly with each other, typically by telephone or computer links.<sup>A</sup>

**Plain vanilla transactions** Generally used to refer to a type of derivatives transaction with simple, common terms that can be processed electronically. Transactions that have unusual or less common features are often referred to as exotic, structured or bespoke.<sup>A</sup>

**Price discovery (function)** Process of finding the equilibrium price for assets and securities through the interaction of buyers and sellers within the market. Price discovery for exchange-traded financial instruments takes place continuously as bid and ask offers are channelled and therefore matched at all times.<sup>D</sup>

**Prime brokerage** The provision by firms (eg large securities firms) of credit, clearing, securities lending and other services to clients (typically hedge funds). In OTC derivatives transactions, prime brokerage refers to an arrangement that permits a customer (typically a hedge fund) to use multiple dealers to execute OTC derivatives trades while clearing and settling those trades through a single prime broker. For each trade, the prime broker becomes the counterparty to a deal with the customer and the counterparty to a deal with the executing dealer.<sup>D</sup>

**Reconciliation** A procedure to verify that two sets of records issued by two different entities match.<sup>B</sup>

**Registry** An entity that records the ownership of securities on behalf of the issuer.<sup>B</sup>

**Regulated market** A public trading venue that is subject to stricter regulation and supervision than multilateral trading facilities, e.g. rules for trading instrument admission, trade controlling and reporting.<sup>D</sup>

**Risk management** Identification and valuation of risks that are linked to a derivatives contract. The probability of events involving risk is then minimized and controlled.<sup>D</sup>

**Securities settlement system (SSS)** A system which permits the transfer of securities, either free of payment (FOP) or against payment (delivery versus payment).<sup>B</sup>

**Settlement** The completion of a transaction or of processing in a transfer system, such that participants meet their obligations through the transfer of securities and/or funds. A settlement may be final or provisional.<sup>B</sup>

**Settlement agent (settlement institution)** The institution across whose books transfers between participants take place in order to achieve settlement within a settlement system.<sup>B</sup>

**Settlement risk** The risk that settlement in a transfer system will not take place as expected, usually owing to a party defaulting on one or more settlement obligations. This risk comprises, in particular, credit risks and liquidity risks. <sup>D</sup>

**Settlement system** A system used to facilitate the settlement of transfers of funds, assets or financial instruments. <sup>B</sup>

**Spread** Absolute or relative difference between the bid and ask limit of the issuer's quote. <sup>D</sup>

**Systemic risk** The risk that the inability of one participant to meet its obligations in a system will cause other participants to be unable to meet their obligations when due, with possible spillover effects such as significant liquidity or credit problems that may threaten the stability of or confidence in the financial markets. The inability can be caused by operational or financial problems. <sup>B</sup>

**Transfer order** An order or message requesting the transfer of funds or securities from the debtor to the creditor. <sup>B</sup>

**Unwind** The process of recalculating obligations in some net settlement systems where transfers between the accounts of participants are provisional until all of them have finally discharged their settlement obligations. If a participant fails to settle, some or all of the provisional transfers involving that participant are deleted from the system and the settlement obligations of the remaining participants are re-calculated. <sup>B</sup>

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