Morgan Stanley

OLIVER WYMAN

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The Future of Capital Markets Infrastructure

Market infrastructure is on the cusp of change. The financial crisis propelled regulators worldwide to find ways to improve market transparency, reduce systemic risk and drive down trading costs through greater use of centralized clearing and electronic trading platforms. The timing of new regulation is unclear, but it is the most important driver of change in the industry. This joint Morgan Stanley-Oliver Wyman report investigates how the economics of the industry might evolve in response to regulatory and other changes, and who the winners and losers could be.

Consolidation gathering steam. Consolidation efforts are focused on exchanges and reflect margin and top-line pressure, especially in Europe, where competition and commoditization have shrunk revenues by 15% since 2008. Cost synergies (historically 10-15%) provide a clear logic for deals. There is also scope for product extension and geographic diversification, but delivery of revenue synergies remains to be seen. We expect any sector rerating will require belief in synergy delivery or improving top-line growth from a cyclical upturn.

What are the opportunities in OTC? Electronification of trading and clearing of OTC contracts present revenue opportunities for those that can position for the change. Higher volumes could drive double digit top-line growth for inter-dealer broker (IDB) electronic business models. Global custodians stand to benefit from greater buy side demand for risk management and collateral transformation services. These areas drive much of our ~8% top-line growth forecast for the infrastructure space in 2010-2013, as core exchanges face ongoing structural headwinds.

Regulatory uncertainty remains the critical risk. The pace of implementation could cause some disruption to trading, and sharp hikes in capital requirements (as much as +$2 trillion, we estimate) could have the unintended consequence of reducing market liquidity.

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Part 2: Morgan Stanley’s Investment Thesis and Top Picks

Part 1: Overview and key themes

The crisis exposed severe weaknesses in the mechanisms by which risk is transferred in the financial markets. Since then policy makers, regulators and industry participants have worked to develop solutions, from more pre- and post-transaction transparency, to central clearing and greater use of electronic platforms for transaction execution.

This report investigates the imminent changes in market infrastructure and their expected impact on the landscape. We investigate how the economics of the industry are likely to evolve, and who the winners and losers are likely to be. In particular, we address the pending changes in the regulatory environment – the single most important factor shaping market infrastructure today and the main 'unknown' that will determine the end state of the industry. New regulation, as it stands, will benefit many infrastructure players, as transparency and risk management legislation shift revenues away from the dealer community and into the infrastructure space. But the effects are not universal; nor are players guaranteed to win in this new environment. Adaptation and evolution, though tough, will define the winners.

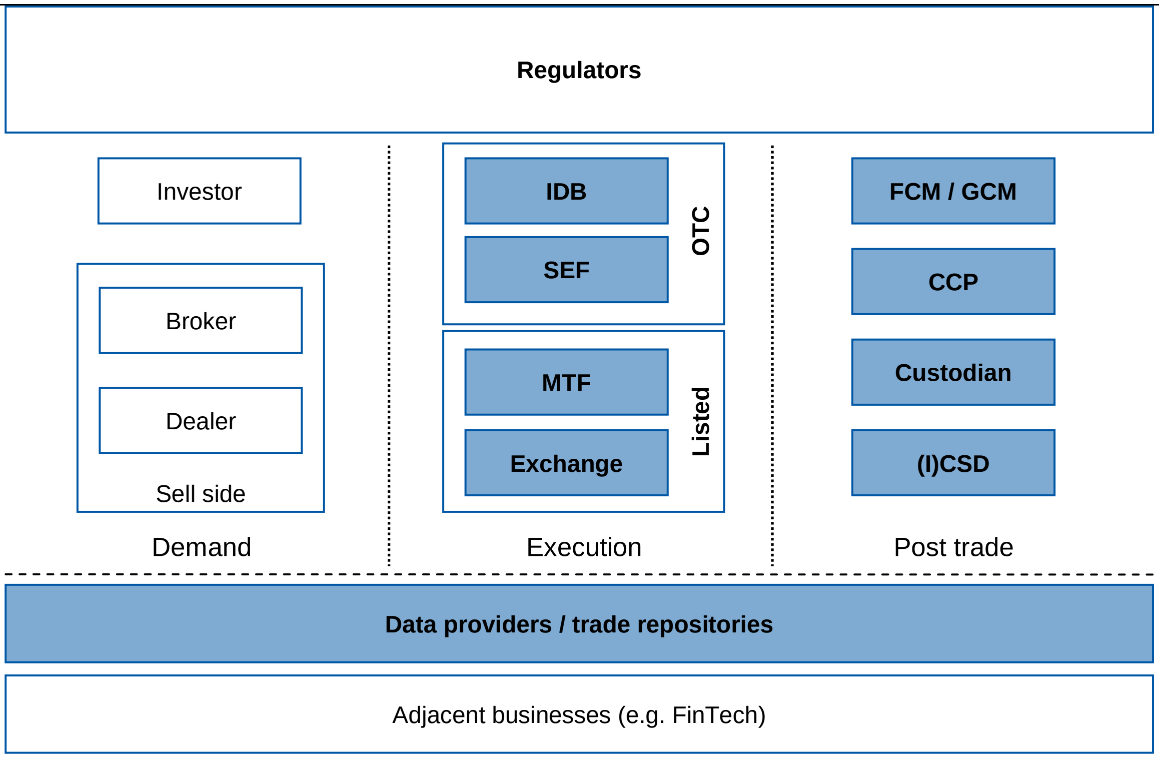
The landscape today

For the purpose of this report, we define market infrastructure as relating to all servicing layers along the trading value chain, including inter dealer brokers, exchanges, clearing houses, (I)CSDs, custodians and FCMs/GCMs (see Exhibit 1). Exchange-traded cash equities and fixed income, as well as exchange and OTC-traded derivatives, are at the core of the discussion.

Capital market infrastructure generated $70bn of revenues for participants in 2010, compared with $200bn in revenue earned by the broker-dealer community, as Exhibit 2 shows.

Exhibit 1

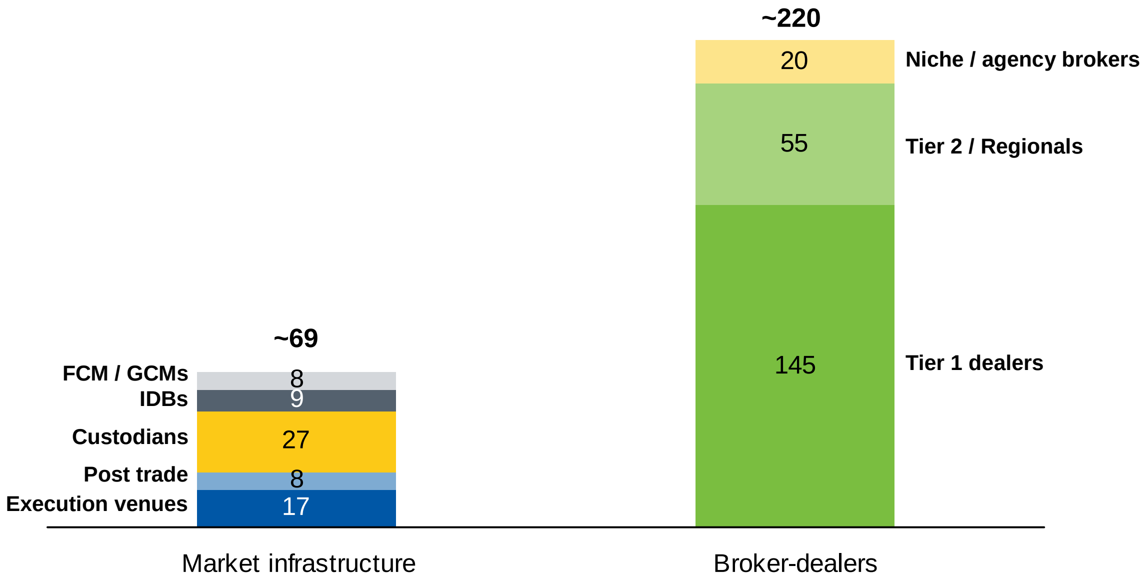
The market infrastructure space



Source: Oliver Wyman

Exhibit 2

Comparing market infrastructure and broker dealer revenues (2010, USD bn)



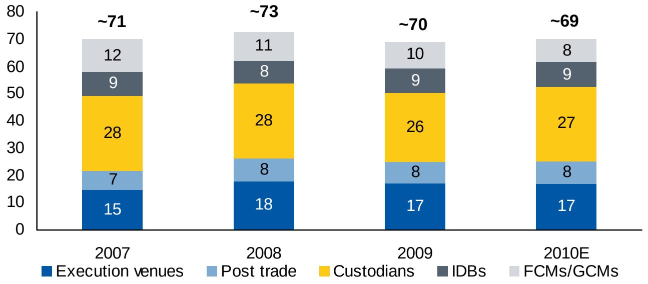
Source: Oliver Wyman

Although market infrastructure is subject to the same dependencies on client volumes, it has a dramatically different earnings profile to the broker-dealers. On the positive side, it has less risk exposure and greater operational gearing; on the negative side, less scope for growth and lower RoE..

Over the course of the crisis, total market revenues have remained largely flat (see Exhibit 3). Exchanges and FCMs/GCMs have been hit hardest in terms of profitability over the past two years, with a ~15% drop in revenues and creeping costs. The IDBs and custodians have had more moderate top-line pressure and have contained costs. We see these segments in a position of strength when volumes return and interest rates creep up. Post trade has been flat at the top line, though cost structures vary widely in the industry, and product expansion and/or verticalisation has been critical to remain relevant over the past two years.

Exhibit 3

Trends in market infrastructure revenues (USD bn)



Source: Oliver Wyman

Key themes

1. Consolidation of exchanges will continue as top line revenues are challenged, particulary in cash equities

- Cost synergies remain accretive to shareholders though there is scope for standalone cost management.
- Regional and asset class diversification will remain a driver of transactions and partnerships.
- A handful of global exchange groups will likely emerge as antitrust arguments have been muted since the early 2000s – though we expect continued opportunities for nimble platforms servicing niche clients.
- Policy makers and politicians will need to decide whether national interests require any local control and may demand some specific measures before agreeing on cross-border mergers.

2. Threats to incumbents are emerging as listed markets mature and margins erode, and OTC undergoes regulatory change

- In listed markets, traditional equities exchanges remain under pressure, as the rise of Multilateral Trading Facilities (MTFs) and High Frequency Traders (HFTs) has eroded margins and market share. European (I)CSDs revenue streams will come under severe pressure with the introduction of Target2Securities (T2S).
- In OTC, regulatory change will result in some margin erosion in both execution and clearing, due to greater transparency, more competition in clearing, and higher (potentially punitive) capital and collateral requirements for both the buy-side and sell-side.

3. But there are also new business opportunities, as regulators look to push more risk intermediation through market infrastructure, create greater transparency and market competition, and insert circuit breakers in the flows of capital in the industry

- Exchanges could launch distinct liquidity pools to safeguard equities trading volumes or increase their value chain coverage.
- (I)CSDs can expand banking services and collateral management offerings to offset revenues lost with the implementation of T2S.
- To the buy-side custodians can add new collateral management and transformation services aswell as allowing customders to leverage of their scale (eg middle office).
- Custodians can expand via value-added offerings, to hedge funds as well.
- Several new opportunities will arise in OTC markets as a result of new infrastructure required by regulatory changes in the US and Europe[1]. Swap Execution Facilities (SEFs) will electronify trading, and CCP volumes will rise, but the economics of these opportunities remains uncertain.
- A new breed of trade repositories will emerge, though we expect revenue opportunities to be limited.

4. Business model convergence and regulatory change are blurring the traditional distinctions between infrastructure players

- Boundaries are breaking down as a result of increased value chain coverage, particularly in the exchange space, as players look to defend their revenues.
- The lines between ATVs and exchanges may be blurred by the growth of HFTs and potential MTF consolidation.
- Overall infrastructure between listed and OTC markets are coming together, given both electronification of the OTC markets as well as the proposed regulatory reforms.
- Some medium-term convergence between OTC and exchange-traded derivatives is possible as short-dated OTC rates contracts converge with futures exchanges.
- However, given the different usage of derivatives contracts, we do not expect cannibalisation of volumes by either side. Rather, we believe it is a virtuous cycle that should increase overall volumes in both OTC and listed.

[1] Primarily: swap execution facilities / organised trading facilities, central counterparties and trade repositories

5. There is still some uncertainty on regulatory reform, and hence the overall economics and structure of the infrastructure space

- Once determined, the end-state of new infrastructure providers such as SEFs and trade repositories will have implications for incumbents hoping to defend or even strengthen their position in a post-reform world.
- The size of revenue pools will remain uncertain until reforms are implemented. In the central clearing of OTC contracts, for example, revenues will depend in large part on the eligibility and capability for clearing certain classes of trade, as well as CCP governance and access, i.e. their ability to charge and their participants' willingness to pay.
- Regardless, we expect revenues from the execution of OTC contracts to shift away from dealers towards the infrastructure layer, as new regulations add pricing transparency and force the standardisation of contracts/electronification of trading.
- Whether relating to the costs to incumbents of regulatory compliance or the cost and burden to the market of collateral requirements for centrally cleared derivatives, the costs of regulatory change are going to be high and will affect all market participants. It will be some time, however, before these are clear.

6. Infrastructure developments will have broader implications for the financial services industry as a whole. Market infrastructure is becoming a more prominent part of the capital markets, partly competing with banks, dealers and investors. In large part this shift is being driven by regulatory change

- Regulators are looking at the cash equities market as a benchmark for reforms in other segments, mainly the OTC derivatives market, though we expect they will recognise the need to retain some flexibility, given the dangers of a "one size fits all" approach.
- The main characteristics of the equities markets (transparency, open access, competition, fungibility, centralized clearing) are in strong contrast to today's opaque, concentrated, and mainly bilateral OTC markets.
- Regulators are pushing all markets towards convergence with the introduction of transparency of execution and open access to clearing.
- The result is a shift in control of flows in OTC from the dealers onto infrastructure platforms.

New regulation is still in the design stage

Both US and EU regulators have been active in reforming the financial markets following the crisis. The focus has been on OTC products, given concerns that the ~$435 tn swaps markets was lightly regulated and opaque (note the exhibit refers to 2009 notional outstanding of interest rate swaps, credit default swaps and equities swaps)

European regulators have also taken this opportunity to address some of the failings of MiFID on the listed markets. Exhibit 4 outlines the major legislation in progress that will affect market infrastructure.

Exhibit 4

Major US and EU regulations affecting market infrastructure

Area	US (Dodd Frank)	Europe (MiFID and EMIR)
Scope	▪ Dodd Frank covers all OTC derivatives – oversight split between CFTC, SEC, and Treasury	▪ All financial instruments, listed derivatives and cash equities ▪ Sub-regime for OTC derivatives
Execution	▪ Introduction of Swap Execution Facility (SEF) – electronic platform for OTC trading ▪ Mandated multi-dealer platform (RFQ or exchange) ▪ All clearable OTC contracts must be executed on a SEF	▪ Further scrutiny of MTF and SI platforms with increased oversight and thresholds for SIs for conversation to MTF ▪ Introduction of Organised trading Facility (OTF) – Regulated venue for derivatives trading ▪ OTFs trading products requiring clearing to be multilateral
OTC products on SEFs / OTFs	▪ All ‘products requiring CCP clearing and made ‘available for trading'’ ▪ Market to decide what products are placed onto SEF platform ▪ Any product made available on a SEF must be available on all other SEFs	▪ All sufficiently liquid and clearing eligible OTC derivatives ▪ ESMA to decide which product categories can be cleared and therefore traded on OTFs
Post trade reporting	▪ Real time trade confirmation ▪ 15 second lag for trade reporting ▪ 15 minute lag for “block trade” reporting conforming to the definition of a block trade	▪ Harmonisation of reporting requirements. Single reporting of trade data ▪ Block trading reporting regime – still undefined
Clearing	▪ All “standardised” derivative contracts must be cleared through a CCP ▪ All firms must have access to CCPs & clearing ▪ Exemption for “end users”	▪ ESMA to decide products requiring clearing ▪ Exemption non-financial counterparties below determined threshold

Source: Oliver Wyman

New regulations on both sides of the Atlantic have articulated two main principles:

- To provide regulators with comprehensive and timely market data on volumes, pricing and positions to improve monitoring of the financial system and reduce systemic risk.
- To promote greater liquidity and transparency, reduce transaction costs, and encourage broader participation through the public dissemination of trade data.

Regulators are actively working on regulatory convergence, though many proposals still differ in the details. We expect US and EU regulators to be broadly in line with each other following the full drafting process, though there is a risk that some key differences could create regulatory arbitrage and introduce, rather than reduce, systemic risk. Exhibit 5 outlines the key issues regulators are grappling with and where the common ground lies. A particular concern is where Asian regulators fall on many of these debates. Should Asian regulators take a more lenient stance than US and EU peers, trading activity could be pushed out to Hong Kong and Singapore.

Exhibit 5

Overview of US and EU regulatory themes

Key theme	US	EU	Common ground
Central clearing of “standardised” OTC derivatives	▪ All non-exempt “standardised” swaps will be required to be centrally cleared ▪ All swaps centrally cleared must be traded on an exchange or SEF ▪ End user clearing exemption – e.g. corporates ▪ Increased capital requirements for non CCP derivatives, with some exemptions	▪ Incentives will be used to encourage CCP clearing, likely through increased capital requirements on non-CCP cleared ▪ Possible exemptions for “non-financial counterparties”, with volumes below a certain threshold ▪ Less prescriptive than US regulators	▪ Move towards more CCP clearing ▪ Greater standardisation of derivatives products ▪ Also agree on strengthening bilateral clearing
Migration of standardised OTC derivatives onto exchanges / SEFs / OTFs	▪ Exchange / SEF (electronic platform) trading intended to increase transparency ▪ Will require that standardised OTC derivatives become exchange / SEF traded ▪ Market based approach to applicable products	▪ Derivative trading platforms to be codified as OTFs ▪ Regulated markets such as exchanges, MTFs to be defined stricter ▪ Extension of MIFID ▪ Prescriptive approach to applicable products / exemptions	▪ Standardised products should move to e-trading, ideally exchanges
Trade reporting of all non-CCP cleared OTC derivatives to trade repository	▪ All swaps will be recorded by a swap repository; data recorded will be available to regulators ▪ Daily settlement prices, volume, open interest	▪ Central collection of data on all OTC derivatives (CCP/non-CCP) in order to provide greater transparency on trade positions, prices, transaction volumes ▪ Post trade transparency to cover CDS, corporate bonds, ABS ▪ Swaps, options etc also subject to reporting requirements	▪ Greater transparency and reporting

Source: Oliver Wyman

The reforms in the pipeline are game changing for all market participants. Regulators – responding to the intensity of the crisis as well as the needs of market participants – have taken on ambitious timelines for drafting and implementing the reforms. US efforts are scheduled to be finished by the end of 2012. By July 2011, the CFTC has indicated that it will finalise the OTC legislation, with implementation to begin immediately. Europe looks to be about 6-12 months behind the US. While we believe these timelines are short, we do not see them being pushed into 2013, given the political momentum behind them.

We look at the new regulations and their potential impact throughout this report. The regulatory environment is the most important factor shaping market infrastructure today, and has introduced considerable uncertainty as to the industry’s end state. As it stands, regulation will benefit many infrastructure players as transparency and risk management legislation shifts revenues away from the dealer community and into the infrastructure space. The effects are not universal, however, nor are players guaranteed to win in this new environment. Adaptation and evolution will be difficult but necessary to win.

Consolidation of the exchange sector likely to continue

Since the end of 2009, the exchange space has seen a wave of renewed consolidation efforts, culminating most recently in large transatlantic tie-up announcements. We expect this trend to continue, in part because dislocation in the space has left opportunities for transactions at attractive multiples, but also due to increasing competition and margin erosion, specifically in cash equities – equity markets in many ways have become mature businesses with little scope to influence top line organically.

More broadly, the motivation for industry consolidation reflects a combination of three key factors:

- Global reach and regional diversification as a means to grow the revenue pot while reducing reliance on a single market / product set or regulatory regime
- Cost synergies as the "pipes" and platforms (both execution and post trade) are consolidated
- Scale to deter other suitors from making hostile bids

How valid are these drivers? These drivers are echoed implicitly or explicitly in every transaction; however, in many instances, we question their validity. We continue to believe there is an opportunity for cost synergies in cross-border transactions, given the relative independence of the trading platforms and the strong trend towards global distribution. Savings from (duplicative) investment in next generation trading and post trading platforms should also be substantial over time. However, implementation is non trivial, particularly to ensure that 1 plus 1 is greater than 2 or, for that matter, even 1.5. That said, we do not believe that the majority of exchanges are run as efficiently as possible, and so we think there is standalone scope for cost takeout in the model. To the extent that mergers can facilitate cost saving measures, we think there is scope to outperform initial cost synergy estimates. Revenue synergies, on the other hand, while in many ways compelling, have often proved elusive and will require focused customer-oriented strategies to realize.

What are the regulatory implications? Interestingly, compared to the speculation on similar planned or executed tie-ups 5-10 years ago, far less attention is being paid to anti-trust concerns, particularly with regards to derivatives. In large part this is because markets are more global and OTC and listed markets are ever more closely aligned. Similarly, the regulatory implications are probably less significant, as most markets today already allow for remote access, and therefore cross-border cooperation of regulatory bodies is a reality in most cases. However, as consolidation and mergers create ever bigger entities, regulators and policy makers will be inclined to view these new market infrastructure players as "systemically important". This could affect their approach towards such mergers and could lead to significant changes to today's regulatory framework.

Who will benefit from synergies? Recent announcements are to be structured as mergers rather than takeovers, and so we expect increasing focus on how to share the benefits between shareholders and users. This has been an issue in the past, where shareholders of at least one involved entity enjoyed a takeover premium, and we expect intensified debate between shareholders and users on the distribution of synergies.

Can consolidation spread to emerging markets? Whether this wave spreads further afield will be watched with great interest. While we see an argument for access to emerging regions, we see limited opportunity for US or European exchanges to purchase the most interesting assets in Emerging Asia or Latin America, given high valuations and potentially restrictive national agendas. But we expect consolidation to continue towards a small number of global exchange groups, raising interesting strategic questions for larger and smaller exchanges not yet directly involved. These include:

- Will the larger exchanges, through the wider network of issuers, investors and intermediaries be able to act as 'magnets' to smaller exchanges?
- To what extent will consolidation be 'virtual' as opposed to actual (i.e. JVs and partnerships)?
- How will the regulatory environment adapt to these new realities?
- Will Asian exchanges become involved, and if so, when?
- How actively will other stakeholders, most notably intermediaries, seek to shape this evolution as they have in other markets?

Will consolidation extend beyond the exchanges? We do not expect consolidation to be limited to the traditional exchange groups. For example, there is scope for traditional exchanges to acquire alternative trading venues and derivative platforms to expand product breadth (both listed derivatives as well as OTC) and platform depth. In addition, such consolidation could fuel rapid growth and the emergence of hitherto niche platforms aimed at specific subsets of the market (execution, data, or processing solutions for distinct customer groups).

Consolidation leaves some key strategic questions unanswered. The current wave of mergers appear accretive to shareholders based on targeted cost synergies; but do not, in our view, address the more fundamental questions facing the exchange industry. We still see an opportunity to grow revenues organically and capture volume share through better customer interfaces and product creation. The race to the bottom on cost is not a sustainable strategy, in our mind. While better cost management and realised synergies should help the exchange segment to trade at higher multiples, incumbents still face a hard road versus the more nimble electronic platforms. In fact, the recent news of consolidation of these platforms could form the basis of the toughest competition in the sector to date. We address the key challenges facing incumbents in the following section.

Incumbent (cash) equities exchanges are losing control over price discovery

Incumbent cash equity exchange business models remain under pressure worldwide. Maturing markets have compressed pricing margins and global volume growth has not offset lost revenues. Although the problem is broadly the same everywhere, there are regional differences. The US exchanges have generated enough volume growth to paper over some of the structural challenges (in 2006-09 volume CAGR was 11% by value of shares traded, and ~5% by number of shares traded). The relative maturity of the US market also means recent pressure is less acute, with the traditional exchanges, NASDAQ and NYSE, accounting for only ~50% of total share volume.

Asia's market structure has allowed the regional and local exchanges to prosper through the crisis. Growing domestic investor interest in local currency shares, coupled with relatively closed trading participation, has shielded the region's incumbent exchanges from the margin and competitive pressures facing US and European exchanges. In addition, in Asia much of the value remains in the lucrative and fast growing share listing business rather than in traded volume growth.

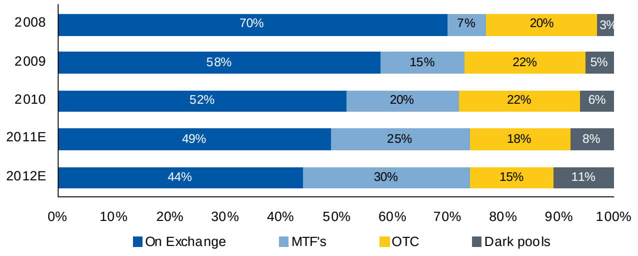
European incumbents have felt the most pain. The introduction of MiFID in 2007 and the increase in HFT (high frequency trading) led to the rise of electronified alternative trading venues (ATVs), namely MTFs (multi-lateral trading facilities) and dark pools (see Exhibit 6). Europe is some three years behind the US in this development cycle, as evidenced in pricing differences in Europe and the US: European MTFs currently have a revenue to volume ratio of ~0.10 bps compared to the US exchanges at ~0.12 bps and European exchanges >0.7. We believe European exchange and MTF pricing will converge, with revenue to volume ratios falling closer to those of the US exchanges.

MTFs have benefited from the growth in high frequency trading (HFT), following the introduction of cross market clearing in Europe. MTFs have relied on HFT to gain critical mass and take volume share from the exchanges. Lower execution pricing from MTFs has polarised trade types Large deals (>€5,000) accounted for just 13% of total volumes on European ATVs in 2009, up 6 percentage points on 2008. However, HFT volumes have also risen on MTFs, as indicated by the high proportion of shares traded on MTFs with average deal sizes below €5,000 (87% in 2009).

We believe connectivity of the tier 2 brokers to MTFs remains the catalyst for the exchanges' volume share to slip below ~45%. While connectivity costs remain high and so activity between exchanges and MTF are still siloed by user type, the increasing propensity for tier 2 banks to connect through the global IBs in a wholesale model could be the tipping point for the exchanges' market share to decline rapidly.

Exhibit 6

European cash equities traded volume by execution venue (2008-2012E)

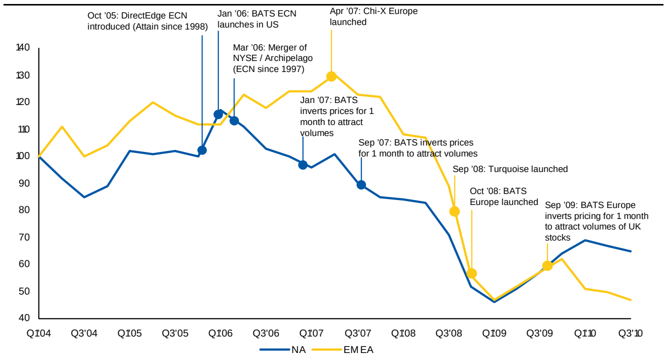


Source: Oliver Wyman

As the US experienced in early 2000s, the introduction of ATVs lowered trading costs, providing incentives to users to shred trades and creating a new industry of small trading-size prop traders. These traders provided large volumes, but dramatically reduced overall average trade size. In Europe, with the introduction of MTF price competition in recent years (see Exhibit 8) there has been a similar reduction in average trade sizes. This effect has been more prominent for on-exchange execution, with a drop of ~22% CAGR since 2007, compared to a drop of 7% CAGR on MTF venues. Smaller and smaller trade sizes made it increasingly difficult for asset managers and other institutional investors to efficiently execute larger order sizes, as explicit costs (i.e. exchange and clearing fees, taxes) only account for 5-15% of overall transaction costs, the majority driven by market impact and opportunity costs. In short: as trade size has come down, the cost of transacting in size has risen. As a result, real money managers have experienced cost increases of 40-50% due to an increase in market impact and slippage, which ultimately helped push volume onto dark venues to lower transaction costs. Partly due to this, the US has experienced a rebound of ~14% growth in trade size as the traditional investor base has matured and become more sophisticated around order routing. As the European market matures we expect market structure increasingly converges with US markets. .

Exhibit 7

Evolution of exchange average trade sizes – Europe is following the US trend 2004-YTD 2010 (indexed to 2004)



Source: Oliver Wyman

Ultimately, the destabilisation of the incumbent exchanges has led to a loss of control over price discovery. Five years ago share prices on the incumbent exchanges were the only reference source of tradable pricing for the ATVs; today, these new entrants have gained a measure of control over price discovery.

Analysis of LSE outages since 2008 (Exhibit 8) maps the erosion of its dominance in price discovery, as MTFs have become more established.

Exhibit 8

LSE outages since 2008 show its waning control over price discovery

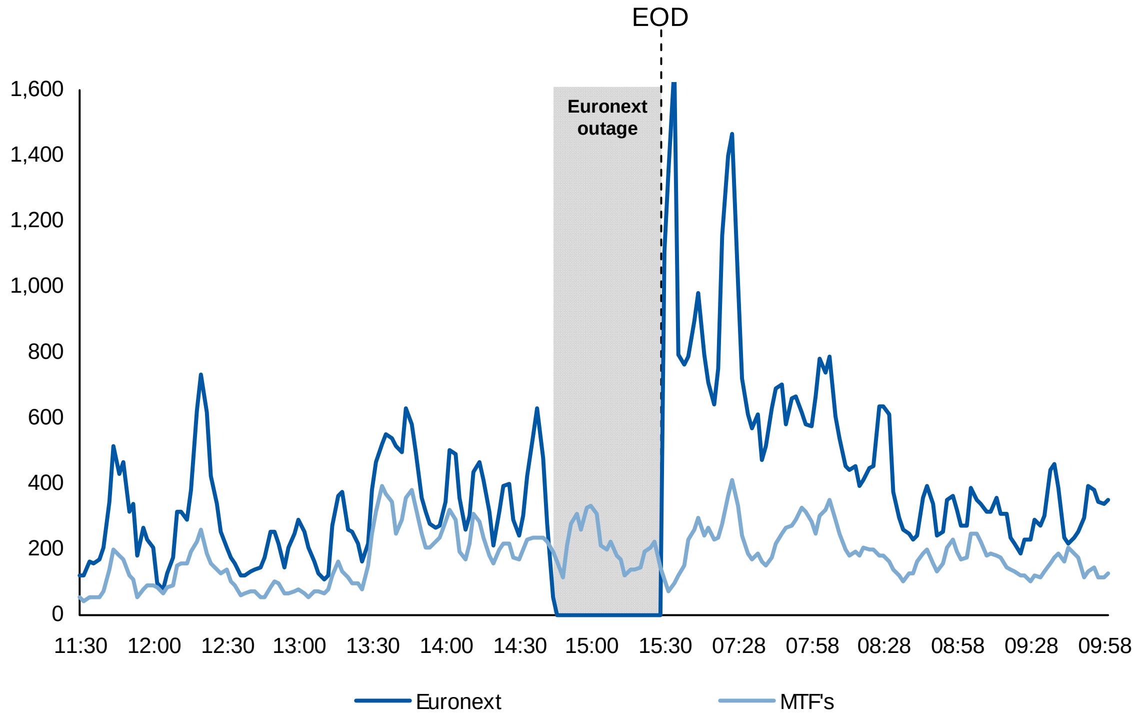
		Impact		
Date	**Details**	**Summary**	**MTF volumes[1]**	**Implications**
8 Sep 2008	▪ Connectivity problems leave some brokers unable to trade ▪ LSE forced to suspend trading shortly after opening to ensure no disadvantage to affected parties ▪ Trading finally resumes at 1500GMT, 30 minutes prior to scheduled close	▪ Trading largely ceases on newcomer Turquoise ▪ Impact was high given the expect surge in trading after the US bail out of Fannie Mae and Freddie Mac	▪ ~90% reduction on both Chi-X and Turquoise	▪ Early days of MTF trading sees price discovery remain with the primary exchanges – Trading is not held up on MTFs without reference pricing
9 Nov 2009	▪ Computer glitch halts trading in 300 stocks from 1504GMT to close of trading ▪ One twelfth of all equities were affected, including 8 FTSE 100 members ▪ Closing auction for affected stocks was suspended	▪ Preliminary data suggests an increase in volume on both Chi-X and BATS, while Turquoise sees a small reduction in volumes	▪ Chi-X and BATS volumes drop to 50% of expected levels during the outage ▪ Volumes on Turquoise are down to a third of expected levels	▪ Price discovery now occurring on multiple venues – MTFs are able to continue trading without reference pricing from primary exchange – Some evidence of volume migration
26 Nov 2009	▪ LSE identifies connectivity problems at 0930GMT ▪ LSE places all order books into auction mode at 1033GMT as a defensive measure ▪ Announcement at 1325GMT that trading will resume at 1400GMT, which it does	▪ LSE continued to generate quotes throughout the outage indicating false liquidity ▪ Apparent liquidity and a 'false' LSE auction was attributed for the drop in volumes on MTFs ▪ FSA suggests MTF-run dark pools suspend trading during a 'primary' exchange outage	▪ All MTF's see volumes drop by ~85%	▪ Defensive move by exchange freezes out MTFs, who are unable to maintain volumes – After previous outage LSE was quick to adopt a defensive position and declare auction mode – Trader systems did not reroute orders

Source: Oliver Wyman

A review of the Euronext exchange outage on the 13 October 2010 (Exhibit 9) shows that MTFs are today capable of maintaining volumes during a primary exchange outage, suggesting that they offer reliable price discovery even when reference markets are down and have attracted a group of distinct users. Although some users are unwilling to shift (as shown by the fact that MTFs do not necessarily pick up the volume levels equivalent to those traded on the primary exchange prior to an outage), this nevertheless highlights the greater confidence in MTFs as venues for price discovery.

Exhibit 9

The Euronext outage in October 2010 suggests MTFs can offer reliable price discovery
Equity trade volumes by venue, Number of trades (K)



Source: Oliver Wyman

In Europe, we see a material threat to the exchanges if this trend accelerates. Today the exchanges retain a distinct user group in the tier 2 and 3 brokers, but this is rapidly changing as these firms upgrade their connectivity, either through technology upgrades or more likely linking directly to a tier 1 dealer in a wholesale relationship. As this trend plays out, the distinction between primary exchanges and MTFs will be broken, creating a level playing field. This will ultimately force a race to the bottom in execution pricing. Europe will need to break down the barriers to trading rather than defend them to foster the volume growth needed to replace revenues lost to pricing compression. The idea that a single type of execution venue will work for all players no longer holds, and the unique requirements of certain types of trades are beginning to drive a divergence in the types of execution venues we see.

In the case of the US, embracing these changes has led to increased volumes covering the margin compression, and the US markets have reached a degree of stabilisation. US equity volumes were roughly 4 times those of the EU exchanges last year, up from just 1.5-2 times in the early 2000s. The US markets show that loss of price discovery need not be the death knell for incumbent exchanges.

For the European incumbents to survive without a structural reduction in their revenue base, they must break down barriers to trading and foster volume growth. This will be particularly important if MTFs continue to pursue market share, whether through price inversion or consolidation.

We think the exchanges will face some tough decisions to defend and grow top line revenues. Some key areas for consideration are:

- Single liquidity pool vs. distinct liquidity pools for order types – low latency vs. depth vs. dark pools
- MTF and OTF strategy – building an electronic order book outside the MiFID definition of a “Regulated Market”
- Commitment of IT spend for latency reduction
- Horizontal vs. vertical integration of clearing models
- Pricing models by order flow type, segmented pricing structures, etc.

- Expansion strategy into adjacent, non-trading services – e.g. data

In Asia, the incumbent exchanges have yet to feel this pressure. This remains a market driven by issuance. The lack of serious electronic platforms will likely support execution pricing margins in the near term. This, coupled with growing onshore investor demand and national protectionist measures, should give incumbents the comfort their European and American peers are lacking today.

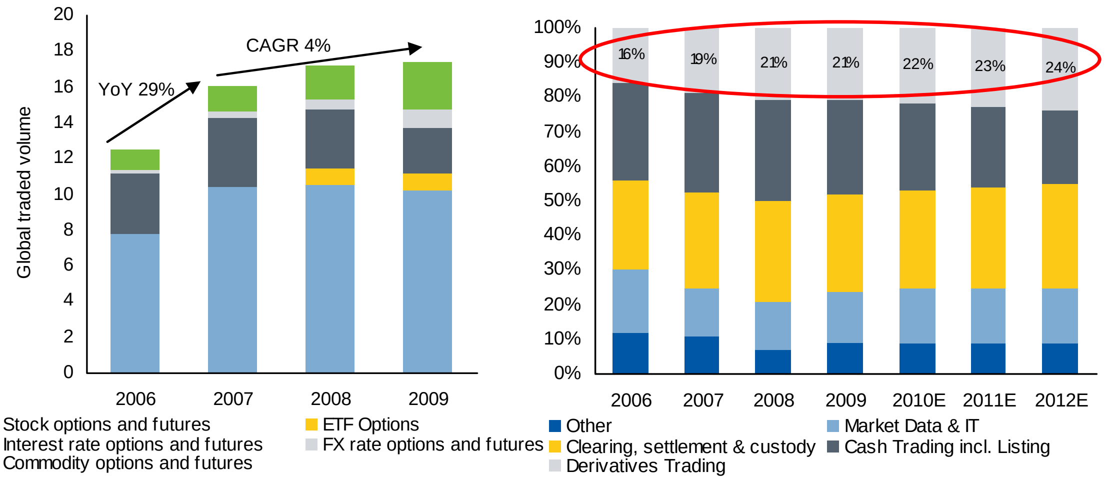
In summary, since 2007, as a result of market share erosion and pricing pressures, cash execution as a percentage of revenue for the incumbent exchanges has fallen 3-4% globally. We expect an additional loss of 3-4% over the next two years, largely driven by the European exchanges. Although listing fee, market data and IT revenues should remain relatively stable, it is unlikely that these revenue streams can fully offset the erosion in execution revenues.

Listed derivatives exchange model still defensible?

The success of exchange-traded derivatives for the main exchanges typically centred on first mover advantage in new products, a powerful member base, product engine and technology enhancements, and attractive fee schedule.

Exhibit 10

Evolution of global volumes (2005-2009) and revenue share exchange-traded derivatives (2007-2010E)



Source: Oliver Wyman

Derivatives exchanges have weathered the crisis comparably well, generating a 3-5% CAGR by number of traded contracts, and traded volume in selected contracts has grown at a >10% CAGR over the past five years. Although some minor changes in revenue bases were observed across leading global derivatives exchanges, the total share of revenues generated from exchange-traded derivatives has been largely stable over the past couple of years (see Exhibit 10). Competition in the space has been limited by the lack of fungibility of contracts, control of open interest through limiting CCP access to exchange traded only contracts, limited collateral netting opportunities in new products and by intellectual property rights protecting certain contract types (with isolated exceptions such as US options).

The recent rulings in the US around the fungibility of contracts have opened a new threat for the incumbent derivative exchanges. If a scenario as envisioned by the US regulator materialises, the exchange-traded derivatives model could be contested, both through break-up of existing liquidity pools and launch of new venues using comparable, replicated structures. But we see this as a medium-term risk, as the frictional costs of transferring open interest to less liquid venues is too high for users to justify in the near term.

Exhibit 11

Summary of recent US regulatory debate

Cornerstones of regulatory debate on fungibility

- In January 2008, US Department of Justice called for a review of futures clearing and alternatives
  - Incl. overhaul of vertical clearing/shift to horizontal utility model as used for equities and options
- Main rationale was to foster competition in execution services
  - Currently impeded through control over open interest and clearing by incumbent exchanges
- Campaign for fungibility gathered support of senior SEC, FIA and CFTC executives
- Still, SEC and CFTC recognised in October 2009 that fungibility would enable "free riding" and that futures exchanges should be able to recoup their investments

ELX response to fungibility discussion

- Introduction of a new rule by ELX, enabling market participants to privately negotiate two discrete but integrally related transactions
  - Establishment of a futures position on ELX
  - Concurrently liquidation of a position on another exchange listing identical contracts (or vice versa)
- Thereby migration of positions between respective exchanges' clearinghouses, allowing investors to switch between markets
  - Exchange of futures for futures (EFF) as a tool for easy use of new market
- Approval by CFTC in Sept 2009
  - However, CME insisting EFF trades contravened own rules

Recent developments and outlook

- After more than 9 months of debate with the regulator, CFTC backing ELX in August 2010
  - EFF trades declared as not being illegal
- No reaction by CME, followed by CFTC antitrust inquiry in relation to the Commodity Exchange Act
- Ongoing information discussions between CFTC and Department of Justice
  - At the same time, CME declaring EFF rule as anti-competitive
- Currently no sign of regulator forcing CME to support EFF trades going forward
- Even if fungibility obtained regula-tory approval in US, acceptance in other markets is still questionable

Source: Oliver Wyman

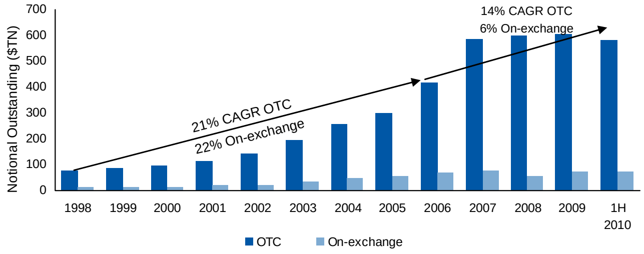
The interplay between the OTC and listed markets will be a key driver of change over the coming years. Growth in OTC derivatives is still outpacing exchange-traded derivatives, with notional outstanding growing at a >20% CAGR over the past 10 years (see Exhibit 12). This is broadly due to customer preference for bespoke products for hedging. Despite the recent debate with respect to the risks inherent in OTC derivatives transactions and emerging regulatory reform, we expect above-average growth rates to persist in the medium term, driven by increasing standardisation/electronification and sophistication of end-users in OTC.

At the same time, reforms to the OTC market are likely to increase liquidity and pre-trade price transparency. This, coupled with the similarity in short-dated swaps and futures contracts, will offer an opportunity for exchanges to capture volume with trading around pricing arbitrage. This should allow a more efficient end-user execution pricing environment, and would represent a wholly new type of trade flow and revenue stream in the listed markets. However, we expect this to be a mid term (three year) development, with institutional support from the trading centric investment banks as they develop new trading algorithms to facilitate market growth.

There is also a downside scenario for the listed derivative markets in the evolution of the OTC markets. If the regulators do indeed push hard for contract fungibility, the strongest competition could actually emerge from the OTC markets, especially as product standardisation progresses and eligibility for clearing dilutes boundaries between the OTC and the on-exchange layer. The exchanges have been at the forefront of this debate, and a positive outcome for them could further concentrate open interest in flagship listed and OTC contracts in the space. This is a specifically US issue, however – in Europe, fungibility lags behind development of the US market, and has not formed a core part of the debate.

Exhibit 12

Development of global on-exchange vs. OTC derivatives (1998-2010)



Source: Oliver Wyman

In short, we expect the existing derivatives model to remain defensible in the medium term, assuming exchanges' ability to clear at the main liquidity point remains closed to new entrants. While there are downside outcomes, we see greater likelihood of upside from the OTC developments. These benefits are likely to be longer term and based on increasing liquidity at the short end rather than large-scale transfer of liquidity from the OTC into the listed markets.

Two-tiered execution model emerging in OTC

The $435 trillion OTC swaps market has been pushed to the top of regulators' agendas in 2010. Given the political winds in the US and Europe, we expect regulators to put through many of the proposed reforms around electronic trading, central clearing & risk management, price transparency, and post trade data capture by 2012/2013 depending on the speed of regulatory implimentation. Although the legislation has not been finalised and the detailed end state remains unclear, we see three scenarios for the development of the OTC market infrastructure in the near term (see Exhibit 13).

Exhibit 13

OTC Models – Potential Outcomes

	Two-tiered model	Open access	Bifurcation
Regulatory action	▪ Asset specific approach to appropriate pricing model (RFQ vs. EOB) ▪ Stringent requirements for product / client type exemptions ▪ Ownership of SEFs & CCPs limited for dealers ▪ Demanding post trade reporting times for normal trading ▪ Lower thresholds from block trading	▪ EOB structure forced into most liquid markets (e.g. FX, some rates) ▪ Dealers ownership of SEFs or DCOs limited / eliminated ▪ Mandatory open access to SEF platforms ▪ Demanding post trade reporting times for normal trading ▪ High thresholds for block trade reporting – time, size, etc. ▪ Mandated FCM / GCM clearing access	▪ Softer stance on "standardisation" definition – wider interpretation of end user exemptions ▪ Mandatory open access to SEF platforms ▪ Demanding post trade reporting for non-block trades ▪ Softer reporting requirements & higher thresholds for block trades
Resulting market structure	▪ Inter-dealer market intact / separate from dealer to dealer market – two tiered pricing structure ▪ Single dealer platforms limited due to ownership requirements – some product exemptions (e.g. exempt FX) ▪ Prime brokerage increasingly important – collateral services, etc.	▪ Rise of vertically integrated OTC "exchanges" ▪ Dis-intermediation of dealer community – fall of trade size, rise of HFT ▪ Aggressive standardisation of OTC contracts	▪ Migration of short dated contracts to EOB ▪ Single dealer platforms in place for exempted asset classes / block trading ▪ Bespoke structures widely used for hedging ▪ CCP access by venue – agency for end users / FCMs for investors
Winners	▪ Primary dealers ▪ End users ▪ IDBs ▪ Custodians	▪ Exchanges ▪ Hedge funds / HFTs ▪ Second tier sell side	▪ Corporates ▪ Asset managers / real money ▪ IDBs
	Base case scenario		

Source: Oliver Wyman

The most important change the new regulations will bring about is greater pricing transparency in the execution layer of OTC markets. Regulators have already indicated that they will introduce swap execution facilities (SEFs) and electronify the trading of OTC derivatives. We expect these platforms to be at least mandatory multilateral RFQ platforms given current average trade size and daily turnover (see Exhibit 14). For CDS indices, a central limit order book has been put in place, though this is less feasible for single name products.

Exhibit 14

OTC swaps daily trading characteristics by asset class

	Avg. daily turnover		
Swap type	**By value**	**By # of contracts**	**Implied avg. trade size**
FX swaps	~$1.7 Tr	>2MM	<$1MM
Equity swaps	~$25-30 Bn	>10 MM	<$0.01 MM
Rates swaps	~$1.3 Tr	3000-3500	~$400 MM
CDS	~$400-500 Bn	40,000-50,000	~$10 MM

Source: Oliver Wyman

Despite past failures, in the medium term we believe a central limit order book could emerge in short-dated rates contracts converging with the on-exchange futures contracts. However, given the current state of order types and the structure of the OTC markets, particularly rates, towards end user hedging, the convergence to an exchange-like structure for rates swaps is some way off (see Exhibit 15). This would be a totally new type of volume flow, driven by the directional and arbitrage strategies of hedge funds and HFTs that favour the more nimble trading based investment banks and dealer-friendly exchanges.

In the near term, the large balance sheet dealers and incumbent trading platforms, such as Tradeweb and iSwap, will be the beneficiaries of the SEF market structure.

Exhibit 15

Order type by contract type/user category

	Cash equities	**Listed futures**	**OTC rates**
All investors	75-80%	60-65%	15-25%
Of which is traditional	*30-35%*	*10-20%*	*15-20%*
Of with is HFT	*40-50%*	*45-55%*	*0%*
End user hedging	N/A	30-35%	75-85%
Block	20-25%	<5%	N/A[1]

Investor driven → **Hedging driven**

[1] Block defined as pre-arranged OTC trades

Source: Oliver Wyman

While the end state structure of these trading platforms has not been fully detailed, the marketplace has accepted the inevitability of SEF structures in the execution layer. Several players in the market have already expressed an intention to become SEFs (see Exhibit 16).

Exhibit 16

Electronic trading in OTC derivatives – emerging players

Platform	Example players	Products	Description	Market dynamics and outlook
Inter-dealer	iSwap	Rates	▪ Inter-dealer electronic platform operating since 2001, but re-launched with dealer backing in September 2010 ▪ Automated matching using centralised credit limits ▪ Full order book functionality	▪ Will largely survive in existing form as separate inter-dealer market remains ▪ Some, limited adaptations will be required to comply with SEF requirements e.g.: – Implementing RFQ or CLOB trading systems – Changing access requirements e.g. volume restrictions to expand access to broader range of dealers, including smaller ones – Upgrade reporting capabilities
	BGC	TBD	▪ BGC Trader is a multi-asset, integrated voice and electronic price execution platform ▪ 'Volume Match' anonymous auction-style trading system for credit and FX	
	eDeriv	Equities	▪ Inter-dealer electronic platform ▪ Dealer electronic quoting and RFQ, platform includes post-trade processing	
	GFI Group	TBD	▪ Currently has hybrid voice / electronic trading platforms for Fixed Income, FX, Rates and Commodities	
	Tullet Prebon / Millennium IT	TBD	▪ Partnership announced in 2010 to develop electronic trading across a variety of asset classes	
	Tradeweb (Dealerweb)	US Gov't bonds, MBS	▪ Bank / dealer-owned, multi-dealer electronic trading platform ▪ RFQ model	
	Tradition	TBD	▪ Planning to offer electronic trading in rates	
Dealer-to-customer (multi-dealer)	Javelin	Rates, CDS	▪ Dealer-backed SEF under development, using a combination of electronic and hybrid electronic technology ▪ Will utilise Central Limit Order Book (CLOB) pricing rather than RFQ model ▪ Will also offer real-time STP	▪ Multi dealer-to-customer platforms are well placed to gain market share, particularly those that already utilise an RFQ pricing model ▪ Scope of players still reliant on hybrid or voice execution will become limited, requiring technological / operational improvements to become SEFs
	MarketAxess	Credit	▪ Dealer-owned, multi-dealer electronic trading platform operating since 2001 ▪ Currently has 70+ participating dealers globally ▪ RFQ model	
	Tradeweb	Rates, Credit, Equities (European equity options)	▪ Bank / dealer-owned, multi-dealer electronic trading platform ▪ Global platform (intsitiuional clients only, they have a separate retail platform – Tradeweb Retail) ▪ RFQ model	
Dealer-to-customer (single-dealer)	DB AutoBahn, GS RediPLUS	Multi-asset	▪ Multi-asset, proprietary execution platforms ▪ Institutional only (e.g. DB has separate retail FX platform)	▪ SEFs must be multi-dealer platforms, therefore cannot survive in current form – can either expand to multi-dealer offering or compensate via participation in another SEF e.g. Barcap, Citi, CS, DB, MS consortium ▪ Significant adaptation required

Source: Oliver Wyman

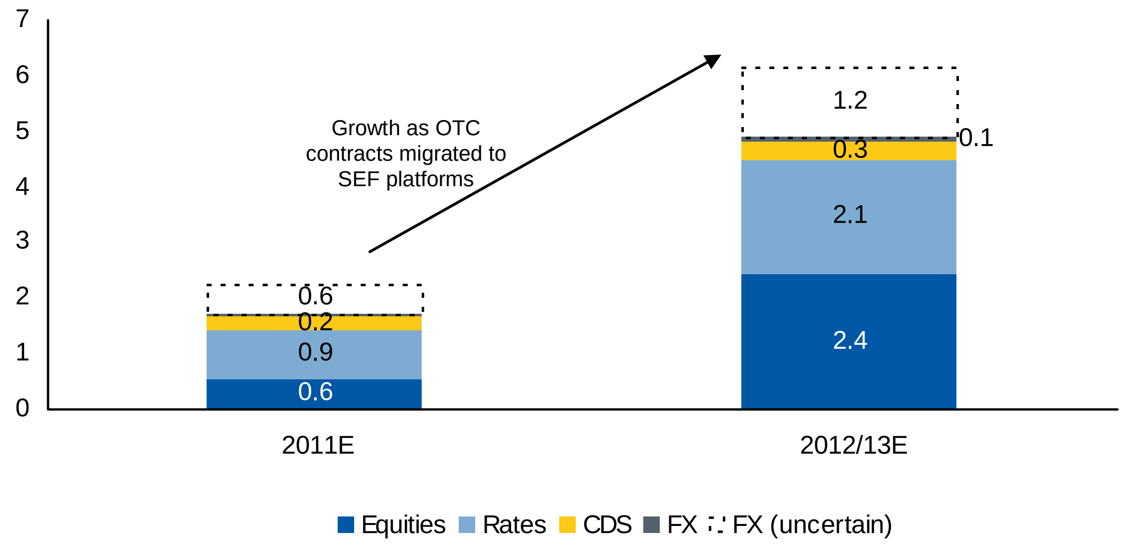
Even with improved transparency in the execution of OTC swaps, we expect a two-tiered pricing model with a separate inter-dealer market to remain intact. This has important implications for the platforms in OTC trading:

- **In the dealer market, the IDBs will fulfil regulatory requirements to become SEFs** and provide their current platforms across a widened set of dealers, though the buy-side will remain excluded. We anticipate little change in the functioning of this marketplace except around increased statutory reporting requirements and the extension of the dealer community through the mandatory extension of CCP membership as volume and capital restrictions are relaxed.
- **Dealer-owned dealer-to-customer platforms will be affected as regulators** push for pre-trade pricing transparency and restrictions on dealer ownership of SEFs. This is likely to be in the form of mandated multi-dealer SEF structures with RFQ pricing versus the single dealer platforms that exist today. The current SEF definition specifically prohibits one-to-one voice and single dealer platforms, making these systems defunct in the future.

- **Current multi-dealer-to-customer and customer-to-customer trading platforms are well placed to gain market** share from the dealers. Though liquidity remains an issue, as in the past maintaining two-way pricing without dealer support has broadly failed in OTC.
- **We do not see significant execution price compression in this model, as we expect the two-tiered pricing structure to remain in place.** Rather we expect moderate price erosion of 5-10% annually, as post trade pricing transparency squeezes margins.
- **While we expect moderate dealer pricing compression, some execution revenues will shift to the new SEF platforms.** We estimate SEF platforms will capture 10-15% of the execution revenue pool or $5-6 bn in revenues by 2013 (see Exhibit 17).

Exhibit 17

OTC SEF revenue pools (2011E – 2013E, USD bn)



Source: Oliver Wyman estimates

The emerging execution model also has implications in the clearing layer:

- **We believe that clearing house participation will be limited** by the emergence of the default fund model with minimum capital requirements for membership. Buy-side clients will connect through an FCM/GCM.
- **Custodians and prime brokers will benefit from this disintermediation of the buy side.** Given a projected $2.0-2.5 tn of additional capital needed to collateralise current standardised OTC trading today (not accounting for multilateral netting), buy-side participants will be obliged to either borrow collateral from the dealers or transform collateral into cash and securities accepted for collateralisation of clearing. Margin for clearing long dated contracts could make trading too costly for non-exempt counterparties.

We expect European and US regulators to work to converge OTC trading rules. However differences in contract standardisation and fungibility could create distinct market structures in execution and clearing. The greater fungibility of volumes in the US allows for execution and clearing layers to be separated and opens the market to new players. In contrast, the stickier volumes in European markets could lead to pricing of execution and clearing of OTC contracts to be bundled.

Ultimately, the flux in the model has a dramatic effect on all market participants. While we do not expect a major drop in revenue pools, the dislocation in the marketplace will shift a share of those pools to new participants. As in any market dislocation, there will be winners and losers.

- **IDBs will be the winners of regulatory changes.** Their incumbent position in the inter-dealer market is highly defensible, with pricing power in ancillary services. We expect additional post trade services to further diversify income. Furthermore, IDBs will gain better control over pricing power of the electronic trading venues, though we believe they will remain blocked by the dealers from opening their platforms to the buy-side.

- **Exchanges will have mixed results.** Those that embrace the dealers and create execution and clearing facilities with a level of dealer governance will likely win volume quickly, though revenue uplifts may vary markedly. Those that try to disintermediate dealers may have some early success, but we do not see this business as sustainable, given the lack of long dated exchange contract liquidity and underlying end user demand for hedging products.
- **The buy-side is likely to see very little change in overall economics.** However, it will run more operational risk around margining of CCPs and collateral management, where custodians and CSDs have an opportunity to step in and capture some revenue share from the dealers.
- **Primary dealers are under some margin pressure and significant capital pressure.** However, we would expect a portion of lost financing revenues to be captured through collateral management and transformation services. Smaller banks may face some challenges, i.e. exclusion from CCP structure prevents them from being price makers in derivative execution.
- **CCPs will be structurally changed by the new regulations.** Their role will evolve from member risk mitigation to systemic risk management. Furthermore, we expect additional revenue opportunities of ~$1 bn by 2012 in clearing OTC trades (across all asset classes, of which ~$400 m relates to contracts executed via SEFs), as cleared volumes increase and pricing margins stabilise.

Although provisional regulations have now been published in the US and regulators have entered into the comment phase with the industry, there remain several important unknown elements to both US and European regulations.

1. **The products covered by US and EU regulations are still uncertain.** IR swaps & options and credit derivatives appear to be driving the OTC reform, while FX, equity swaps and commodity based derivatives are likely to be included as well. The picture for FX products is unclear: FX spot trades are almost certain to be exempt and perhaps FX swaps, given the low counterparty risk and high market transparency already in place. We expect currency swaps to be treated in the same manner as IR swaps.
2. **The extent of final regulations and possible implementation dates are still unclear.** The US Dodd-Frank act was expected to come into effect in July 2011; however this may not be the case for all parts of the bill, with indications from the CFTC that SEF legislation may need more time. EU legislation is likely to lag behind the US, although the rules may well be similar.
3. **Trade reporting requirements are clear, but it is still unknown whether the regulators have the capability to use this data effectively.** The time it would take to calculate the positions of financial entities from trade repository data could be huge unless regulators set up sophisticated data management systems in tandem with the trade repositories themselves.
4. **The threshold for block trade sizes is still unknown and hotly debated,** given the exemption from SEF execution of block trades. Methods suggested for calculating the minimum trade amount to constitute a block trade range from fixed values to rolling average trade values or some combination of these based on asset class characteristics.

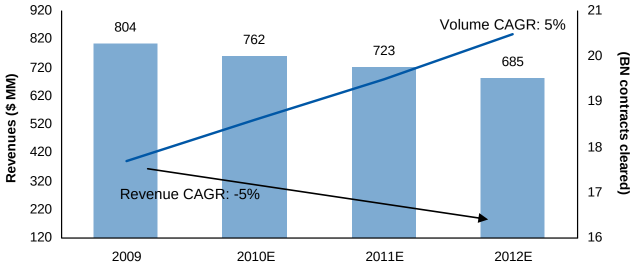
Reshaping the CCP landscape

We expect emerging regulatory reform in the US and Europe to have a significant impact on the clearing landscape in the OTC derivatives market where central clearing is being introduced. This will create new revenue pools in the OTC market in the face of declining or flat economics in on-exchange derivatives clearing.

Clearing of listed derivatives tends to be vertically integrated within exchange business models, resulting in bundled price offerings, and we do not expect migration of open interest to ATVs immediately. Rather we see a moderate decline in revenues from clearing of listed derivatives at around a -5% CAGR over the next two to three years due to margin compression (Exhibit 18) as exchanges are forced to add pricing transparency between execution and clearing fees (particularly in the US).

Exhibit 18

Exchange traded derivatives cleared volumes and revenues



Source: Oliver Wyman

The introduction of OTC derivatives into CCP infrastructure creates a new revenue pool, but the economics of the opportunity is still far from clear. Furthermore, refocusing regulation towards systemic risk mitigation will entail material changes to the operating models of existing CCPs.

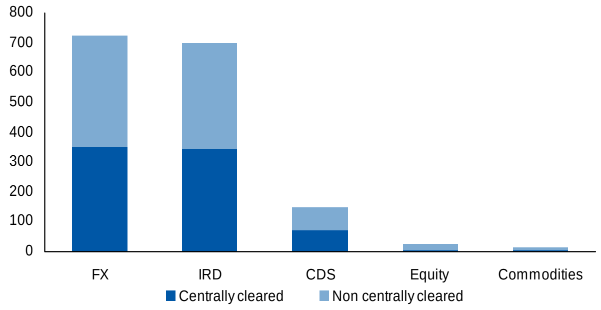
Globally, regulators have agreed that “standardised” OTC derivatives contracts will need to be cleared centrally, but the ultimate definition of a “standardised contract” remains open:

- Emerging views suggest that products eligible for central clearing will probably be determined by criteria such as underlying liquidity, level of process automation/electronification and duration to maturity.
- Credit derivatives and interest rate contracts will probably be most eligible for central clearing due to the degree of standardisation (and indeed they are today).
- Equities and commodities options are expected to among the least standardised/eligible asset classes.
- FX swaps and forwards are not currently excluded from clearing regulations, but we feel this is likely to change due to industry pressure based on their low counterparty risk and use as a hedging device. We have included FX swaps and forwards only speculatively in our future calculations for clearing and SEFs.
- Currency swaps are likely to be treated in the same manner as interest rates contracts.

In the long term, we believe that up to 60-80% of OTC contracts could be centrally cleared, driven by greater standardisation, and the increase in trading book capital charges under Basel III. Although the final Basel III rules are still being considered, the current track could incentivise the clearing of contracts even with exempt counterparty types, i.e. corporates. The creation of central clearing is likely to be a longer-term process even once definitions have been confirmed, as existing contracts are back-loaded and clearing houses have historically been poor at adding increased functionality. By 2012/13, we expect 40-50% of total annual traded volume of OTC contracts to be centrally cleared (see Exhibit 19).

Exhibit 19

Forecast of centrally vs. non-centrally cleared global value traded in OTC derivatives (2012/13, USD tn)



2012E level of standard-isation	~85%	~70%	~70%	~50%	~45%

Source: Oliver Wyman

We expect that a distinct, asset-class specific model will emerge for the clearing of OTC contracts.

- **The natural separation between listed and OTC derivatives is unlikely to disappear,** since key differences in risk management and position valuation limit the scope for cross product efficiencies (e.g. in terms of IT platforms & operations, default fund management and margin relief).
- **Within the OTC market, the unique characteristics of each asset class and the benefits of scale will lead to few CCPs per asset class** (likely on a regional or national basis) to take advantage of margining and cost efficiencies.
- **For now, the trend appears to be towards a relatively fragmented asset class specific model,** as incumbents and new entrants seek to establish themselves in the new regulatory world. LCH.Clearnet's recent announcement to launch Swapclear in the US is evidence of growing competition within asset classes to secure a share of the new revenue pool.
- **As a result of specialisation, there may be consolidation in the medium to long term –** especially in the still highly fragmented European CCP landscape, though we expect the European CCP landscape to remain more fragmented than in North America.

A key driver for asset-class specific CCPs is the range of benefits that can be realised from a specialised clearing model, which should outweigh the costs:

- **(+) Margin savings:** In an ideal scenario, there would be no need to deposit margin with multiple CCPs per asset class, implying a lower aggregate margin requirement.
- **(+) Default fund savings:** Total contribution to various default funds is lowered as a result of fewer CCP relationships.
- **(+) Admin cost savings:** Fewer CCP relationships to be administered, with particularly large effects for GCMs and other large clearing members.
- **(+) Fee advantages:** Clearing fee advantages may result from the concentration of liquidity and possible CCP economies of scale – especially if CCP fees are subject to regulatory controls.
- **(-) Cross-margining:** CCP specialisation by asset class puts limits on cross-margining between asset classes.
- **(-) Limitations to netting efficiency:** Limited possibility for netting trades off between CCPs, affecting costs for end users.

But there are also risks from such a concentrated CCP market structure:

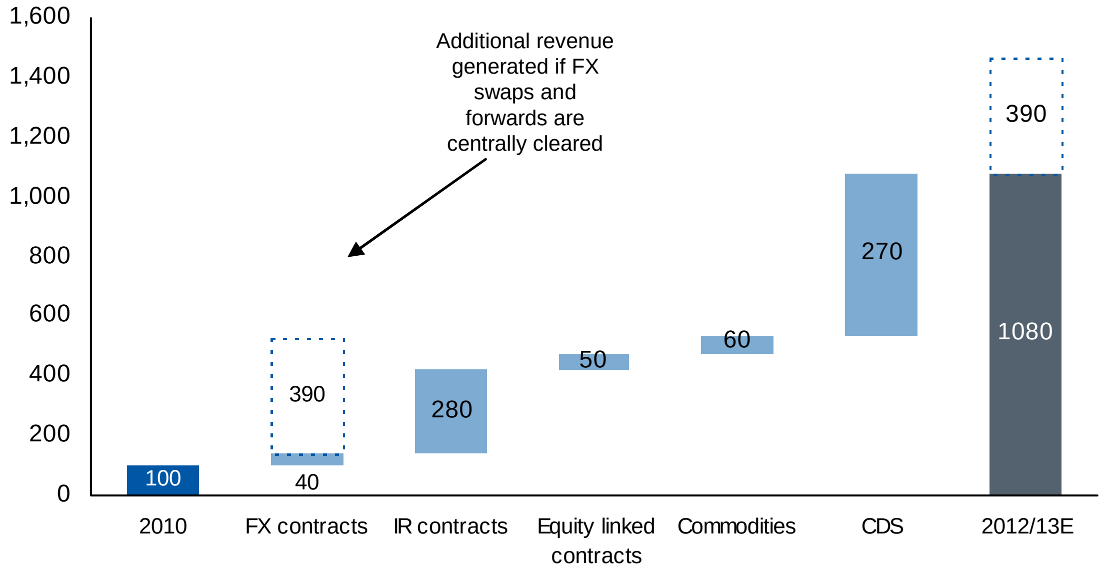
- **Concentration risk** – fewer CCPs implies a concentration of systemic risk among a relatively small number of institutions. This may lead regulators to authorise a larger number of CCPs to reduce the likelihood of major systemic crisis in the event of a large default.
- **Domestic concerns** – single, regional / global CCPs per asset class may also create concerns around responsibility for assistance in the event of another crisis. For example, US regulators may push to have European US dollar swap contracts cleared by a US clearing house, to avoid the currency implications of having a foreign central bank as lender of last resort for a CCP clearing dollar contracts.

Overall, we expect the introduction of mandatory central clearing to drive OTC derivatives clearing revenues to ~$1 bn by 2012/13 depending on the speed of regulatory implimentation (see Exhibit 20) – more than double the total OTC derivatives clearing revenue pool in 2009-2012. This revenue pool is based on a profit-making business model and could be lower under a more utilitarian CCP structure (discussed in more detail below).

In the short to medium term, clearing houses will need to invest in infrastructure before cleared volumes have fully developed, but those that can gain scale in specific asset classes could generate sizeable revenue as volume concentration increases and pricing models become aligned with value propositions.

Exhibit 20

We see sizeable revenue pools for global OTC clearing (2010-2012/13E, USD m)



Source: Oliver Wyman estimates

Nevertheless, lack of clarity on regulation poses a risk to this revenue stream. As requirements become clearer, there are a number of additional factors that could diminish the revenue pool from OTC clearing:

- Observed trends in the market generally suggest price margins increase as participants are forced to use CCPs. However, if the CCPs remain fragmented, competition could begin to squeeze margins.
- Volumes going through CCPs will not be legislated; rather the initial impetus for OTC clearing is likely to be the expected increase in counterparty credit charges in the trading books under Basel III.
- Although we expect CCPs to align to asset classes on a regional basis, and regulators to broadly converge on legislation, there is unlikely to be a single global CCP structure, given oversight and implicit “too big to fail” complications.

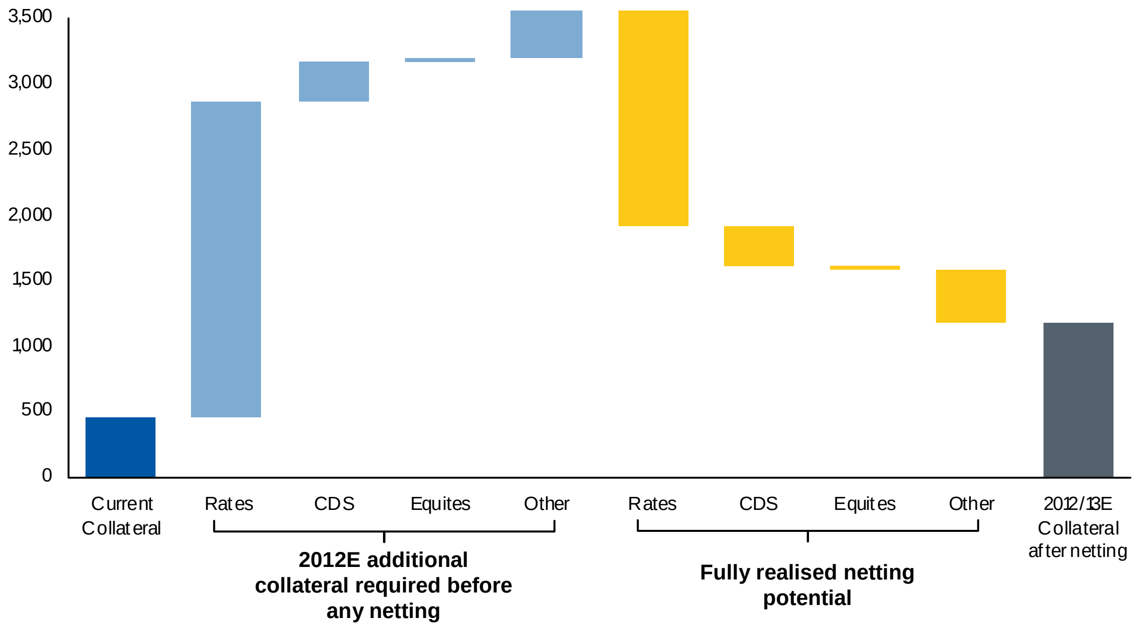
In our view, the main driver for clearing will not be purely regulatory prescription, but the introduction of Basel III and the increase in counterparty credit RWA charges in the trading books. The recent Basel III ruling on the treatment of CCP cleared OTC derivatives has dictated that dealers mark to market and that collateral exposures to a CCP be subject to a modest risk charge, proposed at 2%. Capital requirements for derivatives overall will increase significantly, due to punitive risk charges for non-standardised/uncleared contracts, with an expected 2-3x increase in overall RWAs further incentivising the dealers to push for clearing of contracts (regardless of counterparty type). In fact, we estimate potential new margin requirements in the system could be nearly $3 trillion if banks are to push most corporates to centrally clear trades to reduce counterparty risk RWAs.

Multilateral netting through clearing does, however, have the potential to reduce collateral / margin requirements for centrally cleared OTC contracts, which we estimate could be as high as 70-80% overall. Based on current levels of collateral for centrally cleared and bilateral OTC trades of $400-450 bn, we estimate the shortfall in collateral required between now and 2012 at around $2-2.5 tn. However, varying the potential for multilateral netting via CCPs across asset classes could reduce total margin requirements to as little as ~$0.8-1 tn in a best case (see Exhibit 21). Full realisation of the potential netting is highly unlikely, as a single CCP per asset class would need to exist to fully net positions. The variability of the final new margin in the system is extremely wide and depends on both CCP model and Basel III.

The efficiency of multilateral netting will depend on the emerging CCP market structure and regulatory framework. The more fragmented the space, the more limited the netting benefits outlined in Exhibit 21.

Exhibit 21

Estimated margin requirements for centrally cleared OTC derivatives, 2012/13E in USD BN



Source: Oliver Wyman estimates

According to a recent CFTC proposal, mitigating regulatory action should start by defining systemically relevant and non-relevant CCPs (see Exhibit 22). The final rules are unclear, but we expect systemically relevant CCPs to be subject to stricter capital rules, KYC/AML requirements and risk management obligations.

Exhibit 22

Proposed treatment of systemically relevant CCPs in the US (CFTC)

Item	DCOs (Derivatives Clearing Organisations)	SIDCOs (Systemically Important DCOs)
Default resources	▪ DCOs required to maintain sufficient financial resour-ces to meet financial obligations to clearing members – Notwithstanding a default by the clearing member creating the largest financial exposure to the DCO in extreme but plausible market conditions ▪ Financial resources permissible to meet requirement include margin of a defaulting clearing member, DCO capital, guarantee fund deposits and default insurance ▪ Value of assessments subject to a 30% haircut w/ DCO only permitted to count value of assessments after the haircut to meet up to 20% of the requirements	▪ SIDCOs required to maintain sufficient financial resources to meet financial obligations to clearing members – Notwithstanding a default by the clearing members creating the two largest financial exposures for the SIDCO in extreme but plausible market conditions ▪ Same principles with respect to financial resources as for DCO – However, SICDO not able to count value of assessments to meet obligations from default by largest, but only by second largest clearing member
Operating resources	▪ DCO to maintain sufficient, unencumbered liquid financial resources to cover operating costs for at least one year	
Reporting	▪ Obligation to report to Commission at least each fiscal quarter or at any time upon request – Items to be covered include in particular the amount of financial resources required to meet regulatory requirements, the value of each financial resources and the value of individual member guarantee fund deposits – Provision of financial statements to Commission also mandatory, i.e. balance sheet, P&L & cash flow statement	
Special certification procedures	▪ Not applicable since the failure of a DCO to meet its obligations anticipated to have a lesser impact on the financial system than that of a SIDCO	▪ Provision of 60-day advance notice of any proposed changes to rules, procedures or operations that could materially affect nature or level of risks for the SIDCO – E.g. rule changes substantially affecting financial resources, participant and product eligibility, risk management, settlement or default procedures, disaster recovery, or governance

Source: Oliver Wyman

Emergence of trade repositories as utilities

Another aspect of reforms to improve post trade and position transparency and provide a comprehensive view of systemic risks is the requirement that all derivatives transactions (cleared and bilateral) be reported to trade repositories.

However, we do not see repositories as an attractive revenue pool. Rather, we expect a utility model to emerge, with trade repositories performing the core function of data capture and reporting, but operating effectively on a not-for-profit basis.

Proposed EU regulations require trade repository fees to be cost related and prohibit the commercial use of trade repository data by parents or subsidiaries. Similarly, US proposals prohibit the use of trade data for commercial purposes unless consent is obtained from the regulator.

Trade repositories are therefore likely to resemble the DTCC’s trade information warehouse (“TIW”) that holds CDS trade data on a global basis, and recently received approval to set up a similar warehouse for equity derivatives or TriOptima’s version for IR swaps. Both will likely be made to make data available to both domestic and international regulators.

Ultimately we still see scope for pre- and post-trade analytics providers to emerge, leveraging the data gathered by the repositories. We would certainly expect the major broker-dealers to look to offer new content-related services based on this data, and could see the major information providers (Thomson-Reuters, Bloomberg, MarkIT), smaller firms and new entrants create innovative new offerings in this area.

A number of issues remain to be addressed in the final regulations for trade repositories (see Exhibit 23), and although the EU regulatory timeline is lagging by about six months to a year behind the US, the regulators seem to be converging on similar regimes. One key difference is the mandate for real-time public reporting in the US, which has not yet been replicated in Europe (where trades must be reported within one working day).

Exhibit 23

Trade repositories: regulatory debate and EU vs. US comparison

	Overview of issue(s)	Comparison EU vs. US
Number of trade repositories	▪ DTCC in the US is pushing for single, global repositories per asset class – Ensures single global view, seen as crucial for systemic risk oversight – Data completeness more likely as no need to determine which repository to record data with (or obtain it from) esp. where contracts span multiple jurisdictions – Promotes efficient and timely access to information for regulators at lower costs ▪ However, trade repositories already exist and there is already a certain degree of fragmentation across jurisdictions/asset classes – Double reporting and/or inter-connected repositories may offer alternative solutions	
Granularity of information	▪ In order to ensure regulators can leverage repositories to achieve intended transparency and financial stability outcomes, both aggregate and trade-level data may be required – Trade-level data require an understanding of market evolution/liquidity – But aggregate position-level data is crucial to ensure sufficient oversight of systemic risk at e.g. counterparty, geographical, asset class level	▪ EU currently proposes to collect counterparty and beneficiary names, main characteristics of the contract (type, underlying, maturity, notional value), w/ data to be stored for at least 10 years ▪ CFTC will require repositories to hold individual counterparty trade and position data but has not fully specified data fields
Reporting and record-keeping	▪ Parties required to supply data to repositories – Requiring all trades to be reported would impose requirements on corporates using derivatives for hedging purposes (US proposal) – Position threshold may be practical but risks incomplete view of the systemic risk (EU proposal) ▪ Frequency, timeliness and granularity of reporting – E.g. ability to report within specified timeframes is an area of concern, particularly where complex contracts are time consuming to negotiate and the point of comple-tion is difficult to identify	▪ Both EU and US would require trades to be reported directly to regulator if they cannot be reported to a trade repository ▪ EU requires reporting within one working day, whilst CFTC has mandated 'real-time' reporting ▪ Current EU proposal is to require repositories to publish aggregate positions by asset class and to set a position threshold for reporting (vs. all participants in the US)
Foreign trade repositories	▪ Practical and legal concerns around potential breaches to confidentiality rules due to information sharing ▪ Jurisdictional differences may indeed require legislative change to achieve intended outcomes and circumvent potential legal hurdles regarding confidentiality and privacy laws in different countries	▪ Both EU and US regulators currently allow for the recognition of foreign trade repositories and appropriate information sharing arrangements between them

Source: Oliver Wyman

An example of convergence is the intention both in the US and Europe for trade repositories to analyse aggregate positions by asset class and reporting entity / counterparty. This raises a number of concerns around the impact of transparency on large dealers and end users. Regulators will need to consider these carefully in balancing their desire for transparency and public reporting with the need to ensure stable and functioning markets. In the US, the CFTC is currently not permitted to publish position or transaction data, though trade repositories must provide it to them. In Europe, where there is no trade repository system in place yet, this could be achieved by requiring repositories to make publicly available aggregate positions by asset class only (i.e. not counterparty), with all other data available to relevant regulatory authorities only. Probably the most complex issue facing regulators is determining the appropriate structure of the end-state trade repository landscape, with the key question being whether there should be single repositories per asset class, and whether these should be global or regional.

There is also a push for single, global repositories per asset class. DTCC for example claims that this would provide cost, accuracy and efficiency benefits (see Exhibit 19). It is still unclear whether such a model of single, global repositories will emerge in the end-state. Systemic risk concerns may outweigh the benefits of efficiency and data quality. There is significant risk associated with concentrating trade data with few players, and the market impact of the collapse of a data repository could be significant. Both models are developing in the market at the moment. For example, DTCC is planning to replicate its TIW in Europe, giving rise to a single CDS repository with the same data housed in both continents. In the interest rates space, however, BME and Clearstream recently launched REGIS-TR, a European trade repository (with potential for global scope) currently covering interest rates but planning to expand to other asset classes in the future. Again recently launched, TriOptima's rates repository is intended to be global and therefore likely to cross-over with the coverage of REGIS-TR. In addition, CCPs are likely to become natural repositories for centrally cleared trades, which could lead to an additional fragmentation of trade repositories, particularly if numerous CCPs emerge across asset classes and jurisdictions.

The emergence of trade repositories and resulting market structure will also present a number of challenges for regulators:

- **Significant resources required.** Regulators are requiring repositories to give them direct electronic access as well as public/regulatory reports, implying that they will need to have the infrastructure and operational capabilities to link up to repositories. In addition to this technological hurdle, authorities will need to ensure they have the resources and technical expertise to make use of the data and deliver the intended transparency and risk monitoring benefits. This may be of particular concern given the recent announcement by the CFTC's Chairman that technology budget cuts may be enforced this year.
- **Either form of the end-state market structure will require regulatory coordination.** Single, global repositories by asset class will require consolidated supervision across jurisdictions (e.g. a lead supervisor arrangement). Under a more fragmented landscape, regulators will need to ensure sufficient operational alignment to allow data from multiple repositories to be compared and aggregated.

Consolidation and expansion of European CSD/ICSD franchises

The European market for securities servicing has been transformed by a number of regulatory initiatives aimed at overcoming inefficiencies in cross-border trading. The latest among these is the TARGET2-Securities (T2S) project, recently launched by the Eurosystem, which comprises the European Central Bank (ECB) and the central banks of EU member states that have adopted the Euro. T2S is intended to provide a standard settlement and clearing process in central bank money for all Euro-denominated securities, and is expected to go live in 2013/2014.

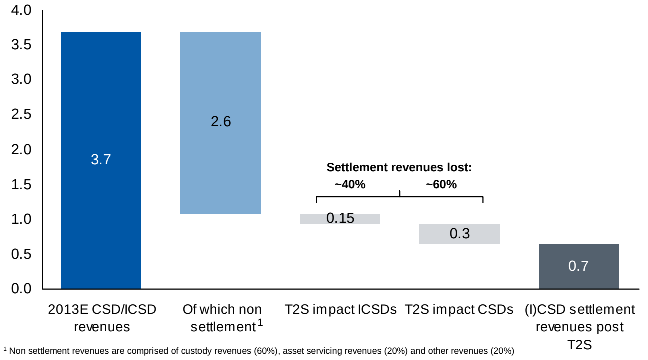
While the entities most obviously and directly affected will be the Central Securities Depositories (CSDs), which will be required to outsource their settlement functions to the new system, T2S has implications for all participants in the post-trading market. Broadly, we expect it to increase price transparency and competition in the post-trade market, benefiting the buy-side and encouraging consolidation on the sell-side.

The direct effect of T2S will be to shrink European CSD/ICSD revenues as a result of outsourcing settlement from national CSDs to a pan-European platform. As shown in Exhibit 24, we see this as relatively contained downside, with the loss of $0.4-0.5 bn in revenues.

In addition, a number of CSDs expect asset servicing revenues to suffer from reduced settlement revenues. Global and sub-custodians will also be affected by T2S, although to a lesser extent, as they are less reliant on settlement revenues. These players can also expect increased competition from (I)CSDs seeking to encroach upon the custodian business model. Although investors and their agents will continue holding accounts with their national CSDs, users will be able to access T2S indirectly via a CSD. At the same time, CSDs will continue acting as central "registrars" and provide ancillary ("non-lean") activities, in particular asset servicing.

Exhibit 24

Expected revenue impact of T2S on European CSDs/ICSDs (2013, USD bn)



[1] Non settlement revenues are comprised of custody revenues (60%), asset servicing revenues (20%) and other revenues (20%)

Source: Oliver Wyman

We expect the following moves in the European CSD/ICSD landscape as a result of T2S game changes:

1. **Increased margin pressure on smaller players could trigger CSD consolidation**, which could entail a break-up of the current national CSD model in exchange for cross-border franchises. In the medium term, we expect the number of European CSDs to fall by 30-40% from ~30 to a maximum of 20 in a post T2S world. This will also affect the CSDs that have already signed the T2S MoU, in particular those not included in the Link Up Markets initiative.

2. **CSD/ICSD franchises are likely to expand** to gain access to new revenue pools to offset revenue losses from T2S. There are two key areas of expansion beyond the current core settlement and custody model: banking services (e.g. cash management) and collateral management. We anticipate the share of these services in the European CSD/ICSD industry to account for 30-40% of revenues post T2S (up from a 2009 share of 20-30%).

   In collateral management specifically, we see three major axes along which CSDs/ICSDs can expand their franchises:

   - **Geographic focus:** bundling of collateral for a distinct asset class in one location, with facilitation of tri-party collateral management.

- **Product range:** transforming buy side posted collateral into CCP eligible margin collateral (e.g. cash / govies). Possible for (I)CSDs to gain here, with strong synergies with OTC derivative exposure management, mitigation and data repository services.
- **Client focus:** Corporates are an untapped potential client base. Hedge funds and IDBs are also underpenetrated by the (I)CSDs.

3. **European CSDs will continue tapping into Asian markets,** thereby enhancing daytime servicing windows and moving towards an increasingly integrated settlement and collateral management landscape. ICSDs are naturally favoured in this context, competing against leading global custodians. National CSDs will struggle to keep pace, and might be better advised to focus on deepening their asset servicing penetration in home markets.

4. Given recent debate on CSD membership for new groups of players beyond the traditional ones, i.e. banks, regulators, custodians and other financial institutions, we expect further impact from US markets on global CSD models. This could lead to direct connectivity of the buy-side and potentially corporates in certain jurisdictions in the medium term, increasing European (I)CSD revenue pools.

5. **This would imply fundamental changes to risk management models and supervision,** requiring CSDs to introduce dedicated service lines per membership category. The US example shows that this is possible but presents operational challenges, especially in relation to risk management and reporting capabilities.

Stabilisation of custodian revenues from regulatory reform and custody+ and hedge fund+

Global custodians' total revenues shrank by 8% in 2009 (with direct custody-related revenues remaining flat), driven by the interest rate environment, lower equity market valuations and continued margin pressure. EMEA suffered the greatest revenue decrease, but other regions' revenue pools were also clearly affected. Custodians are hence under significant pressure to seek out new business opportunities to compensate for stagnation and/or revenue losses in their traditional businesses, especially in core custody.

Potentially surprising, the ongoing regulatory reform debate could come as a white knight to custodians, presenting them with new business opportunities. These opportunities are mainly around the OTC derivatives reform, Basel III and T2S, as highlighted in Exhibit 25.

Exhibit 25

Regulatory reforms and potential implications

Regulatory reform	Potential positive implications
OTC derivatives reform	▪ Significant pressure on client (especially sell-side) business models ▪ Need to review CCP connectivity and related processes ▪ Likely increase in demand for collateral management services
Basel III	▪ Possible streamlining of asset class coverage towards standardized OTC derivatives ▪ Opportunity for price differentiation due to new requirements with respect to initial vs. variation margin
T2S	▪ Need for establishing dedicated links with leading CCPs for movement of cross-border assets ▪ Possibility of providing the market with alternative to exchange settlement & custody

Source: Oliver Wyman

We expect continued growth in buy side and hedge fund demand for pre-trade transparency, valuation and market data, and frequency and sophistication of collateral management needs.

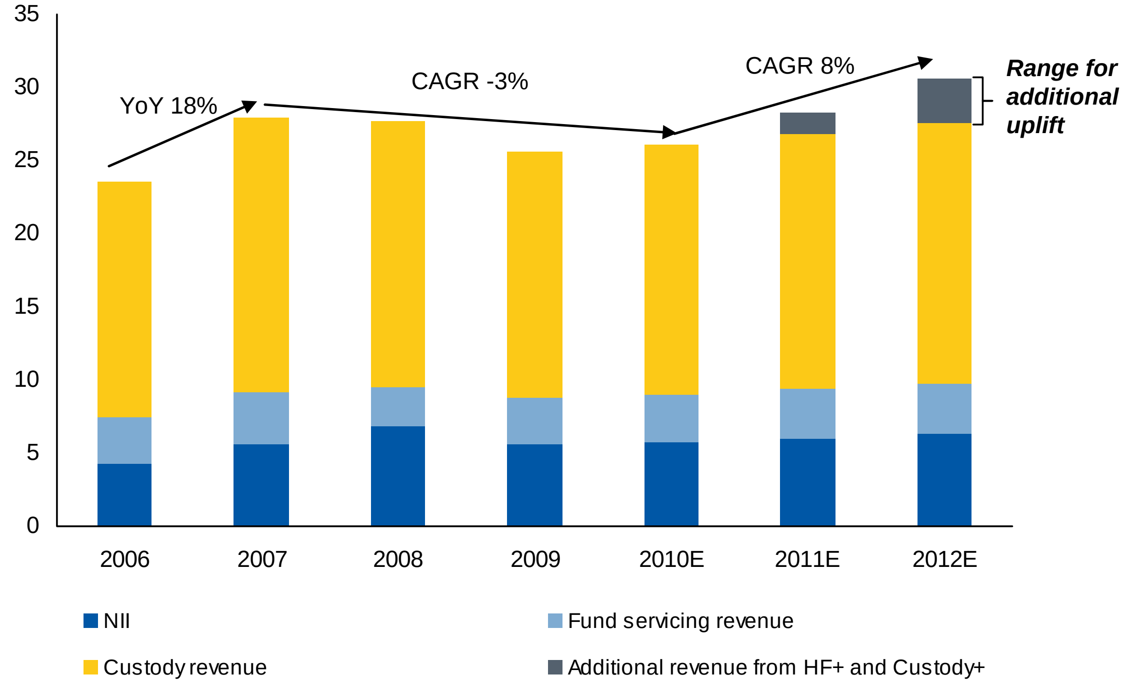
- Risk measurement and analysis is of highest importance to funds, and they frequently make use of third party solutions.
- Funds also indicate concern over receiving accurate valuations, and many have built in-house systems to mirror work by external providers.
- Segregated collateral remains an area of focus for hedge funds as they seek increased asset protection.

Global custodians should consider positioning themselves for enhanced custody+ and hedge fund+ strategies in standardised OTC derivatives. A number of products are currently of interest to hedge funds, in particular:

- illiquid financing, which is becoming less cost efficient with the large prime brokers, owing to funding and capital pressures;
- synthetic access to closed markets, i.e. Chinese A share, etc.

Exhibit 26

Global revenue potential from custody+ and hedge fund+ expansion (in USD bn)



Source: Oliver Wyman

The revenue potential for global custodians from expansionary moves is attractive (see Exhibit 26), assuming accelerated growth of AuC and some (though limited) margin increases from more sophisticated and tailor-made solutions for OTC derivatives. However, we consider the risk management and operational impact as comparably high, and investment cases will require careful investigation for sensitivities and cost impact. That said, some of these new revenue streams might soon be contested, as IDBs continue positioning aggressively as new generation post trade providers.

Custodians will need to link new custody+ and hedge fund+ offerings with existing offerings to limit investment costs. In particular, they will have to focus on specific areas to be suitably placed to offer services to hedge funds:

- expansion towards a wider choice of investment assets and associated capabilities, in response to the highly varied portfolios of hedge funds;
- investment in technology infrastructure for accurate valuation and reporting, driven by regulation and investor demands; and
- significant upgrade in risk management to comply with regulatory / client standards, and to cope with the increase in technological dependence.

This may pose a particular challenge for some custodians, as the required core banking and risk management capabilities may require upgrading. At the same time, they will need to develop more client centred service lines to expand risk management and collateral management revenues. Especially in the latter area, we see similar opportunities as for (I)CSDs, with custodians potentially better placed to adapt to specific requirements of the OTC markets.

Regulatory reform provides an opportunity for complementing existing collateral management offerings, e.g. through transformation capabilities. The increasing demand for collateral management services is coming from both sell-side and buy-side clients:

Final remarks

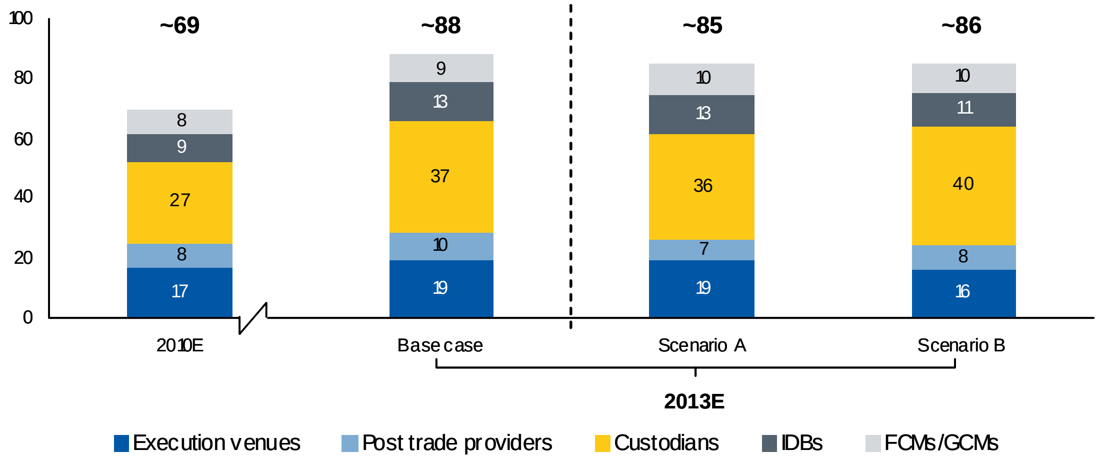
Following the trajectory of development of the infrastructure space, our base case scenario is one of incremental change:

- US and European cash equities exchanges remain under significant pressure from the continued rise of ATVs and a loss of erosion of both volume share and pricing power.
- Derivatives exchanges retain their current "defensible" revenue streams, but are increasingly challenged to defend open interest against migration to other venues, replicating on-exchange structures.
- In the execution layer of OTC, the multi-dealer request for proposal models emerges, shifting some control from the dealers to IDBs, trading platforms, and exchanges. However a two-tiered pricing structure remains in place, as it is today.
- A large share of OTC derivatives is centrally cleared by 2012, with eligibility driven mainly by the level of product standardisation. A two-layered, asset class driven CCP model emerges, initially separating on-exchange and OTC clearing.
- T2S shrinks European (I)CSD revenues by up to ~60% in the medium term, but first movers expand their franchises into new revenue pools, centred on banking services and collateral management.
- Global custodians explore additional revenue pools in custody+ and hedge fund+ for OTC derivatives.
- Industry consolidation continues, driven by technology synergies, post trade expansion and partnership with clients, but value creation is limited.

Alternatively, given the regulatory uncertainty, a number of alternative scenarios could emerge. We estimate growth in total revenue pools at 6-8% CAGR through 2013, however the distribution between segments varies dramatically (see Exhibit 27).

Exhibit 28

The Future of Market Infrastructure – development scenarios



Impact	Base case	Scenario A – 'Lack of uptake of CCPs in OTC'	Scenario B – 'Extreme transparency'
Overview	▪ Incremental change across the industry	▪ Regulators soften stance on central clearing of OTC in response to liquidity & cost concerns ▪ Slow migration to central clearing and standardisation of contracts	▪ Reg reforms force transparency and access into listed through harmonisation & consolidation ▪ Regulatory reform forcing OTC into CLOB structure limiting liquidity and forcing flow onto exchange
Execution venues	▪ Equities execution venues remain under pressure from the continued rise of ATVs ▪ Cash exchanges continue to experience loss of volume share and pricing erosion ▪ Derivative exchanges continue to grow as OTC volumes migrate	▪ Cash exchanges still under margin pressure from ATVs revenue growth still difficult despite resurgent volumes ▪ Limited / no migration of OTC volumes to exchange-like platforms ▪ Little OTC volumes migrating to SEFs	▪ Cash exchanges under continued pricing pressure – MTFs taking share though volumes rising ▪ Trade size still falling ▪ Breakdown of listed derivatives vertical structure ▪ Cannibalisation of OTC volumes by listed derivatives exchanges
Post trade providers		▪ Limited growth opportunities as margin pressure continues due to increased vertical offerings ▪ No real volume growth as OTC products remain largely bi-laterally cleared & margined ▪ Pricing under pressure – revenues off	▪ Decreasing OTC liquidity impacting pricing & margin rates (treasury revenues) ▪ Cash still unprofitable ▪ Listed derivative CCPs forced to clear across execution venues increases clearing revenues (at a cost to execution revenues)
Custodians	▪ AuC growth with volume growth	▪ Little overall change from today – growth with NII & volume ▪ Decreased long term opportunities in OTC products	▪ AuC growth with volume growth ▪ Growth with NII & volume ▪ Little impact of adjacent services (Hedge Fund+ & Custody+)
IDBs	▪ Multi-dealer RFQ model emerges shifting control from dealers to IDBs	▪ Less cost implications for regulatory compliance ▪ Voice brokerage model still in place – better pricing margins	▪ Increasing interest in open architecture / access ▪ Decreased pricing margins from electronification
FCMs /GCMs	▪ Slack in new volume growth, loss of influence vs. exchanges	▪ Little overall change from today ▪ Decreased long term opportunities in OTC products	▪ Little overall change from today

Source: Oliver Wyman

Overall, we believe industry change will be paced as regulators have an interest in keeping the main components of the system intact, and dramatic changes could have unintended consequences. However, capital markets infrastructure is in a period of change, and it is clear that increasing transparency in both listed and OTC – coupled with business model convergence and industry consolidation – will have altered the landscape by 2013. The shift of power . from the dealers / balance sheet players into the infrastructure providers provides unprecedented opportunity for the space to redefine its role in the global financial system as well as develop new revenue opportunities and strategic trajectories. However the winners and losers remain to be seen.

Glossary

IDB	Inter-dealer Broker
SEF	Swap Execution Facility
OTC	Over the Counter
MTF	Multi-lateral Trading Facility
ATV	Alternative Trading Venue
FCM	Futures Commission Merchant
GCM	General Clearing Member
CCP	Central Counter-Party
(I)CSD	Central Securities Depository
OTF	Other Trading Facility
HFT	High Frequency Trading
T2S	Target2Securities
CFTC	Commodity Futures Trading Commission
SEC	Securities and Exchange Commission
MiFID	Markets in Financial Instruments Directive
EMIR	European Market Infrastructure Regulation

Part 2 – Valuation and Recommendations

Part 2 of this report solely reflects the views of Morgan Stanley Research, not Oliver Wyman.

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