

Trends in the Global Capital Markets Industry 2012: Financial Intermediary Firms

**Key emerging trends in financial intermediary firms and their implications for
global capital markets**



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Table of Contents

1. Highlights	3
2. Introduction	4
2.1. Global Capital Markets Players	4
2.2. Global Capital Markets Performance	4
3. Emerging Trends in Global Capital Markets: Financial Intermediaries	6
4. Trend 1: Exponential Growth in Data Output Intensity	8
5. Trend 2: Increased Importance of Swap Execution Facilities (SEFs) in Derivatives Trading	11
6. Trend 3: Rise of Global Alliances	14
7. Trend 4: Continued Focus on Technology Infrastructure Upgrades	16
References	19

1. Highlights

As a result of the ongoing debt crisis in the Eurozone and slowing growth in emerging markets, such as India and China, 2011 turned out to be a relatively difficult year for global capital markets. Most of these macroeconomic issues also persisted in the first half of 2012.

In 2011, low confidence led investors to shy away from the riskier equity markets and look for relatively safer bets in the debt markets. Interest in commodities increased among fund houses due to their ability to act as risk diversification tools. Gold emerged as the biggest beneficiary of this trend and continued its bull run in 2011.

2011 was a mixed year for financial intermediaries. Equity capital raised through secondary offerings witnessed declines in all regions. Capital raised through primary markets grew by 27.4% in the Americas, reflecting some recovery from the financial crisis, but declined in all other regions. The number of equity trades increased in Europe due to higher high frequency trading (HFT) activity, but declined in the Americas and the Asia-Pacific regions. The value of equity trading remained fairly stable with respect to the previous year, owing mainly to stable electronic order book trading at NYSE Euronext and NASDAQ OMX which together account for nearly half of the global value of equity trading. In fixed income markets, the growth in the *value* of bond trades was much higher compared to the growth in the *number* of bond trades, signifying greater institutional interest in fixed income products.

The financial intermediaries' ecosystem is currently in a state of flux. Increased volatility, higher reporting obligations, and competitive pressure are resulting in an exponential rise in market data volume. Cost and scale considerations and competitive pressure are forcing intermediaries to forge innovative global alliances. Evolving customer demands for multi-asset and multi-geography trading, the rise of high-frequency trading, and regulatory pressure are driving increased investment in infrastructure upgrades. Even the market structure of the financial intermediaries industry is expected to change with the rising prominence of swap execution facilities. All of these structural changes are expected to have a profound impact on the business and technology strategies of financial intermediaries in the coming years.

2. Introduction

2.1. Global Capital Markets Players¹

Global capital market players can be broadly divided into three core categories:

- **Buy-Side Firms:** Mutual funds, hedge funds, pension funds, unit trusts, proprietary trading firms, and private equity
- **Sell-Side Firms:** Investment banks, brokerage houses, and independent analysts
- **Financial Intermediaries:** Stock exchanges, clearing houses, and custodian banks

This paper reviews and summarizes the key trends for financial intermediaries, and their implications for the industry as a whole.

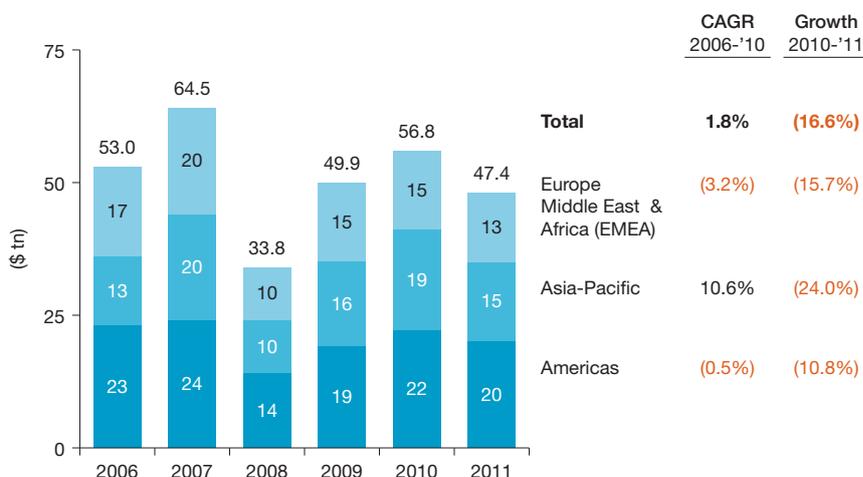
2.2. Global Capital Markets Performance

As a result of the ongoing Eurozone debt crisis and slowing growth in emerging markets such as India and China, 2011 turned out to be a difficult year for capital markets.

Global equity market capitalization declined 16.6% or \$9.4 trillion in 2011, as the sovereign debt crisis in the Eurozone weakened investor sentiment. Asia-Pacific however, was the worst-affected market with its combined market capitalization falling by around 24% during the year.

Markets in Europe, the Middle East, and Africa collectively fell by 15.7% due to investor concerns around growth prospects of the Euro Zone. The very existence of the euro was questioned leading to investors becoming underweight of European equities. Equity markets in the Americas however emerged as the notable exception and outperformed other regional peers despite the S&P downgrade of the U.S. This was due to relatively poor fundamentals of Europe and slowing emerging markets in Asia-Pacific.

Exhibit 1: Global Equity Market Capitalization (\$ trillion), 2006–11



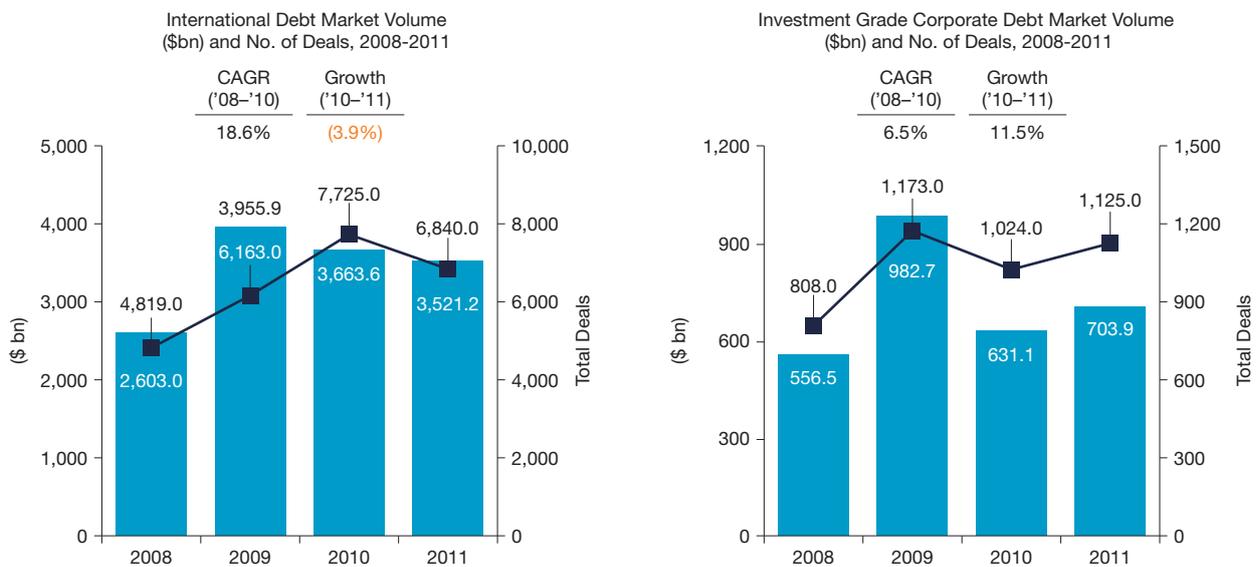
Source: Capgemini Analysis, 2012; World Federation of Exchanges, 2012

¹ Wealth management and private banking are covered in a separate paper within our *What You Need to Know* series

The government bond market witnessed slow activity in 2011 due to excess supply from government auctions. International debt market volume declined 3.9% to \$3,521.2 billion from \$3,663.6 billion in 2010. Euro-denominated bonds were the worst impacted and witnessed their volumes decline by 51.3% to \$81.8 billion in 2011 from \$168.1 billion in 2010. Non-resolution of the sovereign debt crisis, looming recessionary fears in several major Eurozone economies, and already high levels of public debt of certain peripheral European nations (Portugal, Ireland, Italy, Greece, and Spain) dimmed investor interest in government bonds and were the primary reasons behind the fall in volumes.

On the other hand, corporate bond issuance grew in 2011 despite higher yields, as firms chose the debt route over depressed equity markets. Volumes of investment grade corporate debt grew 11.5% from \$631.1bn in 2010 to \$703.9 billion in 2011. The volumes of high-yield corporate debt, on the other hand, declined 9.5% from \$306.8 billion in 2010 to \$277.8 billion in 2011 due to investors' proclivity to avoid risky investments. Worsening economic fundamentals resulted in more companies falling under the high-yield bonds category during the year.

Exhibit 2: International Government Debt and Investment Grade Corporate Debt, Market Volume (\$ billion) and Number of Deals, 2008–2011



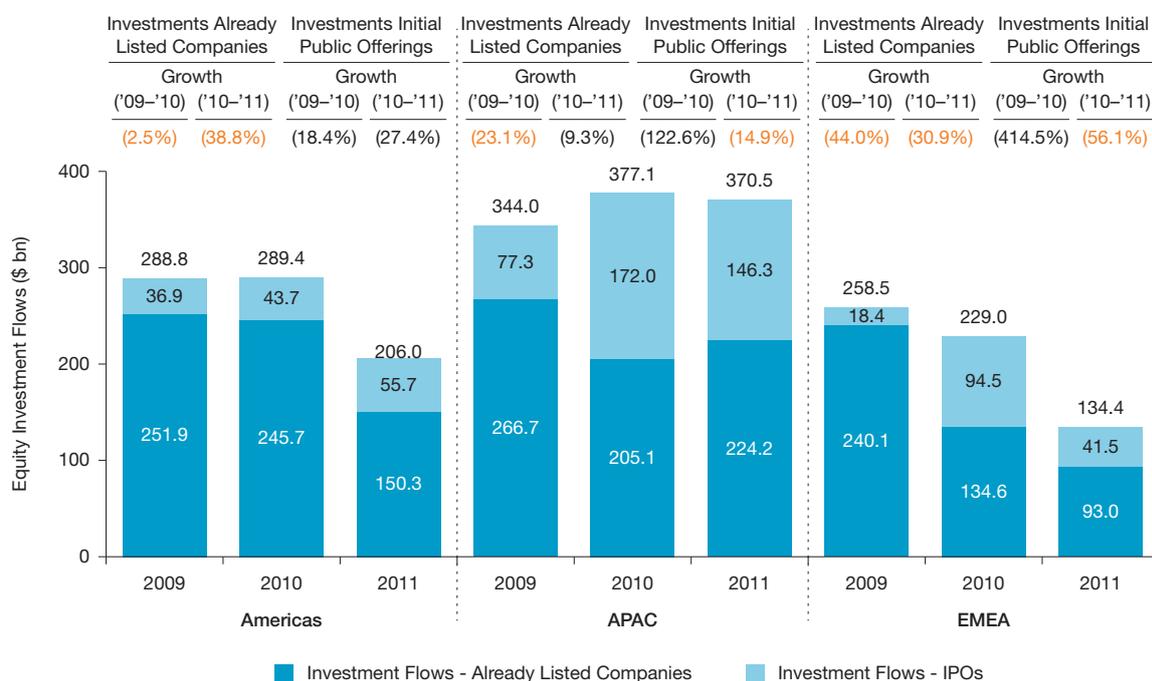
Source: Capgemini Analysis, 2012; Market Data Q2 2012, International Capital Markets Association

Commodities funds continued to see growth in 2011, driven by new investors interested in this asset class as a portfolio diversification tool. Unrest in the Middle East and demand from emerging markets made energy the most preferred commodity bet for commodity-based investment funds. On the other hand, fears of sovereign debt contagion helped gold continue its run with a huge demand for funds tracking gold as a commodity. Fears of a double-dip recession and an overall slowdown in the European economy halted the growth for funds invested in base metals. Several base metal commodities such as copper and lead corrected significantly on the London Metal Exchange due to subdued physical demand.

3. Emerging Trends in Global Capital Markets: Financial Intermediaries

Capital raising activities remained lukewarm in 2011, and capital raised by listed companies through secondary markets declined sharply in developed markets. Also, with the exception of North America, which registered a slight recovery from the financial crisis of 2008, all regions witnessed sharp declines in capital raised through IPOs in 2011. The North America exception was due to large IPOs of the social networking sites Facebook and LinkedIn.

Exhibit 3: Equity Investment Flows (\$ bn), 2009–2011²



Source: Capgemini Analysis 2012; World Federation of Exchanges, Aug 2012

With the exception of the Americas, which registered a slight recovery from the financial crisis of 2008, all regions witnessed sharp declines in capital raised through IPOs in 2011.

Trading in equities delivered mixed results, with the number of equity trades declining by 5.5% between 2010 and 2011. The sharpest decline in the number of equity trades was witnessed in Asia-Pacific (down 10.5%) and the Americas (down 3.4%). In contrast, increased HFT activity in Europe led to the number of equity trades there increasing by 17.3% during 2011.

The value of share trading, on the other hand, remained fairly stable despite a fall in market capitalization witnessed in most regions. This was largely due to the stable Electronic Order Book (EOB) turnover value at NYSE Euronext (U.S.) and NASDAQ OMX U.S., which together account for nearly half of the global EOB value of share trading.

² EMEA stands for Europe, Middle East and Africa

Regulations are evolving at a rapid pace and are expected to have considerable business impact on financial intermediaries.

Due to the sovereign debt crisis, investors continued to look for safe investment vehicles, leading to an increased interest in fixed income securities. The highest increase in the number of bond trades (up 82.8%) was observed in the Americas, signifying that investors are yet to fully regain their confidence in the equity markets. Asia-Pacific on the contrary, witnessed a 20% decline in the number of bond trades. Bond markets in EMEA remained stagnant in 2011, and the number of bond trades in the region grew by only 1.5% in 2011.

The growth in the value of bond trades was much higher compared to the growth in the number of bond trades, signifying greater institutional interest in fixed income products. The EMEA region witnessed the highest rise in the value of bond trading. Considering the modest growth in the number of bond trades in the region, this signifies a significant increase in the average transaction size. This may be the result of increased activity by pension funds and retirement funds that left the equity market and parked their funds in safer fixed income assets.

In the aftermath of the financial crisis, the capital markets industry has come under increased regulatory scrutiny. Regulations are evolving at a rapid pace and are expected to impact various business processes of financial intermediaries such as payment, stress testing, clearing and settlement, netting and collateral management, and trading. Also, the importance of HFT and dark pool trading is on the rise with HFT now accounting for a significant portion of trading on global exchanges.

These developments have led to the emergence of the following key trends for financial intermediary firms globally³:

- Exponential growth in data output intensity.
- Increased importance of Swap Execution Facilities (SEFs) in derivatives trading.
- Rise of global alliances.
- Continued focus on technology infrastructure upgrade.

Note that several trends covered in the 2011 *Trends in Global Capital Markets series* are still relevant and are not shown again. These include:

- Increased regulatory reforms impacting financial intermediary firms.
- High frequency and dark pool trading that drive trading volumes in financial intermediary firms.



Trends in the Global Capital Markets Industry 2011: Financial Intermediary Firms



Trends in the Global Capital Markets Industry 2011: Sell-Side Firms



Trends in the Global Capital Markets Industry 2011: Buy-Side Firms

³ Trends shown are not necessarily comprehensive, but have been highlighted due to their relevance and potential impact on the industry

4. Trend 1: Exponential Growth in Data Output Intensity



Intensifying competition, regulatory pressures, and increasing volatility are expected to drive the growth of data output intensity.

4.1. Background and Key Drivers

Data output intensity has been growing rapidly during the past few years. This has been especially true in the aftermath of the Lehman Brothers bankruptcy. Events such as the Flash Crash of 2010 have also contributed to this trend by making transparency, a robust audit trail, and enhanced reporting key regulatory priorities. With more granular regulations and enhanced market volatility becoming the new normal for financial markets, the rapid growth in data output intensity is expected to continue.

The key drivers for growth are:

- Factors such as declining growth in emerging markets, non-resolution of the European debt crisis, slow recovery in the U.S. economy, and political unrest in the Middle East have heightened volatility for financial markets worldwide.
- Pressure on exchanges and liquidity providers to remain competitive has driven them to squeeze market data into ever-tighter traffic bursts.
- Rapid strides in technology have enabled the provisioning of even more granular data at much faster speed.
- Demand for greater transparency from regulators worldwide has turned maintenance of complete and robust audit trails into a strategic priority for firms, resulting in even greater data output.

4.2. Analysis

Market volatility has been on the rise since the financial crisis erupted in 2008. In the U.S., 2011 emerged as a year of historic volatilities with there being 69 days in which 90% of the S&P 500 stocks moved in the same direction—more than the combined total from two other volatile years, 2008 and 2009⁴. Going forward, this trend is expected to continue due to a mix of macroeconomic and political factors. The increased market volatility is expected to result in the creation of ever-increasing market data⁵.

In order to achieve the best execution price for trades and to reduce execution costs, traders are increasingly looking for specialized feeds from exchanges.

These specialized feeds are fractionally faster than the Securities Information Processor (SIP) data (which the traders are required to access) as they avoid the physical hop to SIP processing centers. The specialized feeds also reduce the time taken for the SIPs to arrive at the best execution price and give the traders a holistic view of the likely execution cost of a given trade.

Exchanges, in their bid to meet this crucial customer demand (and thus attract the greatest liquidity), are increasingly upgrading their technology to provide more data and higher delivery speeds to their customers. For example, the BATS BZX exchange⁶ which provided 582 quotes and order book messages per millisecond in January 2011 has increased its message output by 60% within a year and is now sending 950 messages per millisecond. Even Nasdaq's UTP Trade Data Feed (UTDF), which is a SIP feed, has been growing at around 100% over the past year and is expected to reach 176,018 mps⁷ within a couple of years. Trade feeds from Securities Industry Automation Corporation's (SIAC) Consolidated Tape System (CTS) (another SIP feed that contains trades) is expected to reach 347,748 mps within a couple of years from its peak of 77,841 mps in September 2011⁸.

Regulatory changes are also expected to contribute heavily to the rapid growth in data output intensity. For example, quotes from NASDAQ and Consolidated Quotation System (CQS) increased at a CAGR of 137.0% and 196.8% respectively to reach 141,919 mps and 567, 242 mps in September 2011⁹. The recommendations of the SEC had a major role to play in this. It called for a massive overhaul of current order audit-trail system as part of an initiative called Consolidated Audit Trail (CATS). If these growth rates continue, then messages per second from NASDAQ and CQS are expected to reach 267,004 mps and 2,197,182 mps respectively in two years.

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4 <http://online.wsj.com>

5 Capital Markets Guide 2012, SAP, 2012, http://www.sybase.com/files/Thankyou_Pages/Capital_Markets_Guide_2012.pdf

6 BATS operates two stock exchanges in the U.S. namely the BZX Exchange and the BYX Exchange, which currently account for about 11-12% of daily equity trading in the U.S.

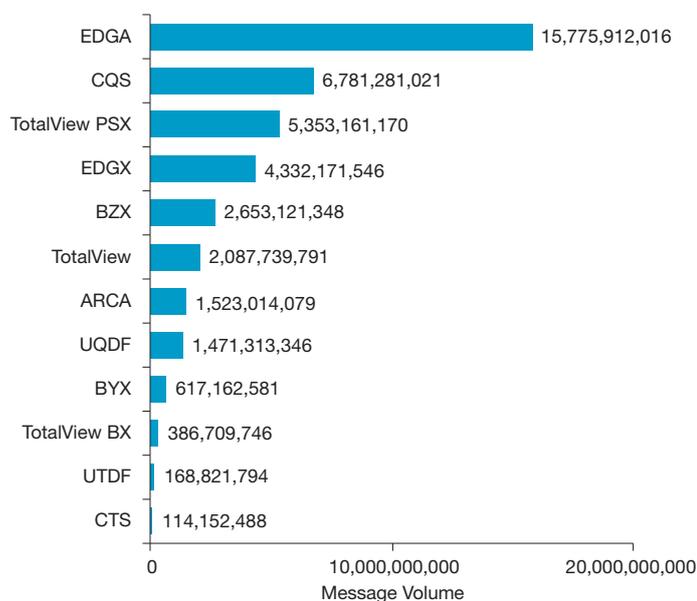
7 Messages per second

8 Capital Markets Guide 2012, SAP, 2012, http://www.sybase.com/files/Thankyou_Pages/Capital_Markets_Guide_2012.pdf

9 Ibid

Exhibit 4: U.S. Stock Market Daily Message Output, 2013E

Using 2011 message rates as a starting point, the message output by 2013 from the U.S. stock markets on any given day is expected to reach 41 trillion messages.



Source: Capgemini Analysis, 2012; Capital Markets Guide 2012, SAP, 2012

4.3. Implications

With technology acting as an enabler, liquidity providers and exchanges can be expected to continue increasing their data output intensity in the years to come. However, there is a high chance that going forward specialized feeds, greater data, and faster speeds will turn into standard practices instead of being the competitive differentiators that they are today. In other words, financial intermediaries will have to keep enhancing their technological capabilities to provide more data at faster speeds in order to retain their liquidity pools. This will in turn entail ongoing and continual technological investments directed towards boosting their data-disbursement and networking capabilities.

From a technological perspective, this explosion in data volumes is expected to create challenges for processors and memory resources. Investments need to be made in the expansion of data storage facilities and enhancement of data-handling and processing capabilities.

5. Trend 2: Increased Importance of Swap Execution Facilities (SEFs) in Derivatives Trading

Regulatory changes, primarily the Dodd-Frank Act, have led to an increased drive towards setting up SEFs.

5.1. Background and Key Drivers

The opaqueness and bilateral nature of the Over the Counter (OTC) derivatives market were blamed as the primary reasons for the financial crisis. The regulatory response in the post-crisis period has been to implement measures which enhance transparency and price discovery in the OTC markets. Towards this end, the Dodd-Frank Act mandated exchange trading and centralized clearing for the majority of swap contracts. It also directed the setting up of SEFs, which will be the location where centrally-cleared and standardized swaps get executed. Going forward, SEFs are going to be an integral component of the post-Dodd-Frank derivatives market and will play a critical role in the formation of the swap market of the future.

The key drivers are:

- Despite initial problems, the rules governing SEFs are expected to be fairly clear by the end of 2012, which will give a major boost to the SEF implementation plans of incumbents as well as new entrants.
- Demand for central clearing is on the rise. In February 2012, the CME Group cleared \$150 billion in combined OTC interest rate swaps and credit default swaps, which was 142% more than cleared in November 2011.
- The cost of technological implementation is declining as the technology to support messaging, quoting, connectivity, and execution is commoditized.

5.2. Analysis

Given the critical role that SEFs are expected to play in the derivatives market in the future, many platforms have announced plans for registration as SEFs.

A vast majority of these announcements have come from a high concentration of incumbent platforms which already support credit default swaps and interest rate swaps. Protection of market position appears to be the key motivation behind these announcements.

Incumbents who have announced plans for registration as SEFs also include modified trading platforms which are sponsored by interdealer brokers, designated commission merchants, and multi-dealer platforms.

Lured by the market potential that electronic trading swaps presents, many new entrants have announced their plans for registering as SEFs. However, most of these new entrants are those with a long association with the OTC derivatives market.

Exhibit 5: Potential Plans for Registration as SEFs¹⁰

A number of incumbent platforms plan to register as SEFs, and many potential challengers have been announced.

Announced SEF Sponsors	Platform Type	Swap Instrument	Announced Trading Protocols
Bloomberg FIT (ALLQ Derivatives)	MD2C	IRS, CDS, other OTC assets	RFQ, voice, hybrid
MarketAxess	MD2C	CDS	RFQ, RFM, CTT
ODEX	MD2C	IRS	RFI, RFQ, CLOB
Tradeweb	MD2C	IRS, CDS	RFQ, RFM, CTT
ICE CreditEx (Realtime)	D2D	CDS	CLOB, RFQ, CTT
FXAll	MD2C	FX derivatives	RFQ, CLOB
Thomson Reuters (Dealing, Matching)	MD2C	FX (Spot, Forwards, Deposits, FRAs, Outright Forwards, and NDFs)	RFQ
BGC Partners	D2D	All OTC asset classes	RFQ, CLOB, hybrid
GFI Group	D2D	All OTC asset classes	RFQ, CLOB, hybrid
ICAP	D2D	All OTC asset classes	RFQ, CLOB, hybrid
Tradition	D2D	All OTC asset classes	RFQ, CLOB, hybrid
Tullett Prebon	D2D	All OTC asset classes	RFQ, CLOB, hybrid
TeraExchange	D2D	CDS, IRS, Energy, NDFs, Equity	CLOB

Source: Celent: "Swap Execution Facilities", David Easthope, March 2012¹¹

¹⁰ D2D= dealer-to-dealer, MD2C= multi-dealer to client, IRS = interest rate swap, CDS = credit default swap, RFQ = request for quote, RFM= request for market, CTT= click to trade or continuous pricing, CLOB = central limit order book, EBOT= exempt board of trade, DCM = designated contract market, NI = no information, TBD = to be determined

¹¹ The data referenced in the table is updated till March 2012. It is thus possible that some of these plans may already have been put into operation at the time of this report

5.3. Implications

In order to operate efficiently as a SEF, platforms will need to establish efficient connectivity with clearinghouses as well as swap participants and will also have to achieve integration with swap data repositories. Intermediaries will also need to ensure that their trading protocols are SEF-compatible. However these constitute only basic requirements for operating as a SEF and do not guarantee capturing of order flow. Potential SEFs should look at ways to differentiate themselves from the competition, such as ensuring clearing-certainty, providing low latency execution, and providing improved visual experience for the users.

According to Celent¹², SEF implementation is expected to be a technology-heavy exercise with nearly 80% of the expenditure expected to be on IT. Nearly three-fourths of the technology spending is expected to be on IT integration with technology interface, clearing, reporting, and middle-ware being the primary focus areas:

- Technology interface efforts are expected to be directed towards the development of rule engines, establishment of connectivity with users, creation of an easy to use a graphic user interface (GUI), and integration with order management systems (OMS).
- In clearing, testing of connectivity with clearinghouses, ensuring certainty of clearing, and reducing latency are expected to be key focus areas.
- In reporting, efforts are expected to be directed at establishing connectivity with swap data repositories and developing real-time messaging capability.
- Message standardization and establishing interoperability with middle-ware are expected to be the core priorities.

IT innovation, with a focus on improving price discovery, is expected to account for the remaining one-fourth of the technology spending in SEF implementation. Non-IT expenses are expected to account for 20% of the cost of SEF implementation and will occur primarily in areas such as registration, surveillance, monitoring of rules and regulations, investigation, and legal and advisory fees¹³.

12 Celent: "Swap Execution Facilities", David Easthope, March 2012

13 Ibid

6. Trend 3: The Rise of Global Alliances

Global alliances are expected to result in reduced IT support, economization of IT functions, and creation of economies of scale, which are in turn expected to drive increased cost synergies for financial intermediaries.

6.1. Background and Key Drivers

Competition in the financial intermediaries market has intensified over the past few years due to the proliferation of trading venues and the rise of dark pools and multi-asset trading facilities. The nature of customer needs too has undergone significant changes with more and more traders now demanding access to multiple geographies. The rise of financial markets in Asia and Latin America has resulted in exchanges and central counterparties (CCPs) from the developed markets scouting for ways to gain a foothold in emerging markets.

All of these factors are leading exchanges and trading venues to explore cross-border opportunities in the forms of mergers, acquisitions, and alliances.

Key drivers include:

- Global alliances are expected to result in a reduced need for IT support, economization of IT functions, and the creation of economies of scale, which are in turn expected to drive increased cost synergies for financial intermediaries.
- Global alliances reduce market friction arising from heterogeneity of platforms and present greater opportunity for platform standardization. They also make access to multiple geographies easier for trading participants.
- Financial intermediaries expect to benefit from increased scale, technological collaborations, and increased market access that global alliances afford.

6.2. Analysis

Financial intermediaries have traditionally relied on cross-border mergers and acquisitions (M&As) to increase their global reach. To take a few examples, NYSE and ArcaEx merged in 2006 to increase their access to superior matching engines. In 2007, considerations such as increased global presence and benefits accruing from a common technology platform led to the merger of NYSE and Euronext. In the same year, LSE and Borsa Italia merged to increase their scale of operations, enhance their range of products, and to facilitate easy migration of their technology platform. In 2008, NASDAQ and OMX merged to achieve greater revenue diversification, global growth, and higher technology savings.

Despite their popularity with the financial intermediaries, the fate of cross-border M&As has become increasingly clouded in recent years due to a host of regulatory and political objections. For example, in April 2011, the highly anticipated ASX/SGX deal failed when Australia officially blocked SGX's proposed takeover of ASX on the grounds that it threatened the country's control of its clearing and settlement systems. In May 2011, the NASDAQ/ICE/NYSE deal failed due to opposition from U.S. antitrust regulators. In June 2011, the TMX/LSE deal failed as they could not win shareholder support. Most recently, in February 2012, the much-touted NYSE Euronext/ Deutsche Bourse merger failed when the European Commission blocked it.

Political and regulatory obstacles have made mergers more difficult, leading to innovative global alliances.

These recent failures have resulted in the exploration of innovative methods, which allow them to exploit potential synergy opportunities while circumventing the hurdles that regulations and political opposition pose. For example, in December 2011, Korea Stock Exchange and Tokyo Stock Exchange entered into an agreement under which they will work together on technology cost management, data management, and listings. In order to promote greater capital circulation between their markets they have also agreed to make the prices of stocks listed on both exchanges mutually available on their websites.

In June 2012, the stock exchanges of Singapore, Malaysia, Philippines, Vietnam, and Indonesia established the ASEAN Trading Link, which they hope will be a catalyst for further fund inflows into Southeast Asia. Through this link they also hope to increase the region's attractiveness as a capital market bloc. BRIC's and South African exchanges too have established an alliance to list each others' stock index futures and index options contracts in local currencies.

Finally, Chile's Bolsa de Comercio de Santiago, Colombia's Bolsa de Valores de Colombia (BVC), and Peru's Bolsa de Valores de Lima (BVL) have established the Mercado Integrado Latinoamericano (MILA) which will allow brokers to route orders to these exchanges via a FIX connection maintained by all of the exchanges.

6.3. Implications

Going forward, the importance of cross-border alliances between financial intermediaries is expected to grow even further due to the growing importance of multi-geography and multi-asset trading. Given the regulatory and political obstacles that cross-border mergers and acquisitions might face, exchanges can be expected to increasingly leverage innovative alliances such as the establishment of network linkages and partnerships in research and development and data sharing. Consolidation in the market will continue, however, it can be expected that M&As will be resorted to only after exhausting all means which might not involve either regulatory or political opposition.

From a business perspective, these global alliances are expected to have a significant impact on the bottom lines of financial intermediaries. Cross-marketing efforts are expected to reduce marketing costs, and revenue sharing agreements (which the intermediaries may enter into for joint network and infrastructure) are expected to have a positive impact on revenue stream.

Establishing cross-border alliances is expected to be a technology-intensive exercise. Firms will have to assess their networking and data-management capabilities, and may have to bring about changes/upgrades in order to meet the requirements that their cross-border alliances might impose. Standardization of IT platforms of exchanges entering into a partnership/alliance may have to be carried out, which will require additional investments from an IT perspective.

7. Trend 4: Continued Focus on Technology Infrastructure Upgrades

7.1. Background and Key Drivers

The role that technology plays for financial intermediaries is undergoing a rapid change. From being an enabler a few years back, technology has transformed itself into being a core component. Rapid advances are being made in the areas such as trading platforms, surveillance systems, and matching engines, with the focus being on enhancing the speed, scale, and efficiency of operations.

Changes in customer preferences; the rise of alternative trading strategies such as HFT, and changes to the market infrastructure induced by new regulations are expected to be the major factors which will drive the technological infrastructure investment made by financial intermediaries in the near future.

Key drivers include:

- Rise of HFT and the need for related high-speed order entry and execution is expected to expand the range of advanced technology services that financial intermediaries need to provide.
- Customer demands for multi-asset and multi-geography trading are expected to drive financial intermediaries towards expanding their product range and geographical reach.
- Enhanced regulatory focus on risk management is expected to drive technological investments directed at the creation of centralized and more robust risk management systems.
- Exchanges and CCPs need to enhance their data management, networking, risk management, and reporting capabilities in order to facilitate the exchange trading and central clearing of standardized swap entrustments.

7.2. Analysis

The importance of HFT has increased tremendously over the past few years and it now accounts for a major share of trading in developed markets¹⁴. HFT's rise has brought forth a host of technological needs, including:

- The availability of advanced connectivity networks which provide a single point of contact with multiple markets and counterparties
- Co-location services, which reduce the latency in order matching, order execution, and dissemination of data feeds
- Access to multiple liquidity sources
- Speedier market surveillance

Exchanges around the globe are taking steps to build their technological capabilities for meeting these needs. For example, NYSE Technologies' Secure Financial Transaction Infrastructure (SFTI) has been launched in the U.S., Europe, and Asia, which aims to reduce the risks associated with gaps in market data during trading hours and boasts of an infrastructure capable of powering every Euronext market around the globe. Several exchanges such as CME, NYSE, and NASDAQ OMX

Firms are investing in technology infrastructure for regulatory compliance and to gain a competitive edge.

¹⁴ For additional reading, please refer to "High Frequency Trading: Evolution and the Future" by Capgemini at <http://www.capgemini.com/insights-and-resources/by-publication/high-frequency-trading-evolution-and-the-future/>

are also providing co-location facilities to their trading members. The need for trading firms to access to multiple liquidity sources has resulted in liquidity centers (ecosystems where firms can gain access to a host of technology services). Global exchanges such as the NYSE and the CME Group are rapidly increasing the number of their liquidity hubs.

Increased preponderance of electronic trading and the evolution of sophisticated algorithms have driven the need for multi-asset trading. The desire to access the high growth markets of Latin America and Asia-Pacific has turned multi-geography trading into an important need for trading participants. Meeting these customer needs will require IT systems that can manage cross-market risks and carry out effective cross-market surveillance.

As a consequence of the migration of standardized OTC derivatives to exchange platforms, real-time reporting of swap price and volume data has emerged as a priority for financial intermediaries. Consequently they are making increased technological investments aimed at boosting their reporting capabilities. Technological investments are also being made to address the need for updating collateral addition/removal functionalities and to enhance the capacity of trading platforms. Finally, trading platforms are being updated to include IT functionalities for facilitating market maker risk protection, position monitoring, and request for quote.

7.3. Implications

Investment in technology is expected to remain a key priority area for financial intermediaries in the coming years. The core areas towards which future technological investments will be directed include:

- Boosting reporting capabilities
- Enhancing risk management
- Improving data management
- Improving handling of market data feeds
- Establishing and maintaining market networks
- Enhancing capacity
- Reducing latency in order execution and data dissemination



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