Centralized Trading

Benefits, Best Practices,
and a Path to Implementation

BCi

Abstract

What is centralized trading? Does it make sense for your institution? Are you ready to undertake this journey? What will it cost? What are the benefits?

This white paper explores the benefits and drawbacks of centralized trading. We offer decision criteria for asset management firms who are considering or on their way to centralized dealings, to assess their unique circumstances, costs, and other constraints before implementing a centralized framework. We develop best practices to implement centralized dealings, including good governance, regulatory requirements, defining order types and cross-asset best execution, working from home and technology prerequisites.

The analysis draws on the existing body of research for trading desk structures, industry trends and best practices, scenario analysis to estimate the benefits net of costs, and case studies from global asset management firms.

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Executive Summary

The world of trading and the role a trader plays within a firm has transformed over the past decade. A shifting regulatory landscape following the 2008 financial crisis, rapid advancements in technology and increasingly complex global financial markets have all impacted trading. To meet rising demands, many organizations are implementing a centralized trading framework in which a single group of traders handle all trades, across all asset classes throughout the firm, from one hub. This paper explores the growing need for centralized dealings in the asset management industry, considers the key benefits and drawbacks of implementing a centralized execution desk, and recommends best practices for firms to use in implementation.

The findings are informed by BCI's journey in developing its own centralized trading function. The development of the function took place as BCI was rapidly internalizing assets and implementing more sophisticated strategies across asset classes – offering a blank slate from which to build. From the onset, it was clear that a centralized trading structure including strong governance controls and a unified cross-asset approach were necessary. Today, BCI's derivatives, trading and indexing team has a cross-asset mindset supported by a strong focus on continuous education to advance each member's theoretical and practical understanding of cross-asset derivatives and trading in global markets.

WHAT ARE THE BENEFITS OF CENTRALIZED TRADING?

A centralized desk allows a firm to leverage benefits from ***one voice and one wallet***. *One voice* represents a unified approach to negotiations, driven by a common understanding of how and where a firm does business with its partners across the organization. *One wallet* represents the line of sight and common principles for all transactions and commission costs and supports firms in using data to ensure *fair service for fair payment*.

Best practices in good governance are also supported by centralized trading. Firms can mitigate operational, reputational, and legal risks by staying at the forefront of developments in governance and focusing on key stakeholders. Further, centralized dealings present an opportunity to integrate environmental, social and governance factors at all stages of the investment process.

Perhaps one of the most powerful benefits is the potential to transform the role of the trader and support a performance-based team environment. Centralized trading moves the role of the trader from an operational focus to an advisory role – opening opportunity for traders to add significant value in the investment process. A centralized desk also functions as a meeting place to discuss cross-asset data, and to uncover high-impact insights and new investment and trading ideas.

KEY RESEARCH FINDINGS ON THE BENEFITS OF CENTRALIZED TRADING

- ✓ ***Enables the firm to speak with one voice in negotiating the best possible result for clients with respect to commissions, deal flow and service levels.***
- ✓ ***Enables trading from one cross-asset desk with management oversight, controls and compliance.***

- ✓ ***Mitigates legal, operational, and reputational risks - and offers a unique opportunity to influence Environmental Social and Governance (ESG) practices with broker partners.***
- ✓ ***Facilitates streamlined processes, efficiencies, and scalability for growth.***
- ✓ ***Allows the primary focus of the trading role to move from operational to advisory and opens opportunity for the trader to add significant value in the investment process.***
- ✓ ***Promotes a performance-focused team environment with collaboration among asset classes.***
- ✓ ***End-to-end control of physical and synthetic assets to optimize collateral, securities lending and financing, and counterparty risk management***

WHAT ARE FACTORS AND TRENDS IMPACTING TRADING?

Changes in regulation around the world have heightened the scrutiny of trading operations and resulted in the need for stronger governance practices to protect financial markets and investors. As markets and regulations evolve rapidly and asset managers adapt and grow, client needs, and expectations are rising in tandem. A review of legislation related to centralized trading in major developed markets, including the commonalities and differences across jurisdictions, surfaces a common thread of best practices. These include:

- the fiduciary obligation to put client interests first;
- the need for a firm-wide, cross-asset best execution approach;
- full segregation of duties and centralized controls in a single order management system (OMS); and
- centralized oversight of costs.

In addition to new regulation, changes in market structure are also largely driven by advances in technology and the availability of data, which has led to an increasingly automated electronic ecosystem. The development of electronic market structures in public markets, futures and options have changed the way people trade. Leading technology facilitates cross-asset best execution and related processes. Based on the research and analysis, there is value for firms in segmenting orders based on the needs of the trade, into “low-touch”, “mid-touch” and “high-touch” categories. By segmenting orders this way, firms can apply cross-asset best practices and insights to their executions, and in some cases, codify best execution rules through automation. Technology also enables the one wallet approach, as centralized management of trading and commission data increases the potential to better negotiate pricing, trade terms and fees for clients.

Additionally, the growing use of multi-asset strategies is often a precursor to centralized dealings, along with an increase of in-house asset management. Firms with a variety of order types, complex strategies, and advanced data needs, will benefit most from the new insights and opportunities that centralized dealings brings, in addition to fee savings.

Influenced by these trends, desk structures across the industry are evolving, and traders are required to do more with less, including executing higher volumes and more complex trades. While the sell side has taken the lead in the evolution with efforts to downsize and centralize dealings, the buy side is following suit. Analysis of case studies show clear benefits from implementing centralized dealings for virtually all

global asset management firms and for firms that engage predominantly in passive cross-asset strategies or highly active cross-asset strategies.

Finally, the onset of Covid-19 and circuit breaker lockdowns demanded that firms move entire trading operations to employees' kitchen tables or home offices. Complicating the matter even further, the shift happened in a matter of weeks. Over a year on from this event and with work from home still in place in many organizations, it has been become apparent that the benefits of centralized trading do not require one physical location. However, asset management firms must tailor their approach to address the risks of working from home to ensure the effectiveness of surveillance is not diminished.

WHAT ARE THE BARRIERS TO IMPLEMENTATION?

While the case for adoption of centralized trading is evident there are barriers to implemenation that firms should be aware of.

Considering the costs of implementation, the potential benefits of centralized trading are different for each firm. Modeling suggests that most firms with a minimum of six to nine product types including high-touch orders like derivative, asset allocation or transition management trades, would benefit from implementing centralized dealings after accounting for the costs of implementing a leading OMS. However, small firms with only low-touch orders or a mix of low- and mid-touch orders may not see a net benefit. The benefits of managing a centralized trading desk internally need to outweigh the costs.

Within fixed income trading, there are specific impediments to implementation as the market has been a laggard in electronification due to unique market structure challenges. Trading firms have adapted and innovated amid regulatory pressures and are now technologically ready to reap the benefits of centralized trading which extend to fixed income. Despite the advancements, a cultural shift may be needed in order to implement this final frontier.

The evolving world of work from home and necessity for a tailored approach also increase the complexity of implementation. Firms must consider the impacts on governance structures, culture and risk mitigation.

SUMMARY

As asset managers strive to adapt to regulatory and technological changes in global financial markets and to always serve clients' best interests, it is an opportune time to review the benefits provided by centralized trading. A centralized trading framework helps reduce legal, reputational, and operational risks; and supports the efficient flow of trading, market and client portfolio information. Further, it promotes a performance-focused team environment and a culture of strong ethical and governance practices. While the evidence points to the many benefits of centralized trading, it also demonstrates that not all organizations will benefit equally from the implementation. Organizations will need to consider the unique cost-benefit outcomes based on their own size, structure, and technology foundation.

INTRODUCTION

In this white paper, we investigate the growing need for centralized dealings in the asset management industry. **Centralized dealings and centralized trading** refer to a business framework in which a single group of traders handle all trades, across all asset classes throughout the firm, from one hub. We consider the key benefits and drawbacks of implementing a centralized execution desk and recommend a detailed course of action for its implementation. The scope of the review requires a thorough analysis of industry trends and leading practices, a firm's unique client and investment needs, as well as timing, technology requirements, and other operational implementation considerations.

REGULATORY REQUIREMENTS 

Regulators globally[1] have long provided guidance to asset management firms with respect to trading, oversight and controls. Regulations were originally developed during a period in which firms managed each asset class independently, trading was decentralized, and portfolio managers had the authority to initiate, execute, and book their own orders. Regulators' focus was on public equities, as the most transparent asset class with readily available and reliable data. They developed important rules around best execution of client orders, and **soft dollar** arrangements (bundled research and execution payments). U.S. and Canadian regulators have not materially updated these rules since this time. However, the **European Securities Market Authority** (ESMA) in the European Union and the **Financial Conduct Authority** (FCA) in the United Kingdom are now addressing all asset classes with respect to best execution. Revisions include quantifying research, execution and other payments, and full segregation of duties including order generation and trade execution in the front office. In our view, the ESMA and FCA have meaningfully improved on historical legislation, putting client interests first.

Despite the uneven speed of regulatory reform, we find similarities in intent among jurisdictions. We also recognize that although the ESMA with the **Markets in Financial Instruments Directive II** (MiFID II), is at the forefront in taking a holistic approach to regulating all asset classes, the implementation and application of the regulations are not prescriptive in some cases, especially for non-equity assets[2].

To determine the best course of conduct for centralized dealing structures, we first review the commonalities in the over-arching principles of global regulations, and then offer best practices that seek to address the rapidly evolving trading environment facing asset managers. We intend for our definitions of best practices to be complementary, and in no way conflict with legislative requirements.

The four widely held regulatory principles that we address are: (1) client interests first, (2) best execution, (3) segregation of duties and centralized controls, and (4) centralized oversight of costs and transparency to asset owners.

[1] Jurisdiction under the scope of review in this paper include the United States, European Union, United Kingdom and Canada.

[2] European Securities and Markets Authority (ESMA) Review Panel. (2015). *Best Execution under MiFID. Peer Review Report.*

1. CLIENT INTERESTS FIRST

Putting client interests first is an underlying principle within all areas of legislation affecting trading. It is both a fiduciary responsibility and legal obligation. Holding client best interests top of mind can aid in the decision-making process when there is ambiguity in legislation.

2. BEST EXECUTION

The concept of "best execution" in the investment industry has been the focal point of significant debate and scrutiny in recent years. A perceived lack of prudence in managing client commissions is a primary reason for the regulatory shift in Europe under MiFID II, and is why best execution has been a cornerstone of the regulation within MiFID and MiFID II.

In reviewing the legislation to better understand the concerns, we find that definitions for best execution are typically broad in scope and are applicable within a multi-asset framework. However, regulators have historically focused on providing specific additional guidance on public equities, likely due to more readily available market data. Unfortunately, this has led many asset managers to continue to focus disproportionately on this asset class.

In Canada, the Investment Industry Regulatory Organization of Canada (IIROC) governs the activities of investment firms and defines best execution as,

> *"Obtaining the most advantageous execution terms reasonably available under the circumstances."* [3]

In the U.S., the Financial Industry Regulatory Authority (FINRA), who supervises broker-dealers, has codified the broker-dealer duty of best execution in Rule 5310. This rule provides that;

> *"[I]n any transaction for or with a customer or a customer of another broker-dealer, a member and persons associated with a member shall use reasonable diligence to ascertain the best market for the subject security and buy or sell in that market so that the resultant price to the customer is as favorable as possible under prevailing market conditions."* [4]

According to the U.S. Securities and Exchange Commission (SEC or "the Commission"), who supervises registered investment advisers, in making its best execution determination,

> *"A money manager should consider the full range and quality of a Broker's services in placing brokerage including, among other things, the value of research provided as well as execution capability, commission rate, financial responsibility, and responsiveness to the money manager."* [5]

MiFID II Article 27, defines best execution as the requirement

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[3] IIROC Rules (2021). https://www.iiroc.ca/sites/default/files/2021-10/Attachment_3_Updated_version_of_the_IIROC_Rules_en.pdf

[4] Financial Industry Regulatory Authority (FINRA), Rule 5310. **https://www.finra.org/rules-guidance/rulebooks/finra-rules/5310**

[5] Securities and Exchange Commission (SEC). (2006). Interpretive Release Concerning the Scope of Section 28(e) of the Securities Exchange Act of 1934 and Related Matters. [Release No. 34- 23170] **https://www.sec.gov/rules/interp/34-23170.pdf**

"that investment firms take all sufficient steps to obtain, when executing orders, the best possible result for their clients taking into account price, costs, speed, likelihood of execution and settlement, size, nature or any other consideration relevant to the execution of the order." [6]

As alluded to in Article 27 of MiFID II, determining the quality of trade executions entails the evaluation of subjective, objective, and complex qualitative and quantitative factors. Further complicating this assessment is the fact that these factors change over time with changes in cross-asset trading strategies, technology and market structure.

Nevertheless, increasing complexity does not absolve an asset manager of its requirement to **take all sufficient steps to obtain the best possible result for clients.** This means trade-offs beyond price to include factors like speed of execution, order size, market impact, the nature of the trade (e.g., brokered trade vs. electronic order) and cross-asset market conditions.

The CFA Institute in its Asset Manager Code[7], provides further guidance for asset management firms, to drive a higher standard of ethical behaviour and the protection of investors' interests than required by legislation. The important clarification that the CFA Institute makes for asset managers is the need to evaluate best execution from the portfolio level, not within the context of a single asset class**.** This has been a long-standing policy of the CFA Institute, as demonstrated in the 2004 Trade Management Guidelines below.

THE CFA INSTITUTE GUIDELINES ON BEST EXECUTION

"The trading process firms apply that seeks to maximize the value of a client's portfolio within the client's stated investment objectives and constraints. This definition recognizes that best execution

- *is intrinsically tied to portfolio-decision value and cannot be evaluated independently,*
- *is a prospective, statistical, and qualitative concept that cannot be known with certainty ex ante,*
- *has aspects that may be measured and analyzed over time on an ex-post basis, even though such measurement on a trade-by-trade basis may not be meaningful in isolation, and*
- *is interwoven into complicated, repetitive, and continuing practices and relationships."*

[6] See Article 27 (1) of Level 1. (2014**). https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:02014L0065-20220101&from=EN#tocId35**

[7] CFA Institute. (2020) *Asset Manager Code.* https://www.cfainstitute.org/-/media/documents/code/amc/asset-manager-code.pdf

Considering concepts and definitions for best execution across jurisdictions, we view the implementation of a centrally managed approach that supports best execution across assets as a key success criterion for a centralized trading desk. Firms face a growing challenge to meet and demonstrate best execution for clients. A centrally managed approach to best execution, allows asset managers, to consider all aspects of the trade, in determining the best value and best result for clients. Centralized trading aids in assessing the qualitative cross-asset dynamics of markets, controlling information leaks, and maximizing value for clients at a total portfolio level. In combination, this results in better oversight and protection of client interests.

3. SEGREGATION OF DUTIES AND CENTRALIZED CONTROLS

Segregation of duties is an essential best-in-class practice to protect investors. Giving a single individual or team complete control over a process can expose the firm to risk. In the context of trading, this refers to assigning different teams in an asset management firm the responsibilities of initiating, executing, booking, and accounting for transactions. Within the front office, a single individual should not be able to initiate an order and bind the firm by executing the trade. The custodian is responsible for booking the trades, which includes settling transactions, making payments, and maintaining custody of the assets. A firm's accounting department reconciles its books of records against the custodian's trade and holdings information.

Separation of these specific job responsibilities is an essential internal control, intended to protect investors from the risk of financial loss due to fraud or error. Furthermore, we believe the spirit of the regulation, which is captured in guidance from the Financial Conduct Authority ("FCA") (profiled below), aligns with our recommendations for full segregation of duties. Asset management firms who do not follow this framework risk significant reputational damage and misalignment with regulatory best practices.

THE FINANCIAL CONDUCT AUTHORITY (FCA) ON SEGREGATION OF DUTIES

The FCA in the U.K. notes in regulation SYSC 14.1.31 that,

"A firm should normally ensure that no single individual has unrestricted authority to do all of the following:

(1) initiate a transaction;
(2) bind the firm;
(3) make payments; and
(4) account for it."

The FCA further notes in SYSC 14.1.32 that,

"Where a firm is unable to ensure the complete segregation of duties (for example, because it has a limited number of staff), it should ensure that there are adequate compensating controls in place (for example, frequent review of an area by relevant senior managers)."

It is important to note that the FCA's requirement within SYSC 14.1.31 to segregate responsibilities, applies to all asset classes. The FCA only grants an exception to firms that are "unable to ensure the complete segregation of duties." [8] While the segregation of duties may reside within each asset class in decentralized format, guidance from the FCA suggests a preference for centralized controls and oversight. This is evident in the FCA's Final Notice[9] and action taken against Threadneedle Asset Management Ltd (Threadneedle), as outlined in the case study below.

In December 2015, the FCA fined Threadneedle over £6 million for failing to put sufficient controls in place in the front office operations of its fixed income department. An investigation was launched after a portfolio manager initiated, executed, and booked a $150 million trade to purchase Argentine warrants at four times their market value. Fortunately, Threadneedle's back office identified the problem and did not settle the trade[10].The portfolio manager was not authorized to make the trade, and the High Court later found that there was intended fraud upon Threadneedle, which could have exposed their funds to a £70 million loss, had the trade settled.

Because of this incident, the FCA conducted a full review of the processes and controls in place for trading at Threadneedle. The FCA found that the controls in place at Threadneedle were

[8] Financial Conduct Authority (FCA). (2006). **https://www.handbook.fca.org.uk/handbook/SYSC/14/1.html?date=2011-11-01**

[9] Financial Conduct Authority (FCA). (2015). **https://www.fca.org.uk/publication/final-notices/threadneedle-asset-management.pdf**

[10] Financial Conduct Authority (FCA). (2015). https://www.fca.org.uk/news/press-releases/fca-fines-threadneedle-asset-management-limited-%C2%A36m

inadequate, as they did not segregate the trading duties on the emerging markets and high yield desks.

In its review, the FCA defined the segregation of trading duties as follows:

> *"A fund manager (sitting on an investment desk) initiates an order to buy or sell a security or other instrument and the dealer (sitting on the Central Dealing Desk) executes and books the order. On execution, the order becomes a "trade" (an agreement between the buyer and seller to purchase a defined number of units in the security on a certain date) which a back office "settles" by instructing the custodian to exchange money for the security. This separation of trading duties operates as a preventive control because the central dealer acts as a check on the fund manager."* [11]

In addition, the FCA noted that Threadneedle's "*preventive controls were inadequate because they failed to:*

- *Restrict fund managers' ability to initiate, execute and book trades on funds other than their own without obtaining express recorded consent;*
- *properly calibrate pre-trade soft alerts on trades;*
- *enforce a requirement for fund managers to provide a rationale for overriding a soft alert; and*
- *code appropriate hard stops in its trading system which could prevent unauthorised trades in excess of those limits from proceeding to settlement."*[12]

They also found other controls were inadequate. Specifically, **the FCA found that there was an over-reliance on post-trade monitoring, exacerbated by the number of delayed trade bookings**. These factors increased the risk of loss due to the firm being committed to a trade that they could have detected as an error.

The FCA also noted insufficient controls related to ensuring best execution and fair market prices through pre-trade price discovery. Portfolio managers did not consistently obtain and document a broad enough range of broker prices (via competing broker quotes in the case of **over-the-counter** (OTC) trades).

The serious issues highlighted in this case reinforce the necessity for centralized dealings. Given that non-compliance with best practices exposes both the asset management firm and client to erroneous and fraudulent transactions ~~–~~ we view segregation of duties among each of the four areas highlighted with the FCA's SYSC 14.1.31 regulation as a key success criterion in centralized dealings. To meet best practices firms should segregate the following duties: (1) initiate transaction, (2) bind the firm, (3) make payments, and (4) account for transaction. Best practices require that individuals with specialized job functions perform each of these duties. Moreover, firms should centralize the highest risk function, binding the firm, for maximum oversight and control. Duplication of the controls needed in the front office in a decentralized format introduces unnecessary risks, training for staff, and cost for clients.

[11] Financial Conduct Authority (FCA). (2015). **https://www.fca.org.uk/publication/final-notices/threadneedle-asset-management.pdf**

[12] Ibid. pg. 18

4. CENTRALIZED OVERSIGHT OF COSTS AND TRANSPARENCY TO ASSET OWNERS

Funds used to pay for the execution of trades and research are the property of the client, and therefore, require a high standard of care in their oversight and allocation. The use of soft dollar arrangements, also referred to as bundled research and execution payments, has long been a controversial part of legislation. The controversy lies in the inherent conflict of interest when an asset manager selects an execution venue because of the research services that they provide rather than because of their execution capabilities.

The bundling of fees can create the following risks for clients::

- trading more often than necessary;
- over-consumption of services like investment research and data, resulting in higher costs;
- potential conflicts of interest arising from personal relationships informing the choice of trading partner; and
- impeding the use of other trading partners with more favourable execution.

In the United States (U.S.), the SEC has explicitly carved out a safe harbour, which authorizes bundled commissions within Section 28(e) of the Exchange Act, provided all the conditions in the section are met.[13] However, they have also acknowledged through their interpretive release in 2006[14] that a conflict of interest exists regarding bundled fees:

- *"[u]se of client commissions to pay for research and brokerage services presents money managers with significant conflicts of interest, and may give incentives for managers to disregard their best execution obligations when directing orders to obtain client commission services as well as to trade client securities inappropriately in order to earn credits for client commission services."* [15]

The SEC is facing pressure to reform Section 28(e), both inside and outside the Commission. [16] The legislative pressure is particularly intense from global asset management firms, as they find it challenging to deal with both European and U.S. legislation. Given the requirements for U.S. firms with operations in Europe to comply with MiFID II and FCA legislation, the SEC issued a series of "no action" letters (last renewed on Nov. 4, 2019) effectively giving firms permission to receive hard dollar commission payments from clients. [17]

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[13] Section 28(e) of the Securities Exchange Act of 1934, as amended. **https://www.law.cornell.edu/uscode/text/15/78bb**

[14] Securities and Exchange Commission (SEC). *Commission Guidance Regarding Client Commission Practices Under Section 28(e) of the Securities Exchange Act of 1934, SEC, Exch. Act Rel. No. 54165, at 3*. (2006). **https://www.sec.gov/rules/interp/2006/34-54165.pdf**

[15] Ibid. p.g. 3

[16] Commissioner Kara M. Stein, Statement on the Staff's No-Action Relief Regarding MiFID II (Oct. 26, 2017), **https://www.sec.gov/news/public-statement/statement-stein-2017-10-26**; *see* SEC, Comments on Measures to Facilitate Cross-Border Implementation of the European Union's MiFID II's Research. **https://www.sec.gov/comments/mifidii/mifidii.htm**

[17] Securities Industry and Financial Markets Association, SEC Staff No-Action Letter (Nov. 4, 2019), **https://www.sec.gov/investment/sifma-110419**; Securities Industry and Financial Markets Association, SEC Staff No-Action Letter (Oct. 26, 2017), **https://www.sec.gov/divisions/investment/noaction/2017/sifma-102617-202a.htm**

Under MiFID II, brokers are required to "unbundle" their transaction fees. This means charging separately for execution and other benefits like research, software, and data. The key principle behind this is the best interests of clients. Because of MiFID II, asset management firms globally have improved their accountability and scrutiny of both research and execution costs. Studies suggest there have been significant cost savings in research payments since the implementation of MiFID II.[18]

> ***Since the introduction of MiFID II reforms, budgets set by firms to spend on research have fallen on average by 20%-30%.***
>
> ***Despite these budget reductions, most asset managers say they are still getting the research they need.[13]***
>
> ~ FCA's review in September 2019

The first step in improving cost discipline and driving research payments lower is to ensure the proper tools are in place to enable fairness. This requires firms to invest in their data management by implementing formal, centralized oversight of commissions, and understanding and quantifying research needs and budgets. Pricing power is possible because of greater cost transparency, informing one centralized voice for negotiation, and contributing to more competition for research. Asset managers no longer overpay as much and as often for research. Instead, firms are moving to a fair payment for fair services model. The buy side is more discerning, utilizing sell-side services less and sourcing research in-house more often.

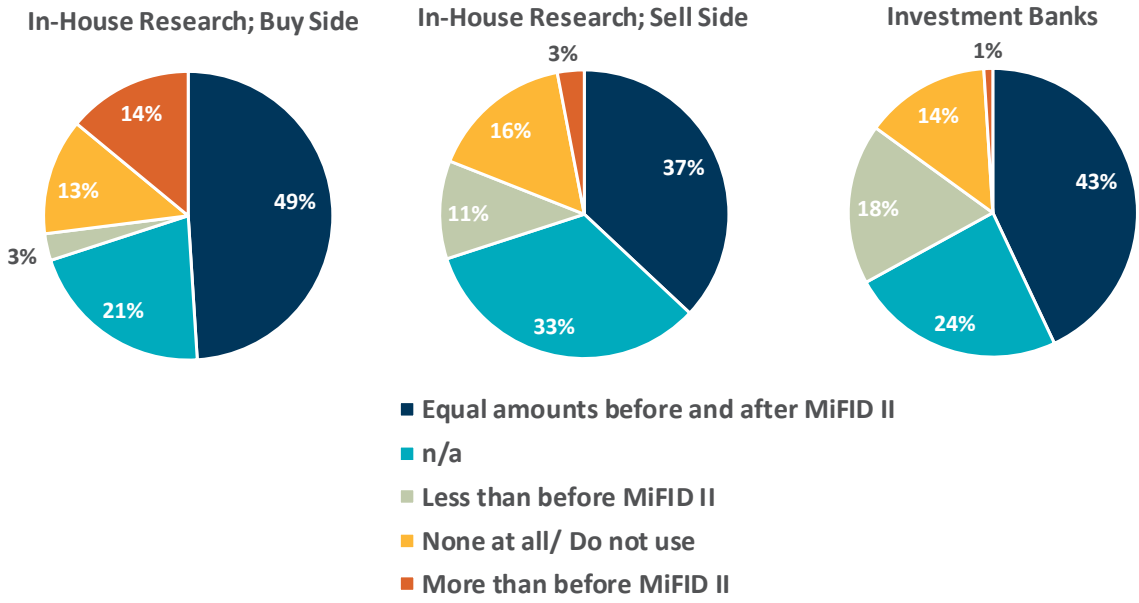
While fostering trading partnerships is vital, firms must establish boundaries and ensure checks and balances are in place. For example, an internal benchmark should flag if a disproportionate amount of commission is paid to one trading partner, if it's otherwise unwarranted because of flow or preferred pricing.

According to the CFA Institute *2019 US Research Survey,*[19] asset managers residing in the U.S. have been increasingly turning to in-house and independent research sources following the implementation of MiFID II. For example, when asked, *"For each of the following research providers, how much research do you source compared to before MiFID II?"* 14 per cent of buy-side respondents said that they were getting more research in-house, 11 per cent said that they were getting less from the sell side, and 18 per cent said that they were getting less from investment banks.

[18] Financial Conduct Authority (FCA). (2019). **https://www.fca.org.uk/publications/multi-firm-reviews/implementing-mifid-ii-multi-firm-review-research-unbundling-reforms**

[19] Allen, J. CFA Institute. *CFA Institute 2019 US Payment for Research and MiFID II Survey.* **https://www.cfainstitute.org/-/media/documents/survey/us-payment-research-mifid-ii-2019-survey.ashx**

HOW MUCH RESEARCH DO YOU SOURCE COMPARED TO BEFORE MIFID II?



World-class asset management firms are accountable to investors for their oversight and prudence in allocating commission dollars. Given the inherent conflict of interest, which can compromise best execution, firms should avoid bundled commissions to the extent possible by market convention and jurisdiction. MiFID II requires that firms with operations in the European Union pay for research directly out of their P&L or via research-payment accounts. For firms outside of the scope of MiFID II, **we recommend unbundling commission payments via Commission Sharing Agreements (CSAs), managed through a centralized trading desk**. CSAs allow asset managers to separate the trade execution fee from the research payment account. This division and transparency allow asset managers to improve the management of their best execution requirements, while methodically and prudently allocating research payments.

The lack of transparency in explicit commissions within fixed income and foreign exchange markets (i.e., embedded within the bid-ask spread), does not preclude these asset classes from being actively measured and monitored for the cost of research versus value received using internal estimates. However, asset managers' responsibility does not stop at estimating explicit costs. It is also necessary to centralize **transaction cost analysis** (TCA), in a harmonized framework for pre-trade and post-trade analysis. Centralizing these controls and feedback loops better positions firms to close gaps and leverage cross-asset pricing and relationships.

Centralized oversight of costs is a key success criterion for centralized trading. It provides transparency internally and a better overall view of broker relationships; and promotes discipline and lower research costs for clients. It is imperative that firms can readily demonstrate that the value received in research is commensurate with the amount paid. This is possible with effective benchmarking tools.

CHAPTER KEY TAKE-AWAYS

- Developing best practices for centralized trading requires consideration of regulations with a global, multi-asset, multi-client lens.
- Where legislation is less specific for implementation within a centralized framework, we seek to offer practical solutions that uphold the intent of the legislation and put clients' best interests first.
- Governance best practices for centralized trading include:
    - putting clients first in all decisions;
    - implementing a cross-asset best execution approach that is managed through a centralized desk;
    - segregation of trading duties; and
    - centralizing back and front office controls and oversight through a single OMS.

Measuring and managing all cost centrally, through centralized data management and with support from an independent benchmarking firm.

See the KEY CRITERIA CHECKLIST for Regulatory Requirements best practices

GOVERNANCE 

Following 2008, media cited corporate governance scandals as contributing to the financial crisis, causing investor confidence in the integrity of the capital markets to decline. Unfortunately, high-profile systemic risks connected to trading venues and abusive trading practices that went undetected since the crisis and have further damaged investor confidence. The Facebook IPO at NASDAQ on May 18, 2012 is an example of a trading system failure caused by a programming error. Another example is Knight Capital's trading failure on August 1, 2012, where a software programming mistake led to four million executions involving 397 stocks. In these cases, damage was not only done to the companies, (e.g., Knight Capital which lost $400 million in the incident) but also to the broader public due to a loss of confidence in financial markets.[20]

On May 6, 2010, a flash crash occurred when an oversized **market order**, which was too large given the liquidity available in the order book, was placed. In this instance, a large buy-side institutional trader at Waddell & Reed Financial Inc., (W&R) tried to sell $4.1 billion in E-mini S&P 500 **futures contracts** in a short period of time, using an **algorithm**. The E-mini contract prices dropped approximately five per cent in five-minutes, and then recovered over the next 10 minutes.[21] As capital markets are highly interconnected, options, ETFs and stock markets were all impacted. Some stocks dropped 99 per cent while others were up more than 1,000 per cent. Liquidity providers pulled their orders amid the price volatility, further exacerbating price moves.[22] The event was the result of a failure to implement sufficient controls, as adequate centralized oversight was not in place. W&R should have required the use of **limit orders**, instead of market orders, to mitigate losses, as well as adequate training on how the algorithm would respond to changes in liquidity as the trade progressed.

Exposure to errors and lack of oversight pose significant risks for asset managers and their clients – not only due to lack of experience in trading, but also malevolence including fraud, embezzlement, front running, and other market manipulation. Malevolent orders are created to deliberately disrupt markets, personally gain, or retaliate, such as in the case of an aggrieved employee. **When individuals do not bear the full cost of their actions or perceive that their actions will go undetected in a fragmented framework, they tend not to be as careful in avoiding damage to the firm and clients. Fragmented trading exposes an asset manager to a lapse in ethics and morals as people have an opportunity to bend the rules. Institutionalizing processes and oversight through centralized dealings, enabled by technology, better aligns incentives, and reduces the risk of reputational and financial damage.**

Clients are now acutely aware of the importance of a strong governance framework, both for externally held investments in corporations, and within their investment fund managers. Changes in regulations now require stronger governance to protect financial markets and investors, and asset management

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[20] CFA Institute Program Curriculum 2020 Level II, *Section 6.2 Systemic Risks of Electronic Trading*

[21] Staff from US CFTC and US SEC. (2010). *Findings Regarding the Market Events of May, 6 2010.* **https://www.sec.gov/news/studies/2010/marketevents-report.pdf**

[22] CFA Institute Program Curriculum 2020 Level II, *Section 6.2 Systemic Risks of Electronic Trading*

firms' trading operations are under heightened scrutiny. World-class asset managers continually review their governance frameworks to ensure best practices.

The CFA Institute *Corporate Governance Manual* defines corporate governance as,

> *"The system of internal controls and procedures by which individual companies are managed. It provides a framework that defines the rights, roles and responsibilities of various groups . . . within an organization. At its core, corporate governance is the arrangement of checks, balances, and incentives a company needs in order to minimize and manage the conflicting interests between insiders and external shareowners."*[23]

The manual further highlights that good corporate governance practices seek to ensure that,

> *"Appropriate controls and procedures are in place to cover management's activities in running the day-to-day operations of the company."*

EFFECTIVE GOVERNANCE COMPONENTS FOR CENTRALIZED DEALINGS

Simply put, governance is the structure a company puts in place to ensure it is well run. A world-class governance framework in trading reflects a fiduciary's primary obligation to act in a prudent manner, and in the best interests of clients. Considerations such as, allocation of authority and responsibilities, oversight, and controls and trading processes should be outlined in a governance framework, and backed by more prescriptive procedures including auditing, testing, and monitoring. We have developed the following Principles to guide asset management firms in creating an effective governance framework:

GOVERNANCE PRINCIPLES ("Principles")

Principle 1: Best interests of clients, ahead of individual interests.

Principle 2: Transparency across firm, with management, audit, compliance, and risk teams.

Principle 3: Accountability and integrity, conflicts of interest and moral hazards minimized.

Principle 4: Centralized controls and oversight.

Principle 5: Operational and technological efficiency.

Principle 6: Transparency with clients.

Principle 7: Performance focused, with collaboration across the firm.

Principle 8: ESG integration across the firm.

[23] CFA Institute. (2018). *The Corporate Governance of Listed Companies: A Manual for Investors, 3rd ed.* **https://www.cfainstitute.org/-/media/documents/article/position-paper/corporate-governance-of-listed-companies-3rd-edition.ashx**

In consideration of the Principles outlined, and recommendations from leading global organizations such as the CFA Institute and Basel Committee we consider four key areas of an effective governance framework with respect to centralized dealings for asset managers: (1) Realignment of Roles Enabled by Technology, (2) Centralized Controls and Commission Oversight, (3) Mitigation of Other Risks, and (4) ESG Integration.

1. **REALIGNMENT OF ROLES ENABLED BY TECHNOLOGY**

   Leading technology is an essential component of good governance in trading as it enables operational efficiency and realignment of roles within a firm based on core competencies.

   There are many causes for inefficient operations. Asset managers that experience periods of rapid growth may find that trading and back-office functions were historically conducted by a small number of staff due to resource constraints. In addition, many long-standing asset management firms still have decentralized order and trade management activities performed in multiple, stand-alone systems and spreadsheets. Portfolio managers model and analyse trades and sometimes execute their own orders, using disparate data sources and in-house systems. These firms have not automated their workflows to drive efficiencies, straight-through processing, and trade compliance. In many cases, front-office staff continue to perform back-office functions as portfolio managers cannot rely on automated processes. Front office roles and responsibilities in trading and portfolio management are also often misaligned based on expertise.

   Failure to update technology to include a leading order management system leaves asset management firms exposed to fraud and error caused by decentralized controls. Misalignment of core competencies among front and back-office staff can also cause operational inefficiencies and lead to missed opportunities as front-office staff take time away from their investment responsibilities to perform operational tasks. Failure to separate the trading and portfolio management roles, can lead portfolio managers to become too short-term oriented, flipping their positions in pursuit of short-term profits, rather than acting as long-term asset owners who seek to harvest value in their portfolios over time. Finally, given the rapid changes in technology and market structure, failing to manage the cost of trading with centralized experts, exposes asset managers to the strong possibility of increased transaction costs. **Dividing the trading and portfolio management functions, enabled by upgrades to technology, is imperative from the standpoint of operational efficiency and can be a comparative advantage in the investment management process.**

   The table below contrasts the core competencies needed to succeed in the roles of a buy-side trader and an active fundamental portfolio manager. Trading expertise is acquired through repetition, methodical processes, and breadth of exposure to various types and sizes of multi-asset trades under varying and evolving market conditions. Attention to detail and process is essential, as is sourcing liquidity, and managing speed of execution and information leakage. The inherent value of the asset is somewhat irrelevant to the trader. By contrast, portfolio managers who can see past short-term variations in price are able to focus on the long-term growth potential of their investments. Portfolio managers' skills are demonstrated when they apply unique insights, through considerable research into security selection and industry dynamics.

Comparison of Skill Requirements

Buy-Side Trader	Active Fundamental PM
• **Short-term Timing Decisions** - urgency of order vs. liquidity constraints - management of information leakage	• **Long-term Investment Decisions** - active ownership - ability to withstand short-term setbacks
• **Best Execution Expertise** - cross-asset trading insights - negotiation of price - negotiation of OTC trade terms - access to deal flow - sourcing liquidity - broker selection - algo selection, order type selection - real-time trade monitoring - market structure analysis - venue selection (e.g., lit vs. dark)	• **Portfolio Construction Expertise** • **Security Analysis** - discounted cash flow analysis - management and ESG assessments - financial performance and debt profile - relative value analysis • **Sector / Industy Analysis** - economic fundamentals - long-term trends and themes
• **Operational and Risk Management** - adherence to compliance controls - adherence to risk limits - adherence to escalation procedures - adherence to dealing procedures - adherence to client fair-trade allocation - pre-trade and post-trade analysis - allocation of research payments	• **Portfolio Risk Management** - concentration risk - risk of default - compliance to pooled fund policies

We view the implementation of a leading order management system as a key success criterion for centralized dealings. Alongside this system upgrade, some firms may require the creation of an **Investment Book of Records** (IBOR). The centralization of order and execution management via a leading OMS reduces manual activities and enables straight-through processing of trades. This framework promotes harmonized and transparent processes, and realignment of roles and responsibilities based on core competencies. Portfolio managers are empowered with additional time to focus on their investments, while traders can focus on gaining cross-asset insights and meeting increasing demands due to changes in market structure and technology. This framework removes operational activities from investment teams and operational teams from the trade execution process.

2. CENTRALIZED CONTROLS

Exposure to errors and lack of centralized oversight pose significant risks for asset managers and their clients – not only due to lack of experience in trading, but also malevolence including fraud, embezzlement, front running and other market manipulation.

In 2003, courts awarded over $12 million in restitution to several U.S. pension plans following a series of losses incurred due to fraud at their pension fund manager, Albriond Capital Management.[24] In one of the convictions, they found Alan Bond, former president and chief investment officer, guilty of directing client trades and other investment business to brokers in exchange for taking $6.9 million dollars in illegal kickbacks. Bond used the money to purchase more than 75 luxury and antique automobiles, a large home and a beachfront condominium in Florida.[25] Cases like this highlight the importance of a best-in-class control framework, to impede losses, and damage to clients and the firm due to conflicts of interest.

By consolidating controls within a single OMS, asset management firms can centralize the oversight function of various departments. An OMS with cross-asset capabilities increases the breadth and depth of pre-trade and post-trade monitoring and automates compliance rules. It provides improved reporting and real-time monitoring tools to support senior management for decision making, and improved oversight of compliance, audit, risk management, and trading desk procedures. When standard trading procedures do not resolve issues, centralized dealings facilitate escalating matters to higher levels of leadership in an organization.

Best practices require trading directives with the following components related to centralized dealings:

- **Cross-asset monitoring of portfolio positions and exposures by senior management.** Management accesses real-time cross-asset views of client positions, transactions, market data, performance, risk metrics and analysis. This centralized oversight facilitated by a best-in-class OMS reduces the moral hazard of employees who might otherwise engage in risky behaviour.

- **Segregation of duties** among: (1) the authorized portfolio manager who initiates the trade, (2) the trader who executes the trade, (3) the back-office individual who instructs the custodian to book the trade, and (4) the accountant who reconciles the book of records.

  As we highlighted previously in the ***Regulatory Requirements*** section, legislation in some jurisdictions recommends that no single individual has unrestricted authority to do all the tasks listed above.[26]

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[24] Fulman, R. (2003). *Pension plans awarded $12 million in restitution from Bond fraud case*. **https://www.pionline.com/article/20030609/PRINT/306090707/pension-plans-awarded-12-million-in-restitution-from-bond-fraud-case**

[25] Bloomberg News. (2002). *Money Manager Admits to Kickbacks.* **https://www.nytimes.com/2002/10/12/business/money-manager-admits-to-kickbacks.html**

[26] Financial Conduct Authority (FCA). (2011). **https://www.handbook.fca.org.uk/handbook/SYSC**

Even in the absence of legislative requirements, firms should outline a dealing structure with centralized controls within their procedures that minimizes moral hazards, including a lapse in ethics. Fragmented trading creates an opportunity to bend the rules due to a lack of oversight. When individuals do not bear the full cost of their actions, they tend not to be as careful in avoiding damage to the firm and clients.

- **Fair and equitable trade allocation and aggregation policies for client accounts**. Proper scrutiny and transparency over the method for allocating trades helps mitigate error, ensure fair dealings, and reduce potential conflicts of interest generated by broker relationships. For example, a fair allocation method needs to be in place for two portfolio managers buying the same bond for different accounts within a short period.

- **Pre-trade and post-trade cross-asset oversight that is standardized and automated with compliance rules within an order management system**. Trading directives should require pre-trade analysis, recorded and monitored from a centralized trading desk within an OMS, in order to demonstrate that clients received a fair price, ex-post. A leading OMS is integrated with **execution management systems** (EMS) for pre-trade transaction cost analysis by traders, in a continuous workflow.

- **Pre-trade ESG compliance rules, including monitoring changes to cross-asset exposures in real-time.** For example, in a highly developed centralized trading environment, an OMS could enable real-time compliance rules, which monitor for a pre-determined maximum aggregate debt and equity exposure to carbon-intensive energy producers.

- **A cross-asset definition of best execution,** in consideration of all aspects of the trade, to determine the best value and the best result for clients. Firms should define best execution within their policies, including legislative requirements, supplemented with additional details on a cross-asset basis. The process of monitoring best execution arrangements should be centralized and codified in the OMS to the extent possible.

The CFA Institute's Asset Manager Code[27] outlines the ethical and professional responsibilities of firms that manage assets on behalf of clients. Centralized trade allocation processes, monitoring of commissions payments, and record keeping are essential to demonstrate fair dealings after the fact.

[27] CFA Institute. *CFA Institute Asset Manager Code 3rd Edition.* (2017). **https://www.cfainstitute.org/-/media/documents/code/amc/asset-manager-code.ashx**

THE CFA INSTITUTE ASSET MANAGER CODE

The code states that firms must,

> *"use commissions generated from client trades to pay for only investment-related products or services that directly assist the Manager in its investment decision making process…"*

3. OVER-THE-COUNTER TRADING OPERATIONS

Since the financial crisis in 2008-09, the public, investors and regulators have focused attention on increasing transparency and reducing counterparty credit risk in over-the-counter derivatives markets. In 2013, the Basel Committee on Banking Supervision (BCBS) and the International Organization of Securities Commissions (IOSCO) released a policy framework that establishes minimum standards for margin requirements (collateral) for non-centrally cleared (over the counter) derivative transactions. One of their goals is to offset losses caused by the default of derivatives counterparties by ensuring that collateral is available.

Given these changes, asset managers have been reviewing their legal, operating, and back-office frameworks, and are putting in place margin requirements as appropriate. The following outlines recommended governance practices within a centralized framework that both protect client assets and maximize the benefits of inventory.

- **Principal ISDA and CSA partners do not face subaccounts, only the parent corporation**

  When entering an ISDA or CSA agreement, depending on the statutory framework of the organization and jurisdiction, it may be possible to act as Principal, a direct agreement between the parent organization and the counterparty. Alternatively, the corporation may choose to negotiate agreements backed directly by the subaccounts or pools. A strong governance framework has the firm face the counterparty as Principal. Key benefits include the ability to net counterparty positions across funds and measure margin requirements in aggregate. Counterparties do not have direct recourse to client investments in the subaccounts.

- **Centralized management of collateral and funding activities for derivatives across the firm and across investment funds**

  In some asset management firms, collateral is managed on a fund by fund (or pool by pool) basis. This approach is not efficient and could lead to higher collateral funding requirements for each of the funds. A consolidated framework ensures this does not happen and aligns client interests at the total portfolio level. Centralized management maximizes liquidity, inventory, and availability of collateral. During volatile market events, the firm distributes inventory across funds using a waterfall distribution and avoiding transactions in the market. Through optimization, they can deliver lower-quality securities and retain and protect higher-quality assets.

- **Tri-party collateral arrangements**

  Asset managers may choose to fully segregate client collateral through a tri-party agreement. Tri-party arrangements have a primary benefit of full segregation and custody of collateral securities. Rehypothecation of collateral is not permitted, meaning the custody bank cannot use the collateralized securities for its own gain. In the event of default, client collateral assets are protected and stay within the firm. By contrast, if the collateral was comingled, the firm would need to compete with other firms to receive the collateral from the counterparty.

4. MITIGATION OF OTHER RISKS

Failure to consider the risks of a decentralized dealing area can leave an asset manager exposed to unexpected consequences. Reputational risks can be extremely damaging, causing a cascading effect on other business areas, including the potential to lose high-profile clients.

Strategies with higher tail risks bring about several notable questions:

> *Given that position sizing is the most effective tool to manage the risk of these strategies, are position sizes with trading limits set out in the pooled fund policy?*
>
> *Are trades sent through a centralized dealing desk with segregation of duties between the portfolio manager and the trader? If the trades are sent through a centralized desk, do the automated compliance controls detect any breaches to the trading limits? Are any trades unreported or unrecorded?*
>
> *Is a centralized OMS in place to help senior managers monitor the fund's positions, transactions, performance, and risk levels on a real-time basis? Is a **stop loss** strategy in place via centralized controls, overseen by senior management? Will it be executed?*

The development of good governance practices in trading, implemented through centralized controls and dealings, can play a vital role in lowering the reputational, legal, and operational risks of an asset management firm.

- **Reputational risks, resulting from conflicts of interest and other governance failures, can bring significant damage and associated costs to an asset manager, if improperly managed.** Within the context of trading, concerns over reputational risk most often relate to two stakeholder groups: clients and broker partners.

  As markets and regulations evolve rapidly, and asset managers adapt and grow, client beliefs and expectations rise in tandem. What may have been sufficient to meet an asset manager's fiduciary obligations to clients in the past, may no longer meet client expectations. During periods of rapid change, firms need to be even more aware of once-acceptable business processes that clients no longer consider satisfactory and move quickly to close the gap in how they operate.

Furthermore, broker partners consider asset managers' level of sophistication and reputation when determining access to deal flow, pricing, and quality of coverage. In a trading context, brokers can easily identify when they have an information advantage over a portfolio manager or trader who they see as less skilled and take advantage of the situation.

> ***"The trading desk has implemented a policy prohibiting one-to-one side chats with broker partners. We use a centralized group chatroom for all conversations. The rationale for this is to avoid the potential for predatory behaviour that could occur if a broker tried to take advantage of a trader's goodwill or lack of experience. This policy also reduces the risk of error, as all trade terms are socialized, and overseen by senior staff."***
>
> ***~ British Columbia Investment Management Corporation (BCI) Trading Desk***

Reputational damage may be inadvertent within a decentralized trading framework. For example, two traders could be trading on both sides of the same trade. If interacting with the same broker, this could cause that broker to earn a full spread on flow that the asset manager could have internalized at no cost. The manager in this case loses twice, first on the spread, and second on the damage to its reputation with the broker partner.

- **Firms can reduce the frequency and severity of legal damage with a strong governance framework, centralized controls, and segregation of duties.** Legal risks can result from numerous activities linked to trading, such as fraud, market manipulation, tipping and other abuses. No firm is immune to these occurring. However, asset managers are responsible for mitigating the risks.

- **Asset managers can also materially reduce operational risks by centralizing trading and standardizing and harmonizing processes.** A leading OMS can facilitate reducing manual activities and spreadsheets, enabling straight through processing (STP) of trades, and automating other functions like trade adjustments, corporate actions and additions of new securities.

5. ESG INTEGRATION

Firm-wide centralized dealings present a unique opportunity to integrate corporate and client ESG approaches. As asset managers strive to be world class, they are increasingly looking to integrate ESG factors into the evaluation of their investments and all investment decisions. This is certainly the case with the large Canadian pension funds, who use their position as long-term asset owners to influence investee companies, partners, and external managers to advance responsible investing, in alignment with the interests of long-term investors.

By way of example, the University of Toronto Pension Fund holds the investment belief that *"incorporating relevant and material ESG issues into our decision-making processes is consistent*

with our fiduciary duty."[28] Their approach to responsible investing includes the following principle and actions:

We will incorporate ESG issues into investment analysis and decision-making processes.

- *Evaluate ESG risks across all portfolios.*
- *Integrate consideration of ESG factors into our investment and operational due diligence policies, and into other policies.*
- *Incorporate ESG considerations into our manager selection and monitoring processes.*
- *Support development of ESG-related tools, metrics and analyses.*
- *Encourage academic and other research on ESG integration.*[29]

Many asset managers have similar internal policies. By coordinating business relationships from a single trading area, firms can evaluate broker-dealer partners' ESG practices, and can influence development of ESG-related tools, metrics and analyses. One voice, which prioritizes ESG practices, is an important way to reduce the reputational risks to asset managers. We recommend the following steps to achieve this goal:

Step 1: Develop and send a short questionnaire as part of the due diligence process when reviewing and/ or considering onboarding new broker partners.

Step 2: Use the questionnaire responses, together with public disclosures, corporate policies, and discussions with the broker to assess strengths and weaknesses of their ESG policies and practices

ESG areas of assessment:

1. Strength of policies
    i. RI/ ESG Policy
    ii. PRI signatory, other PRI committees, industry associations, etc.
    iii. Diversity and Inclusion Policy
2. Accountability and oversight
    i. Presence of centralized, dedicated ESG professionals
    ii. Presence of an ESG committee
3. Evidence of ESG integration in processes
    i. Link and integration between the parent and trading business unit
    ii. Integration in the investment recommendation process for research teams
    iii. Specific ESG factors research teams consider
    iv. Engagement with companies on ESG issues

[28] Fein, M. L. (2019). *ESG Investing by Pension Fiduciaries in Canada.* **https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3431230**

[29] Ibid. Pg. 14

4. Dedication of resources and tools
    i. Tools for gathering ESG data, resources and training for analysts
    ii. Full-time staff dedicated to ESG

Step 3: Develop minimum expectations and influence improvements. From a centralized trading desk, manage firm-wide relationships to promote the integrity of the capital markets and monitor for the presence and quality of ESG disclosures in sell-side research materials. Identify where there are weaknesses and seek to engage with broker partners to improve their practices, without being prescriptive in the approach. If no improvements are forthcoming, consider terminating the relationship, if the risks are greater than the benefits to clients.

Integration of ESG criteria in broker partner reviews can mitigate reputational risk, and better align ESG analysis in sell-side research with an asset manager's needs.

CHAPTER KEY TAKE-AWAYS

- High profile governance failures have eroded investor confidence and trust. As client expectations are rising and there is increased scrutiny on governance practices, the implementation of centralized dealings enables firms to implement strong governance practices, reduce risk and meet client expectations.
- A world-class governance framework in trading reflects a fiduciary's primary obligation to act in a prudent manner, and in the best interests of clients. Considerations such as, allocation of authority and responsibilities, oversight, and controls and trading processes should be outlined in a governance framework.
- Adoption of leading technology is an essential component of good governance in trading as it enables operational efficiency and realignment of roles within a firm based on core competencies.
- As asset managers strive to be world class, they are increasingly looking to integrate ESG factors into the evaluation of their investments and all investment decisions. Firm-wide centralized dealings present a unique opportunity to integrate corporate and client ESG approaches.

See the KEY CRITERIA CHECKLIST for Governance best practices

WORK FROM HOME?

The Covid-19 pandemic forced asset managers globally to rapidly adapt to working from home. Technology and security breaches top of mind initially, are now largely resolved. Firms have adapted. As we reflect on the past year, several questions come to mind:

> *What were the main compliance and controls concerns during the transition? What do we need to do differently going forward to address these?*
>
> *Are there opportunities post-Covid to maintain a hybrid centralized trading team that combines working from the office and home? Is working from home better?*

THE WORK FROM HOME TRANSITION

Within days, firms implemented business continuity plans, shipped equipment, and set up new workstations. Trading teams dispersed. Technology and infrastructure issues were rampant – broadband connectivity was poor in some cases, cyber security risks increased, and phone conversations were not always being taped.

One way to gauge the impact of working from home on security breaches is to look at the number of alerts or incidences reported by fintech companies that provide conduct surveillance to financial organizations. Some banks, hedge funds and asset mangers use data analytics to help monitor for compliance and front office breaches, including insider and rogue trading. Behavox, Digital Reasoning and EY are providers of such software systems that compliance officers can use to monitor traders for potential insider trading, market manipulation and threats like the potential leak of proprietary data. They use artificial intelligence in algorithms to screen email and chat data, and voice biometrics to track phone calls on trading desks.

In May 2020, as firms initially moved to working from home, Behavox saw an 18 per cent rise in conduct being escalated for further review since March. Conduct being reviewed ranged from swearing to disclosing client names, and included prohibited activities such as taking conversations private, using personal email, and giving financial advice to family and friends, according to Erkin Adylov, CEO of Behavox[30].

> ***"These kinds of breaches typically don't happen, but right now there is a noticeable increase. In your kitchen or spare bedroom there is no colleague to monitor what you are up to and what we are seeing across a number of clients is a spike in escalations," Adylov said.*** [31]

Tim Estes, the CEO of Digital Reasoning, saw a similar trend. He said banks were digging through backlogs from an "incredible spike" in alerts, hiring teams to do initial reviews.

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[30] Jones, H. (2020). *Home trading triggers bank 'black hole' surveillance alerts.* **https://www.thechronicleherald.ca/business/reuters/home-trading-triggers-bank-black-hole-surveillance-alerts-454880/**

[31] Ibid.

> ***"They know that within the enormous backlogs there are likely incidents of insider trading or market abuse," Tim Estes said.[32]***

Rachel Sexton, head of EY's financial services forensic and integrity practice in London.

> ***"Some processes have been harder to implement in lockdown, such as the control of inside information," she said.[33]***

Things have improved since the first few chaotic weeks at the onset of the pandemic, when trade surveillance was challenged both by a remote workforce and market volatility. IT professionals resolved many of the connectivity issues; traders moved to Bloomberg messenger when voice recordings were not possible; cyber security risks were assessed and addressed; and remote compliance measures were updated and refined. Working from home is not simply a duplication of office control environments. A tailored approach is required.

CONTROLS AND COMPLIANCE

Insufficient controls in a work from home environment relate to: (1) record keeping, (2) control of sensitive information, and (3) governance and culture best practices.

- Regulators and compliance officers have strict rules around the recording of client and trading information communicated by voice. The European Securities and Markets Authority (ESMA) under MiFID II and the Financial Conduct Authority (FCA) both require firms to record voice communications with clients when in receipt, transmission or execution of client orders, or when dealing with their own account. At the same time, ESMA "recognises that, considering the exceptional circumstances created by the COVID-19 outbreak, some scenarios may emerge where, notwithstanding steps taken by the firm, the recording of relevant conversations may not be practicable (for example due to the sudden remote working by a significant part of staff, or the lack of access by clients to electronic communication tools)." However, in such exceptional scenarios ESMA still expects firms to consider what alternative steps they could take to mitigate the risks related to the lack of recording, such as through written minutes or notes of telephone conversations, subject to prior information being provided to the client of the impossibility to record the call and that written minutes or notes of the call will be taken instead.[34] Similarly, because of Covid-19, the US Commodity Futures Trading Commission issued "no-action" letters temporarily softening their obligations relating to the recording and record keeping of oral trade details.[35] Given the time to adapt to remote working conditions, this relief expired in March, 2021. **Firms must be able to duplicate recorded phone lines and monitoring**

[32] Ibid

[33] Ibid

[34] European Securities and Markets Authority (ESMA) *COVID-19: Clarification of issues related to the application of MiFID II requirements on the recording of telephone conversations* (2020). **https://www.esma.europa.eu/sites/default/files/library/esma35-43-2348_esma_statement_on_covid-19_telephone_recording.pdf**

[35] Commodity Futures Trading Commission (CFTC), No-Action Positions for Floor Brokers and Introducing Brokers from Oral Communications Recordkeeping Requirements and Designated Contract) Markets from Audit Trail Requirement in Continued Response to the COVID-19 Pandemic (Jan. 19, 2021), CFTC Staff Letter No. 21-04, (Expired on Mar. 31, 2021), **https://www.cftc.gov/csl/21-04/download**

processes in a work-from-home environment. Video calls with brokers regarding financial information and transactions must be banned or monitored and recorded.

- **Control of sensitive information is a greater challenge when working from home.** Temptations arise to use personal devices to ease communication, or because devices are readily on hand.

> ***"Many firms have a hard and fast rule about not using personal mobile devices on trading floors. If you are working remotely, these are things that are harder to manage," said Martin Pluves, chief executive of the FMSB, the standards-setting body for the fixed income, currency and commodities markets.*** [36]

Another area of concern is privileged information, such as portfolio managers' buy and sell decisions within earshot of others at home. Working from home does not absolve an individual of their obligation not to relay material, non-public information.

Safeguarding sensitive information can be challenging and may require additional investments. **Firms must set up dedicated workstations, and not try to cut costs by allowing shared devices. Traders who do not have a private location at home for their office, must be provided an alternative.**

- **Physical absence from the office also raises cultural questions. If a strong sense of belonging doesn't exist, the physical distance from others may make the rules and regulations we need to follow seem less important.** When individuals do not bear the full cost of their actions or perceive that their actions will go undetected, they tend not to be as careful in avoiding damage to the firm and clients. Furthermore, for many, working from home can add additional stress, anxiety, and other mental health issues. Without face-to-face, personal ongoing interactions, the wellbeing and resolve of some employees may be impacted, and in return effect their mindset in ethical decision-making. Further challenging the situation is the fact that managers can normally keep a pulse on the morale of employees through their daily, informal, in-person interactions. It is necessary to establish new ways to accomplish this in a remote environment and provide training and support for handling feelings of isolation and loneliness. **Working from home introduces different risks to a lapse in ethics and morals. Warning signs may go undetected if the culture is also fragmented.**

In April 2018, the Financial Stability Board (FSB) published *Strengthening Governance Frameworks to Mitigate Misconduct Risk: A Toolkit for Firms and Supervisors.*[37] This document provides a toolkit that buy-side and sell-side firms can use in designing their risk frameworks to mitigate the risk of misconduct. Our view is that many of the tools in this guide as they relate to trading are best implemented in a centralized dealing structure. For example, in the discussion

[36] Financial Times. *How coronavirus turned the business of trading at banks on its head.* **https://www.ft.com/content/8066154d-83c4-49a6-97d4-4c3c65684136**

[37] Financial Stability Board (FSB). (2018). *Strengthening Governance Frameworks to Mitigate Misconduct Risk: A Toolkit for Firms and Supervisors* **https://www.fsb.org/wp-content/uploads/P200418.pdf**

of culture, the FSB notes that culture has a strong impact on the likelihood that misconduct will occur**. They articulate seven tools to mitigate cultural drivers of misconduct, and summarize the influential elements of culture on misconduct as follows:**

> *"The **leadership** of a firm, which sets the organisation's direction and the tone from the top and thus, through role modelling, influences the behaviour of staff;*
>
> *The **decision-making** process, including how decisions are made, challenged and communicated; and*
>
> *The **values and behavioural norms** of the firm, which collectively reflect and support the firm's purpose and its activities."*

Despite its challenges, working remotely has effectively increased the level of direct communication between leadership and staff. Through virtual platforms and digital technology, executives are more accessible and connect more often through virtual town hall meetings, video and podcast updates, and chatrooms. Traders can readily observe the tone from the top, understand decision-making processes, and share values and behavioural norms.

Institutionalizing values, behavioural norms and processes through role modeling and decision making with centralized dealings, aligns a healthy culture with a strong governance framework. This reduces the risk of reputational and financial damage and can be achieved while working from home. When culture is not enough, strong oversight leads corrupt traders to fear that they will be caught, dissuading them from committing crimes and potentially taking them out of the industry.

OPPORTUNITIES IN A WORK FROM HOME SETTING

There are two primary opportunities in a work-from-home option for traders: (1) an increased culture of belonging and inclusivity, and (2) flexibility to hire globally.

- Employee engagement depends on providing a reasonable amount of flexibility to meet personal or family needs. By allowing traders to work remotely, firms and managers may increase the feeling of belonging of employees who require this flexibility. A feeling of belonging and inclusivity may reduce the likelihood of rogue behaviour.

- Talent for niche trading roles is difficult to find in a global setting, let alone locally. **By allowing individuals to work remotely, firms significantly broaden the applicant pool.**

CHAPTER KEY TAKE-AWAYS

- The benefits of centralized trading do not require one physical location. However, asset managers must tailor their approach to address the risks of working from home to ensure the effectiveness of surveillance is not diminished.
- To successfully manage work from home operations asset managers should consider the following best practices:

- Build and foster a culture of inclusivity and belonging with the centralized trading team and the firm.
- Increase vigilance around the protection and surveillance of insider information.
- Ban the use of personal/ shared devices for communications with broker partners.
- Ban the use of personal side chats with broker partners, in favour of centralized group chatrooms with management oversight;
- Log every conversation including video calls, and chat functions;
- Ensure security of information including the privacy of conversations and written notes at home; and
- Require staff to attest to compliance regularly.

See the KEY CRITERIA CHECKLIST for Work From Home best practices

MARKET STRUCTURE AND CROSS-ASSET CONSIDERATIONS

Trading has evolved significantly over the past decades to the fast-paced, globally connected environment we have today. For example, a trader waking up in Canada, turns on Bloomberg radio to learn that Asian and European markets fell overnight, and immediately predicts a drop in E-mini S&P 500 futures contracts and rising bond prices in what could be a risk-off day. The trader expects the Canadian dollar has fallen vis-à-vis the majors and oil prices may be lower. This example is to illustrate that markets do not trade in asset class isolation – they are being kept in cross-asset alignment, and, globally, capital markets are fully integrated. Given this, why are some firms still trading in asset class silos?

In this section, we discuss the rise of multi-asset trading desks among institutional investors, driven by: (1) growth in cross-asset strategies, (2) increased in-house asset management, (3) regulatory changes and the electronification of markets, and (4) developments in trading platforms and increased demand for data from the buy side.

These trends, separately and collectively, are leading many asset management firms to view orders based on their investment complexity, liquidity and the trading skill required, rather than by the corresponding asset class. Traders with more experience and expertise are handling "**high-touch**" bespoke, cross-asset transactions, while more junior traders handle "**mid-touch**" orders which require less skill but have higher volumes, and any remaining "**low-touch**" trades are increasingly executed through automated processing. We discuss each of these trading segments in more detail. Finally, we outline key success criteria regarding market structure and cross-asset trading for firms to consider, prior to implementing centralized trading.

THE RISE OF MULTI-ASSET CLASS TRADING

Multi-asset investing and trading have been increasing over the past 30 years, and, in particular, following the 2008-09 financial crisis. The fiduciaries of smaller and mid-sized pensions, trusts, endowments, insurance funds, and other funds feel increasing pressure to hire investment consultants to protect themselves from the potential liability of mishandling plan investments. Consultants, in turn, are recommending a broad diversification of strategies, asset classes and asset management firms to protect their clients.

Over 2/3 of buy-side traders trade multiple instrument types

~ 2019 Greenwich Associates

Mutual fund companies are continuing to expand their fund offerings into cross-asset strategies, in part in response to the global shift from defined benefit to defined contribution plans. In a defined contribution framework, plan beneficiaries select from a large suite of multi-asset funds to implement their personalized asset mix. The private wealth management industry, including brokerage firms, discretionary managers and other retail providers is also focusing on providing clients a growing number of choices. These can include traditional multi-asset balanced portfolios, target-date funds with an asset allocation that varies over time, and stand-alone products managed and rebalanced on a holistic basis.

At the same time, institutional fund managers with a long-term investment horizon have increased their exposure to alternative asset classes, such as absolute return, private equity, infrastructure, and real estate. Sovereign wealth funds have been an important influencer of multi-asset strategies, given their

broad, global mandate. Norway's sovereign wealth fund, for example, with over $1 trillion in asset under management, requires global diversification by strategy and geography to deploy the funds that they have. Similarly, endowments like Harvard and Yale's are prime examples of very long-term oriented investment funds. They are typically set up to operate in perpetuity and only use the returns from the investments, not the principal. As a result, well-diversified asset mixes are a natural fit for their investment needs.

1. GROWTH IN CROSS-ASSET STRATEGIES

Multi-asset investment solutions are increasingly important to sophisticated institutional investors. At the total fund level, they are using diversification and trying to incorporate different asset allocation methods to improve risk-adjusted performance beyond conventional **liability driven investing** (LDI) approaches and unlevered 60/40 equity/bond portfolios using **mean-variance optimization**, including **risk parity** and **risk budgeting**, and **factor-based** approaches.

At the investment level, cross-asset, "go anywhere" approaches to investing are more prevalent. Some investors have found that the above-mentioned risk parity and factor-based asset allocation approaches are difficult to implement at the total fund level[38]. As a result, asset managers are seeking diversification and excess return at the strategy level. They are giving their portfolio managers a broader universe and tool kit to add value, allowing them to use all their skills and strategies, and to exploit cross-asset anomalies. In turn, portfolio managers are building **absolute return** and **hedge fund** strategies such as **global macro**, **managed futures**, **market neutral**, and **event driven**. The ETF industry is following a similar path. With significant growth in assets under management, top firms like Blackrock, Vanguard, State Street, Invesco and Schwab, are seeing increased demand for actively managed cross-asset funds including thematic, top-down and ESG investing. According to Statista, there was over $6 trillion managed with ETFs in 2019, up from approximately $200 billion in 2003.[39]

With the growth of multi-asset investing, trading is also becoming multi-asset. This has increased the opportunity set for firms as the full potential of a trader's skill is used to discern market information on a cross-asset basis.

Scenario 1: Convertible Bond Arbitrage

Imagine a hedge fund manager attempting to profit from a **convertible bond arbitrage** strategy by taking advantage of the pricing difference between a convertible bond and the shares of the company. Convertible bonds are hybrid securities that can be viewed as a combination of straight debt plus a long equity call option with an exercise price equal to the strike price times the **conversion ratio**. To take advantage of the relative value seen in the convertible bond, they need to send orders to buy the undervalued convertible bond, and to sell short a position in the

[38] Cao, L. CFA Institute. (2018). *Multi-Asset Strategies: The Future of Investment Management.*

[39] Szmigiera, M. (2020). *Worldwide ETF assets under management 2003-2019.* **https://www.statista.com/statistics/224579/worldwide-etf-assets-under-management-since-1997/**

underlying stock. Shortly after the manager sends the orders, takeover news of the company hits the tape and the stock price soars.

This trade could result in two very different outcomes for the client:

DECENTRALIZED TRADING

The stock trader received the equity order and sold the shares.

The convertible bond trader received the bond order. Unfortunately, liquidity was limited, and the trader had not yet purchased the bond when the takeover news was announced.

The hedge fund managers lost a significant amount and scrambled to cover their short position.

CENTRALIZED TRADING

The cross-asset trader received the bond and equity orders.

The trader set up a dynamic spread trade to monitor the conversion price of the bond relative to the current share price. When the spread was in the money, tranches of the bond and equity were executed simultaneously until the entire order was filled.

The hedge fund managers received better pricing and the trader significantly reduced the leg risk of the trade, i.e., being short the equity, but not long the convertible bond.

In the convertible bond arbitrage scenario within a centralized trading framework, the trader dynamically adjusts the quantities while trading to execute the correct amounts in real time. By viewing the full order, the trader can discuss the other exposures in the trade with the portfolio manager, including interest rate risk and the credit risk of the issuer. The trader recommends a combination of interest rate derivatives and **credit default swaps** to isolate and extract the relative cheap embedded optionality of the convertible bond. The trader also gives the portfolio manager pricing information for purchasing put options, instead of selling the stock outright.

Hybrid securities like convertible bonds, and cross-asset trades, are best executed on a centralized dealing desk. A highly skilled cross-asset trader can add significant value to the investment process. For example, a portfolio manager who does due diligence on company fundamentals, decides they want to own a position in a company. Given the trader's level of expertise, the portfolio manager leaves the selection/ recommendation of the security instrument to the trader: debt, equity, or preferred shares.

The skilled trader's role is changing to an advisory capacity. The trader identifies the best way to execute trades, not just the obvious or easiest choice. Portfolio managers looking for credit exposure may be better off with a single-name credit default swap, for example. Equity, credit and interest rate markets all offer swaps, futures, options and ETF alternatives. A skilled trader advises portfolio managers on which instrument provides the lowest overall cost, most liquidity and least basis risk.

Derivatives trading is another area of investing that can benefit substantially from centralized dealings, as it often involves multiple asset classes and requires risk management by trading experts. Total return swaps are an instructive example.

Scenario 2: Total Return Swap

Imagine that during the 2020 Covid-19 market correction, equity swap levels are extremely cheap and indexed portfolio managers want to take advantage of the pricing by going long a total return indexed swap and agreeing to pay **LIBOR** minus a spread. At the same time, liquidity in U.S. corporate bonds is extremely thin. To hedge the exposure to LIBOR, an investor would have to pay spreads of 140bps or more, 14 times higher than normal levels. Nevertheless, there is higher liquidity in Canadian corporate bonds and the pricing for a cross-currency basis swap is favourable.

This trade could result in two very different outcomes for the client:

DECENTRALIZED TRADING

The stock trader received the order to buy a total return swap on the ACWI Index vs LIBOR -20bps. The trader executed the order. Later, a colleague who trades bonds, picked up and executed the corresponding ticket to purchase bonds in the LIBOR pool.

Although the swap levels in isolation were traded at good levels, the client lost money overall due to the spreads in U.S. corporate bonds.

CENTRALIZED TRADING

The cross-asset trader received the order to buy a total return swap on the ACWI Index vs LIBOR -20bps. Before entering the order, the trader lined up the bond trades, which would have been purchased simultaneously to cover the liability. The trader calculated the net benefit for the entire trade and decided to hold off until liquidity in corporate U.S. bonds improved. The trader then reviewed the pricing for a cross-currency basis swap, knowing that liquidity in Canadian government bonds was better. The net benefit of the entire trade (total return swap, cross-currency basis swap and Canadian bond purchases) was now positive.

Overall, the client made money and was much better off.

Insights from multiple assets are more important than ever. In today's environment, centralized dealing desks are best positioned to rapidly respond to cross-asset movements. A great example of this is the 2008-09 financial crisis when an astute multi-asset trader who was familiar with credit default swaps could have perceived the importance of rising European swap spreads to virtually every asset class.

A key success criterion to benefit from centralized dealings is the presence of cross-asset trading investments at the strategy or total fund level, including asset allocation trades.

2. INTERNALIZATION OF ASSET MANAGEMENT

Roughly 3/4 of the assets of the top 10 Canadian pension funds, across a range of asset classes, are internally managed rather than managed by external asset managers.

2015 The Boston Consulting Group

Many asset management firms are increasingly managing assets in-house. They are building internal expertise to reduce costs and exploit competitive advantages in areas they feel they have an edge. External managers are only used in asset classes with unique skills that are difficult to secure in local markets. At the same time, trading volumes executed in-house are increasing, while the number of traders on most desks is shrinking. Not surprisingly, with this shifting landscape the number of asset classes covered by traders is also naturally increasing. Two areas that firms should consider as they internalize assets are transition management and how to support asset allocation trades.

- As firms terminate external managers and bring assets in-house, they may choose to transition the assets themselves. **Transition management requires centralized dealings and global, cross-asset expertise, to achieve best execution.** These trades involve internal coordination among operations, front office staff and the custodian. A mistake or poor decision can be extremely costly to the client's total fund performance. By way of example, imagine a firm decides to fire a long-only external manager with an Asian equity mandate, and transition the assets internally to a new, managed futures fund. The portfolio manager would like to take a short position in U.S. futures, and a long position in fixed income futures, as a model is predicting a correction in the markets and a corresponding drop in yields. At the onset of the trade, the client is overweight Asian equities and Asian currencies relative to the target portfolio. As the Asian trading day goes on, the trader raises cash in several Asian currencies. In a decentralized trading environment, a foreign exchange trader would need to be awake in Asian trading hours to execute the sale of the Asian currencies to USD. Unless the FX trader was involved in the rest of the transition, the FX trader would have limited understanding of the overall context of the trade, which could result in an error or miscommunication. A better approach would be for a cross-asset trader to trade the Asian currencies in tandem with the futures contracts, taking into consideration the liquidity and timing of both sides of the trade. The trader could then systematically assess the need to hedge the exposures. Multi-asset centralized dealings improve risk mitigation and transition management for clients.

- **Asset allocation trades are multi-asset by nature. Allocation models use a market-based framework at the total fund level, which incorporates cross-asset inputs and correlations.** These models never recommend purchasing an asset one day, to sell

another a different day because that would expose the client to too much market risk. Instead, traders should handle the buys and sells simultaneously. Firms that do not manage asset allocation trades centrally are forced to select end-of-day benchmarks to coordinate the cash flows. With the adoption of a leading OMS, asset allocation trades can be much more opportunistic in nature. For example, a firm's investment committee could line up a trade to buy equities and sell bonds, *at a pre-determined level.* The OMS securely warehouse the positions, and the centralized trading desk initiates the trade when the level is reached.

A key success criterion to benefit from centralized dealings is the presence of in-house asset management.

3. IMPACT OF REGULATION, TECHNOLOGY AND DATA ON TRADING MARKET STRUCTURES

The development of electronic market structures in public equities, futures and options have forever changed the way people trade. These markets have become the gold standard in pre- and post-trade transparency, fair pricing, and liquidity. Fixed income and foreign exchange markets are changing to survive. Trading venues and platforms are becoming electronic, and many bond and foreign exchange traders are more comfortable with technology-driven solutions to adapt to the burgeoning market structures, which have been the norm in equity markets for many years.

According to research from Greenwich Associates, 34.4 per cent of investment-grade bonds traded electronically in November 2019, up from 19 per cent in the first quarter of 2018. Similarly, in a survey of top global FX users, they estimated that FX trading volumes executed electronically rose from 43 to 79 per cent, from 2007 to 2018.[40] **The catalysts driving electronic trading in fixed income and foreign exchange markets are regulation (i.e., MiFID II and Basel III), improvements in technology, and demand for data.** We discuss these drivers, which we expect will continue to propel trading on electronic platforms going forward.

- **The 2008-09 financial crisis lit a fire under any regulator who was not already in motion to further protect the interests of clients and create greater transparency in markets**. The changes that have had the biggest impact on trading from a market structure perspective are Basel III's capital adequacy rules for banks, which put an end to **warehousing** large risk positions, and the need for the buy side to demonstrate multi-asset best execution.

  As balance sheet capacity is limited, the sell side changed its strategy to reflect decreased dealings with fixed income managers and redirected business to more profitable areas. They are focusing on cross-selling opportunities with a single point of contact on buy-side trading desks.

  Regulators have traditionally focused on best execution and fair dealings with an equity-only lens. With changes in MiFID and MiFID II, brokers and buy-side firms alike are required to demonstrate cross-asset best execution, which means that firms need an

[40] Source: Greenwich Associates

unprecedented amount of publicly available data across all markets. To prove fair price on a pre-trade and post-trade basis, markets are evolving and becoming more transparent. Even the most illiquid bonds traded on the secondary market, which risk information leakage when posted to a **consolidated tape**, will eventually have the transaction details published.[41]

In the US, regulators are requiring greater transparency and more electronic trading and reporting. In 2001, the US SEC mandated the creation of the **Trade Reporting and Compliance Engine (TRACE)**, which required reporting of a wide variety of secondary bond transactions for the first time. [42] More recently, broker-dealers now must report primary market transactions in eligible securities.[43] In 2018, the SEC voted to increase order-handling disclosure requirements for broker-dealers,[44] which means that brokers will be required to report detailed information about how they trade customer orders, down to the microsecond level across all venues.[45]

- **Data, technology, and an explosion of trading protocols have driven the need to invest in advanced trading platforms and personnel.**

  The links between how we trade, technology and data are not new. In the 1990s many asset management firms implemented their first OMS to automate back-office processes using straight-through-processing. This was the first "centralized dealing" – or at least centralized processing – area in most firms. Over time, increased CPU processor and network speed drove the use of the OMS further**. A real-time connection for trade fills using a FIX line in the OMS, was a key milestone – a rich source of data to measure transaction costs and broker performance.** In tandem, equity market structures became electronic through enhancements in centralized order books, and pre-trade and post-trade reporting transparency requirements. An abundance of data drove developments in equity-only execution management systems, allowing buy-side traders to interact more fluidly with markets. Over time, **the functionality and insights provided by the equity-only EMS have driven demand for multi-asset EMS and TCA solutions.** Trading is increasingly more data-focused, a competitive advantage for asset management firms.

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[41] ICMA (2016). *Evolutionary change: The future of electronic trading of cash bonds in Europe.*

[42] *See* Speech by Chairman Levitt, September 9, 1998, at Media Studies Center, New York, NY, **https://www.sec.gov/news/speech/speecharchive/1998/spch218.htm**; Securities and Exchange Commission (SEC). (2001). Self-Regulatory Organizations; Order Approving Proposed Rule Change and Notice of Filing and Order Granting Accelerated Approval to Amendment No. 4 to the Proposed Rule Change by the National Association of Securities Dealers, Inc., Relating to the Creation of a Corporate Bond Trade Reporting and Transaction Dissemination Facility and the Elimination of Nasdaq's Fixed Income Pricing System. [Release No. 34-43873]

[43] FINRA Rule 6710(c), as amended; Securities and Exchange Commission (SEC). (2009) Self-Regulatory Organizations; Financial Industry Regulatory Authority, Inc.; Notice of Filing of Amendment No. 2 and Order Granting Accelerated Approval of a Proposed Rule Change, as modified by Amendment No. 2 Thereto, Expanding TRACE to Include Agency Debt Securities and Primary Market Transactions [Release No. 34-60726], **https://www.sec.gov/rules/sro/finra/2009/34-60726.pdf**

[44] Securities and Exchange Commission (SEC). (2018) Disclosure of Order Handling Information [Release No. 34-84528], **https://www.sec.gov/rules/final/2018/34-84528.pdf**

[45] Greenwich. (2019). **https://www.greenwich.com/equities/top-9-market-structure-trends-2019**

Fixed income and foreign exchange markets have been slower to embrace the technological advancements made in equity markets, for understandable reasons. The number of bonds that trade, each with unique maturities, coupons and ratings, far surpasses the number of equities, which are fungible across markets. Equities trade hundreds (or thousands) of times per day, where some corporate bonds trade "by appointment only". Buy-side bond investors have relied on OTC markets with market making and balance sheet use as a result. But regulation under Basel III has significantly curtailed market making activities. **As broker capital is less available, traders are using technology to improve liquidity.** The buy side is actively influencing the design and creation of new trading protocols to spur innovations in platforms that will help source, aggregate, cross, route or optimize whatever small amount of liquidity is available. For corporate bonds, for example, order-driven broker capital is no longer the only source of liquidity. "**Fuzzy matching**" is a clear attempt to deal with the increased lack of liquidity, in which traders use this technology to source bonds with very similar characteristics to the ones that they would like to trade. Other attempts to find bond liquidity, include platforms that source and aggregate quotes across markets, ETFs to access the underlying securities via an exchange for physical, and all-to-all electronic crossing networks such as Liquidnet's anonymous, buy-side institutional, electronic platform for corporate bond block trading. Foreign exchange and fixed income markets now are adapting and innovating to survive and keep pace with developments in other asset classes.

There is now an overabundance of ways for buy-side traders to interact electronically with the sell side, and directly with trading venues. A leading OMS helps skilled cross-asset traders manage increased complexity by aggregating trades and transactions using a FIX connection. Importantly, transaction cost analysis, facilitated through an order management system, is now possible on a post-trade basis in all asset classes, a key development in the centralization of trading processes.

With advancements in trading market structures, world-class asset managers are now able to reap meaningful data-driven market insights and achieve best execution through centralized dealings.

A key success criterion for centralized dealings is the implementation of straight-through processing and leading technology platforms, including OMS, EMS and TCA. Asset managers with a significant need for trading data and analysis would benefit most.

LOW-TOUCH, MID-TOUCH AND HIGH-TOUCH: REDEFINING ORDER TYPES IN A MULTI-ASSET FRAMEWORK

Centralized trading allows asset managers to rethink the way that that they segment orders, beyond instrument and asset class type. They can define the order within a cross-asset framework considering the complexity of the investment and the characteristics and needs of the trade.

Let us compare the trading characteristics of an illiquid small-cap Canadian equity stock, Richards Packaging, to a small order of Visa or a high-yield corporate bond. To trade Richards Packaging, the

trader sees that there are no indications of interest from the brokers or buy side, in addition to virtually no lit or dark liquidity. The trader then determines which broker traded the stock over the previous month and decides if quizzing them is worth the trade-off of information leakage. An alternative is to rest a hidden order in an anonymous crossing network and wait for a new indication of interest. Does this example sound more like trading a small order of Visa, or a high-yield corporate bond?

The same parallels can be made between electronic trading of foreign exchange and equities, and the request for quotes (RFQ) and request for market (RFM) processes for government bonds, **WMR FX trades** and OTC derivatives trades. **Trading skills are transferable, and cross-asset.** By leveraging the skills of traders – to use technology, source liquidity, manage information leakage, and understand data and markets – firms can create efficient and more effective front-office processes, with the potential to add more value to the trade. Automation frees up time and the buy-side trader's role changes in focus from operational to advisory.

Order Types in a Cross-asset, Centralized Trading Framework

Low-touch: These are orders to which traders take an oversight role as little or no manual intervention is required. They may or may not be time sensitive, but they must be liquid, and are typically smaller, with a relatively small and stable spread. Traders can complete these orders in the context of the quote or work them in over a short period. Rules-based automation of these orders through a leading OMS and EMS frees up traders' time for mid-touch and high-touch orders.

Mid-touch: These are orders to which skilled traders can add value. They are often more time sensitive (requiring immediate or same-day execution). They may be larger, have medium liquidity and require some skill in handling. These orders may require skill in sourcing liquidity from all available venues and sources, management of information leakage, decision-making on strategy implementation, and monitoring the progress of the trade.

High-touch: These are orders to which traders can add significant value, at the same time the cost of a poorly executed trade or missed liquidity could be high. They are often less time sensitive (requiring same-day execution, or several days). They may be larger, illiquid orders, such as a small-cap equity order or a corporate bond that has not traded in several months. Complex, multi-asset transactions and derivatives are "high-touch" as well as transition management trades.

This new framework is not ideal for all firms as segmenting orders into low-, mid- and high-touch categories is not always possible. For example, firms with homogeneous orders or few cross-asset strategies would not benefit as much from redefining order types. Asset managers must have leading technology and sufficient in-house trading volumes to warrant having trading expertise divided on a centralized desk. Each firm should review its unique circumstances and trading needs before migrating to centralized dealings.

The graph below is an example of how an asset management firm with centralized dealings might categorize different order types as low-touch (red box), mid-touch (blue box) and high-touch (orange box). **The ability to segment orders by their characteristics, including "low-touch", "mid-touch", and "high-touch" is a key success criterion for centralized dealings.**

CATEGORIZATION OF ORDER TYPES

CHAPTER KEY TAKE-AWAYS

- Market developments and changes in firms' strategies have pushed centralized trading forward over the past 30 years, and even more intensely in the last decade.
- We have seen a proliferation in cross-asset investment strategies among retail and institutional investors, and institutional investors are increasingly bringing assets in-house to reduce costs and drive alpha creation.
- The buy side is demanding more centrally managed data, as traders analyse and optimize trades on a cross-asset basis and build out the foundations for machine learning.
- Regulators are forcing greater transparency at the exchange and broker-dealer levels, making electronic trading and trade automation increasingly viable.
- With evolving market structures and cross-asset demands the following trends are emerging:
    - Development of cross-asset and/ or asset allocation strategies
    - Management of substantial assets in-house
    - Investment in leading technology, and advanced data and analytics
    - Segmentation of order types by trading characteristics

WHY ARE SOME FIRMS STILL TRADING IN ASSET CLASS SILOS?

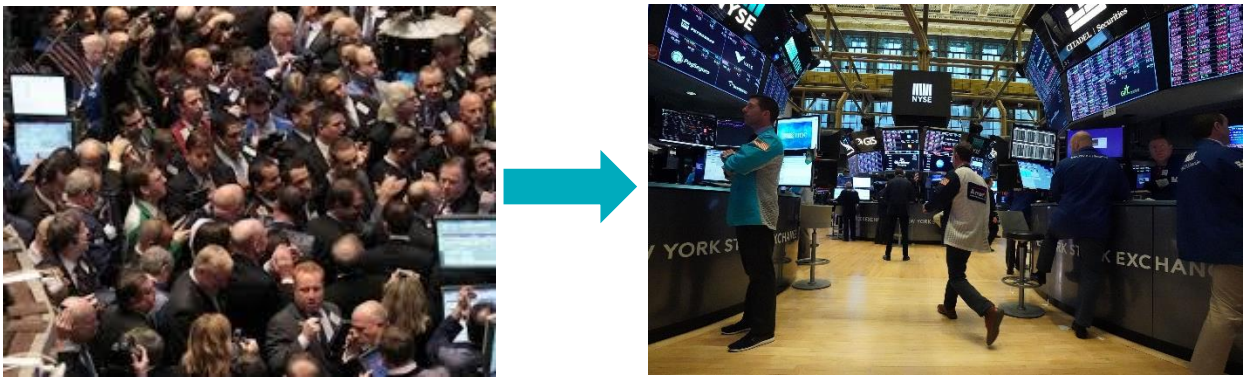
Centralized dealings are not necessarily an ideal solution for small asset managers, given the upfront costs in technology and personnel. Firms with simple order types and strategies will not benefit as much. Small firms might consider outsourcing to benefit in part from centralized dealings. We analyse the costs of centralized trading in a subsequent section titled, ***Estimating the Annual Net Benefit of Centralized Trading***.

See the KEY CRITERIA CHECKLIST for Market Structure and Cross-Asset Considerations best practices.

EVOLVING DESK STRUCTURES AND CASE STUDIES IN CENTRALIZED DEALINGS

The size and structure of trading desks have been dramatically impacted by a confluence of broad-reaching trends, including globalization, improvements in technology, shifting investment needs, and cost pressure.

Innovations in technology have enabled 24-hour global trading capabilities with significantly fewer trading staff. Perhaps one of the most dramatic ways to see this shift is to look at the impact of technology on the New York Stock Exchange (NYSE)[46]. The NYSE trading floor was known to hold over 5000 traders in the early 1900s when all transactions were done on paper. In the 1980s, **SWIFT** messaging developed to ensure a secure way to send payment and secure messages. In the 1990s, the Financial Information eXchange (FIX) protocol replaced phone communication, enabling firms to send and receive real-time transactions with their counterparties globally. Because of these advances in technology, the exchange significantly reduced the number of specialists to about 420[47], each of whom were required to make a market in only one or two securities. Today, the floor is almost empty thanks to electronic trading– a small number of **designated market makers** remain, each with a basket of assigned securities that they make two-sided markets in at all times.[48]



Secure, electronic messaging and payments to global counterparties sparked a strategic shift in the way the trading industry viewed their operations and desk structures. In the 1980s and 1990s a firm's location and "having boots on the ground" globally was a competitive advantage. In the 2000s the focus moved to growing market share, which kept desk sizes at banks relatively large despite advances in technology. The largest US and European banks increased their scope, as regulators liberally allowed banks to use leverage and balance sheets to warehouse positions for proprietary trading, including market making and securitization activities. Return on equity (ROE) from trading and processing business lines was high during this period at approximately 21 per cent in 2005-07, a significant

[46] Adapted from SIFMA. (2019). *SIFMA Insights. Electronic Trading Market Structure Primer.* **https://www.sifma.org/wp-content/uploads/2019/10/SIFMA-Insights-Electronic-Trading-Market-Structure-Primer.pdf**

[47] Ibid. p. 29.

[48] Source for pictures: Getty Images (LHS) marketplace.org (RHS)

contributor to the typical firm-wide range of 10-15 per cent during the same period, as cited in a study done by the Bank for International Settlements.[49]

However, the 2008-09 financial crisis put an end to excesses, and firms refocused on technology and restructuring to increase efficiencies and cut costs. Major global banks shifted their businesses away from trading and more complex strategies, toward more profitable areas that were less capital intensive[50]. This was due in part to increased regulatory oversight, which decreased the amount of leverage available to banks, increased costs, and allowed for non-bank competition with less stringent capital requirements to gain market share.[51] Further, legal costs associated with misconduct and related litigation were a headwind for many major financial institutions, due to high-profile cases like the LIBOR fixing scandal.

The move to remote work during Covid-19, put further pressure on banks to reduce excesses and streamline operations. The spotlight on any remaining cost inefficiencies caused banks globally to adapt, leverage technology and further centralize dealings.

EVOLVING DESK STRUCTURES

- **Large banks have shifted their business models to centralized trading, amid the trends and cost pressures discussed above, and the evolving needs of the buy side.** Historically, banks had much larger teams, dispersed based on geography, department, job function and product. The diagram below is an example of the generic structure of a sales and trading division.[52] The arrows give a sense of the number of dispersed sales and trading relationships between one buy-side firm and one sell-side firm. Roles were very narrowly defined and specialized. For example, in Canada, it was common for a large bank to have a team of Canadian equity energy proprietary traders with each specialized in a different segment of market capitalization.

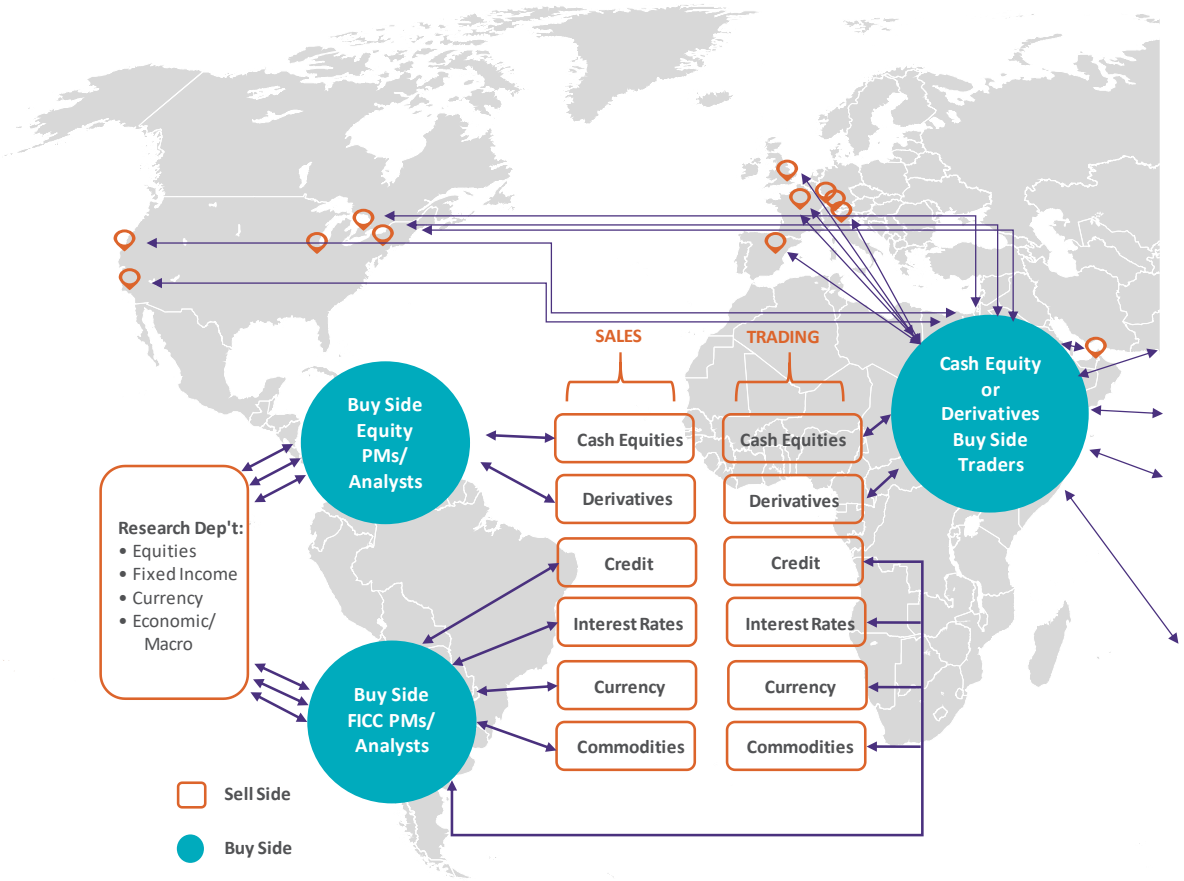
[49] Sources: Roengpitya et al (2017); Fitch Connect; national data. Structural Changes in Banking after the Crisis. Pg. 27. **https://www.bis.org/publ/cgfs60.pdf**

[50] Buch, C. & Dages, B.G. chaired the Working Group established by the Committee on the Global Financial System. (2018). *Structural Changes in Banking after the Crisis.* **https://www.bis.org/publ/cgfs60.pdf**

[51] Ibid. p. 61.

[52] SIFMA. (2019). *SIFMA Insights. Electronic Trading Market Structure Primer.* **https://www.sifma.org/wp-content/uploads/2019/10/SIFMA-Insights-Electronic-Trading-Market-Structure-Primer.pdf**

Legacy, Dispersed Sales & Trading Structure

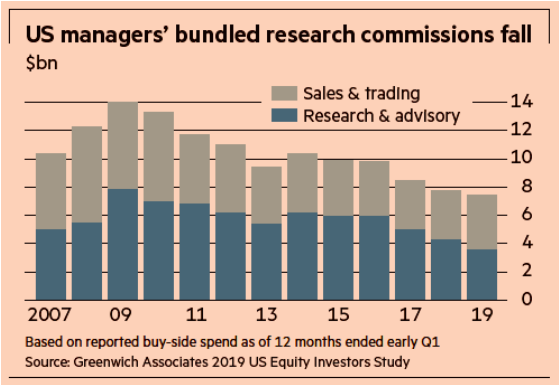


Following the 2008-09 global financial crisis, banks have continually announced restructuring plans. In 2019, Deutsche Bank announced plans to exit its global equity sales and trading business and cut 18,000 jobs (roughly 20 per cent of staff). Citigroup cut hundreds of trading-related professionals by merging its equities business with its prime, futures and securities services unit, and merging its foreign exchange and rates businesses. In February 2020, HSBC announced cuts of around 35,000 jobs (roughly 15 per cent of staff) over the following three years. Once dubbed "the world's local bank", HSBC has moved away from its globalization strategy as the costs were too great. It first exited some emerging markets in 2011 and is now focusing on its most profitable areas in Asia and pulling back in the US and Europe.

Banks are shifting their business models to focus on changing buy-side client needs, amid technological advances. They are downsizing and restructuring, generally focusing on reducing exposure to capital markets activities like trading and market making; exiting regions and business lines that are not profitable; and "juniorizing" staff by removing middle management and replacing them with younger, less expensive employees. Banks are systematically reducing the scope and scale of their fixed income trading areas because trading revenues and ROE have

declined amid tighter balance sheet requirements from regulators.[53] With leaner teams in place, banks are generally pursuing one or both of the following two client service strategies:

1. **High volume, standardized service.** Banks have heavily invested in technology, fintech, and personnel to build out trading infrastructures. However, since the 2008-09 financial crisis, commission rates have been in steady decline, as shown in the chart [below/to the right] (right[54]). For example, online brokerage firm Robinhood is pushing into new territory offering zero-commission trading. Some larger firms are choosing to maintain their trading businesses because variable costs are low now that the infrastructure is in place. They are motivated to maintain volumes and grow market share at any price (even paying for flow), focusing on low-cost efficient execution to feed centralized risk books. From a service perspective, buy-side traders note a more streamlined model in which they typically deal with one sales trader for multiple products, asset classes and regions. Global electronic trading is integrated and cross-asset.



2. **Tailored service.** Banks are increasing interactions with key buy-side staff, creating tailored solutions. Their investments in large-scale platforms allow buy-side clients to scale and optimize costs. Again, the strategy of the banks mirrors the needs of the clients. The automation of trading in standardized products frees up the time of key individuals to design tailored solutions for buy-side clients. These may include bespoke OTC derivatives, structured products or cross-asset solutions to meet investors' needs. The relationship is typically one-to-one, with one cross-asset sales trader to one centralized trader/ dealing desk (below left).

[53] Ibid. p. 60.

[54] Siobhan Riding, Financial Times (2019), *US managers' bundles research commissions fall,* ***https://www.ft.com/content/40477f19-fffb-3d30-bfbd-4134bb31f416****,* and Greenwich Associates (2019), *Greenwich Associates 2019 US Equity Investors Study*

Centralized Trading and a Tailored Service Stucture

- **Large Canadian pensions have had a delayed evolution in centralizing their trading, relative to the banks, but they are moving in the same direction, seeking efficiencies, and building expertise in complex trading strategies.**

  Some of the key drivers of these changes include the following:

  (1) **technology innovations and trade automation** which permit multi-asset trading and analysis through centralized OMS, EMS and TCA tools, and open the door to advisory, value-add trading;
  (2) **increased regulatory and client requirements** for transparency, centralized controls and compliance;
  (3) **expectations of a lower return environment going forward**, contributing to increased scrutiny over costs and commission management, and driving the need for geographic and asset-class diversification, cross-asset strategies, and internalization of asset management; and
  (4) **growth in assets** is driving the need for scalability.

  Buy-side traders at large pension funds are increasingly trading multiple instrument types and assets. As the number of traders decreases and desks are centralized, firms are cross-training to minimize key person risk and increase trading skills.

  The pace of change among pension funds differs. We interviewed senior operations and trading staff at four global institutional asset managers.

  The interviewees mentioned the following key reasons for the move to centralized dealings:

  (1) centralized relationship and commission management;
  (2) vocational specialization among front-line staff;
  (3) segregation of duties for compliance purposes;
  (4) cost savings;
  (5) scalability for growth;
  (6) growth of cross-asset strategies and internalization of asset management;

(7) mitigation of errors, operational and reputational risks; and
(8) new cross-asset technology, including OMS and TCA platforms.

While all agreed on the merits of centralized trading, **a reluctance to change from decentralized trading was present in select areas, often related to a lack of confidence in the transition period to centralized dealings.** As a result, transition plans were usually phased in and involved coordination between portfolio managers and traders. Endorsement from senior leadership was often the catalyst needed to move forward. Other catalysts included a change in OMS, which required new processes, and a change in investment strategies/ management.

- **Large and mid-sized global mutual funds, insurance funds and multi-asset boutiques** often have somewhat decentralized dealings**.** Their open architecture structure means they can offer clients in-house and externally managed products as a "one-stop-shop" for their investment needs. They often have offices around the world and operate with distinct profit and loss centres. Multi-asset boutiques acquire fund management firms or their teams, or they hire outside firms as affiliates, under the agreement that they will run their costs independently. This structure inherently poses a challenge to centralized dealing. However, there is a compelling case for regional centralized dealings to maintain a local presence when portfolio managers are located globally.

  Alternatively, if it is not possible to share a centralized trading desk, firms need to assess the benefits and costs of centralized trading versus outsourcing. This is usually the case with affiliates in a multi-asset boutique, similar to a smaller investment firm. We discuss smaller investment managers below.

- **Smaller investment managers are increasingly looking to outsource trading to access some of the benefits of centralized dealings at a reduced cost.** Asset managers who outsource some portion of their trading are most often smaller investment managers. Cost containment is the main reason for outsourcing.

  Smaller investment managers are seeing their assets under management drop as global asset managers bring assets in house, and retail investors continue to increase their exposure to ETFs and passive strategies. Lower expected returns, underperformance, and competition are causing downward fee pressure (lower revenue). In some areas, operating costs associated with running a trading desk are also rising. Specifically, regulatory requirements have led to increased costs in reporting to clients, managing the separation of execution and research payments, and documenting and tracking cross-asset best

> Each buy-side trader can handle about $1.5 billion of annual trading volume. For funds with turnover below that, outsourcing makes more sense, but for bigger ones, an in-house team has its perks.
>
> BNN Bloomberg

execution. Leading OMS and TCA platforms are too expensive if no economies of scale are present.

Through outsourcing, small asset management firms can access some of the regulatory and technology benefits of a centralized trading desk, at a lower cost, including the following:

- Minimum standards for best execution and assistance with reporting requirements;
- Segregation of duties;
- Management of commission payment accounts;
- Access to TCA platforms;
- Access to broker liquidity only available with sufficient volumes; and
- Scalability for growth.

Arguably, the biggest loss in outsourcing is the potential for misalignment of client interests in executing orders. No external trading firm could better understand the rationale for the trade, than the asset management firm itself. In addition, firms that outsource cannot access other benefits of centralized trading, including the following:

- Cross-asset monitoring of portfolio positions and exposures by senior management;
- Comprehensive oversight in controls;
- Centralized trading data management and cross-asset insights;
- Collaboration among teams in a trading area;
- One voice to influence broker partners on ESG issues and service levels;
- One voice to negotiate commission payments with broker partners;
- Tailored solutions in algorithms, liquidity sources, TCA and trader advice; and
- True client-centric, cross-asset best execution.

In addition to the above, firms that outsource cannot delegate all trading requirements, such as compliance pre-trade controls and fair and equitable trade allocation methods. While outsourcing is increasing in popularity among smaller firms to combat rising costs and decreasing revenues, it has serious shortcomings versus in-house centralized dealing for a large asset manager.

ALTERNATIVE PERSPECTIVES

The following shares four case studies from asset managers who have implemented centralized trading structure. Each organization had their own unique needs and historical structures, which informed their transition to centralized trading. However, common benefits, such as efficiency gains and greater controls are seen across all case studies.

Case Study #1: Evolving Strategy and Operations

The firm has a long history of trading and evolving to add new strategies. For example, absolute return strategies have long formed a core holding in the portfolio, and this asset manager now uses a risk budgeting approach to asset allocation, and asset overlays to assist with tactical decisions.

Centralized trading was both a strategic and operational decision. In implementing their strategy, this asset manager centralized their broker relationship oversight to increase accountability. They wanted one voice in negotiating commission savings and needed deeper cross-asset transaction cost analysis to support firm-wide broker performance measurements, and to ensure best execution, specifically, that the value of research that they received equalled the spend.

From an operational perspective, trading was fragmented throughout the firm. Futures contracts, for example, were traded by many portfolio managers throughout the firm. Foreign exchange was traded in public markets, private markets, treasury operations and corporate finance. The only areas that had been centralized for many years were equities and options.

Not surprisingly, their systems were fragmented as well. They had three separate OMS whose system limitations and decentralized trading created regulatory risks for the firm.

> ***"The portfolio managers were not doing pre-trade and post-trade transaction cost analysis for futures…***
>
> ***We didn't have sufficient compliance checks, leaving us exposed to the risk of breaching position limits at the exchange…***
>
> ***Cross trades were happening with no/ limited netting internally."***
>
> ***~ Senior Operations Individual***

This fund manager was exposed to operational and reputational risks, and they needed to upgrade their OMS. They decided the first steps was to centralize their processes, as updating processes after implementing a firm-wide OMS system would have been more expensive due to the cost of migrating workflows and bespoke processes. At the same time, they knew that the integration with their investment book of records would take time. Therefore, they staged centralized dealings in three phases: (1) futures, (2) foreign exchange, and (3) remaining derivatives and fixed income.

This fund manager decided to phase in centralized trading based on several metrics including the following:

- number of trades by instrument and asset class;
- respective potential for cost savings;
- degree of compliance concerns;
- degree of key person risk;
- the need for deeper cross-asset TCA; and
- the need to ensure best execution was being met.

The transition was not without challenges. Some of the portfolio managers were concerned about time to market and the level of understanding initially on the trading desk. To address these concerns at the outset, the traders worked closely with the portfolio managers who were given a short transition period in which they could continue to trade but needed to justify in writing why they did. Additionally, the firm hired new traders skilled in niche derivatives.

The firm's view is that the centralized trading desk is responsible for executing on a centralized trading strategy that allows for today's more sophisticated trading environment and increasing regulatory complexity. The desk oversees broker-partner relationships and manages commissions with one

centralized voice. The traders are efficient and highly skilled, and are cross-trained to mitigate key person risk and to benefit from multi-asset insights. Every trade in the firm, including the trades from the treasury group, flows through the centralized trading desk. The firm is almost always fully invested, as excess cash is swept centrally.

Case Study #2: Planning for Growth

This fund manager's story has been about planning for growth, including ensuring scalability in its trading, diversifying its investments, and bringing assets in-house. Formerly, the funds were invested entirely in nonmarketable government debt. Similar to Case Study #1, discussed above, over time, this manager diversified the fund's asset mix. In its early growth stage, they took a strategic shift to invest more actively and in alternative strategies across all asset classes, while internalizing asset management.

This manager's trading teams have traditionally had a somewhat decentralized approach, but controls and oversight have always been important. For at least the last decade, they have had segregation of duties in place between portfolio managers and traders, as well as back-office staff. Historically, there were two main trading teams, led by a different individual. One team was focused on collateral financing, and the other on the execution of orders for portfolio managers. Recently, the fund manager made the decision to merge the two desks under a single head trader.

This asset manager based their decision to centralize trading on the following:

- enable scalability as they grow;
- internalizing flow and assets;
- improving controls, including centralized oversight, avoiding key person risk and continued segregation of duties;
- breaking down asset class silos;
- improving execution quality and "having expertise in the right places"; and
- economies of scale and other operational efficiencies.

This asset manager now has one head trader, responsible for capital/ financing, execution, and off-market fixed income trading. In addition, they have a small stand-alone trading desk attached to the public markets credit team.

One of the biggest challenges faced by the fund manager with respect to centralization has been cross-training on their more sophisticated strategies. The traders have taken several years to build up sufficient expertise in this area to reduce key person risk. The public markets credit trading team was left decentralized, as the expertise for these trades lies in that department.

Moving toward centralized trading has enabled efficiencies. Like the firm in Case Study #1, this manager has multiple OMS, but will be looking to move to a single system in the future.

> ***"From an operational perspective, having a centralized trading desk is a huge help, a big bonus."***
>
> ***~ Senior Operations Individual***

Centralized trading also enables discretionary trading by the trading desk. **This framework encourages both the investment and trading teams to search for the best possible investment opportunities across asset classes and breaks down asset class silos.** The skill and expertise that can be developed through centralized dealings is apparent from the sophistication of the strategies that are run in-house at this asset manager.

Case Study #3: Building Efficiencies

This fund has been undergoing significant growth, as net inflows continue on the back of strong performance. **Scalability as they grow, internalization of assets and in-house management, have been strategic business priorities, and centralizing trading was a part of this shift.** The primary business need was to build efficiencies. Previously, portfolio managers with fixed income and foreign exchange holdings staged and executed their own orders, with no segregation of duties. Some foreign exchange trading was outsourced. Other than equities, trading was decentralized.

Senior management made a clear decision that they wanted to centralize all dealings, streamline processes, create efficiencies and enable portfolio managers to focus solely on the management of their funds.

> ***"Relationship management with broker dealers was spread too thin across the firm and portfolio managers. It was time consuming to keep on top of the relationships and to source liquidity. It made sense to concentrate these activities with a small number of traders…***
>
> ***The transition to centralized dealings was smooth. Initially, the portfolio managers could decide the level of delegation, such as which broker to use, but over time trust increased and traders had full discretion."***
>
> ***~ Manager/ Contingent Dealer***

This asset manager phased in centralized trading by asset class, first fixed income, and then foreign exchange. The trading team now resides in the newly created Capital Markets department, supporting the total fund. It is physically located in the middle of the asset classes, making it easy to share ideas. The department is responsible for the balance sheet as a whole, liquidity and exposure management including firm-wide strategic tilting, securities lending, and member cash flow management. Cross-asset trades benefit from centralized trading, such as collateral upgrade trades, securities lending, and hedging and tilting trades.

The trading team is very lean and efficient with one head trader, and three dedicated traders. There is complete segregation of front office duties. They also have two "contingent dealers", portfolio managers who are trained to step in and help for one or two days per month when there is significant flow related to member contributions.

The biggest challenges facing the trading team right now are key person risk (due to an extremely lean team) and very lumpy flow. Plans are currently in progress to hire another trader to help address these issues.

Case Study #4: Unifying International Operations

This asset manager's story has been one of growth and international expansion. As the firm opened offices around the world and established investment management teams, they hired small teams of

local traders with local processing units. With many years of international operations, they had extremely fragmented support and trading teams with entrenched processes. Breaking down legacy structures was a challenge. Within the last few years, they undertook a major project to consolidate their OMS environments globally. This required six migrations in three phases.

The rationale for the project was based on the following:

1. **Segregation of duties between portfolio managers and traders, and vocational specializations:** Portfolio managers in fixed income were still staging and executing their own orders. Senior management strongly believed that it was an inefficient use of portfolio managers' time to be sourcing liquidity. They wanted strict segregation of duties.

   "We used to have portfolio managers doing their own trading. It's inefficient. Portfolio managers shouldn't be spending time sourcing liquidity. Implementation should be specialized."

   ~ Senior Executive with oversight of Trading and Strategy Implementation

2. **Operational efficiencies, eliminating redundancies and cost reduction:** This manager standardized its trading workflow by region. For example, all U.S. flow entered in North American trading hours would flow to the U.S. desk for execution. All Canadian flow initiated in the U.S., would flow to Canada.

   A global trade support team was set up for matching and settlements of equities and fixed income securities, in addition to a global trade support team for derivatives and foreign exchange. These changes reduced the need for operations support personnel.

3. **Flexibility and key person risk:** Consolidation of the OMS enabled a 24/7 trading cycle. Traders could see every order that hit the blotter globally, enabling better cross-training and coverage.

4. **Scalability:** Global trade allocation policies were implemented, and time was spent to make sure that compliance controls were in line with their documentation. Following these changes, the firm was better positioned for continued growth.

This asset manager left one team decentralized, the LDI and Indexing team. The cross-asset strategies that this team manages would not be possible to trade with asset-class specific traders under this manager's current structure.

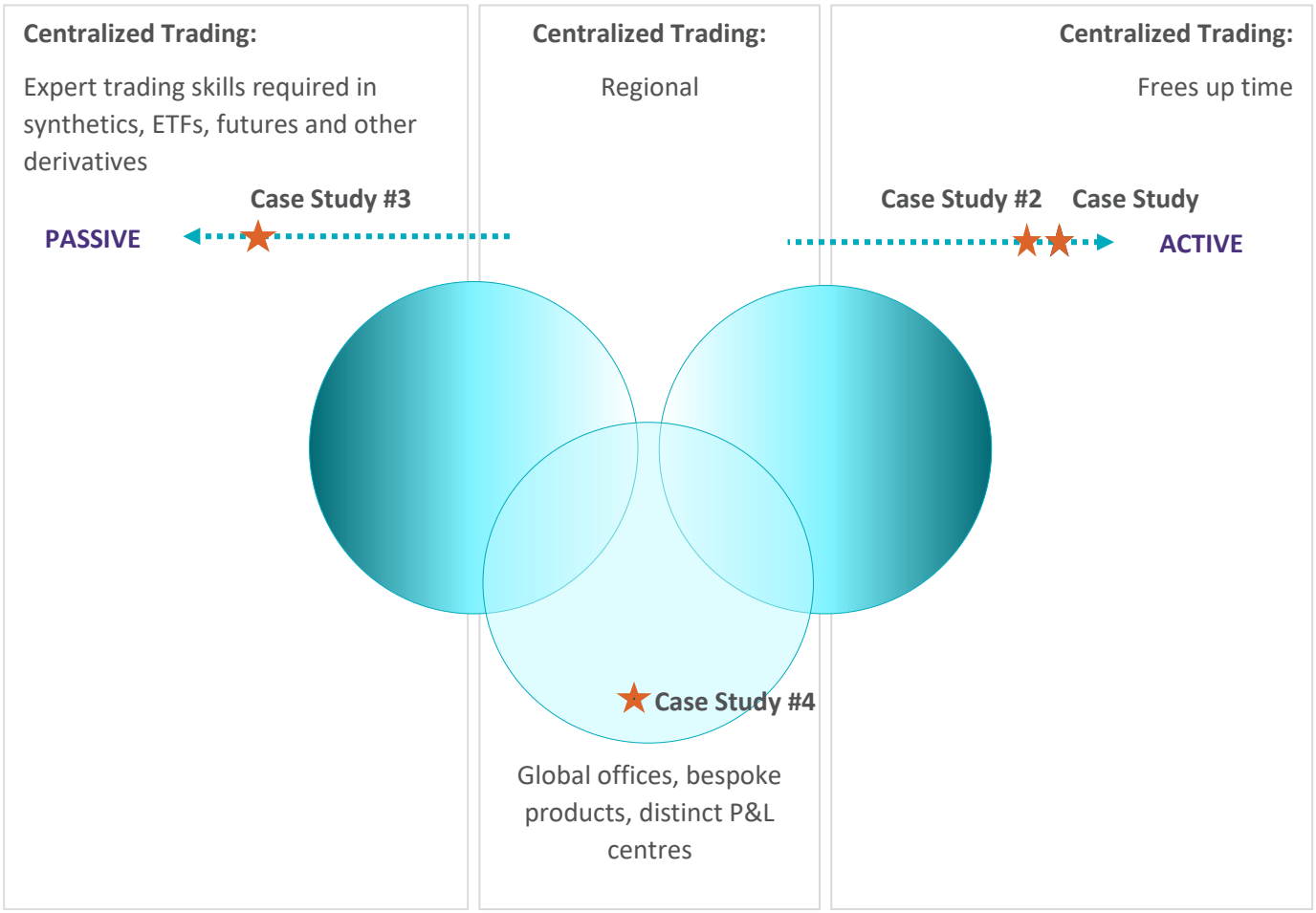
"With fixed income trades, in particular, there is a lot of discussion between the portfolio managers and traders. Having the traders located in the regions helps with communication, especially during volatile periods."

~ Senior Executive with oversight of Trading and Strategy Implementation

The trading and support areas currently find tracking commissions on a global scale a challenge, (particularly for futures trades) as well as demonstrating and tracking best execution across the firm.

Mid and large-sized global asset management firms with a variety of strategies benefit from centralization.

In the diagram below plots the firms discussed in the case studies. All the firms have the size, volume and trading expertise to warrant centralized dealings. Case Study #1 and Case Study #2 have highly active strategies that they employ at the total fund and individual fund levels. Case Study #3 has a very lean and efficient trading structure but is also versatile and nimble in its use of derivative instruments to gain different exposures. In our view, now that Case Study #4 has taken the key step to centralize its operations globally, the firm could benefit from regional trading hubs as the next step in centralizing its dealings.



CHAPTER KEY TAKE-AWAYS

- Broad trends in trading point to the need for greater efficiencies, and the ability to execute higher volumes and complex trades with fewer staff. To-date, large banks have taken the lead in streamlining their trading teams, and asset management firms are following suit.
- There are clear benefits for virtually all large, global asset management firms to implementing centralized dealings, but some will benefit more than others will.
- A key success criterion for centralized trading is the presence of one of the following organizational structures:
    - The firm is a mid or large-sized global asset manager that engages predominately in active cross-asset strategies.
    - The firm is a mid or large-sized global asset manager that engages predominately in passive cross-asset strategies.
- The benefits of centralized dealings are ***non-linear***. Therefore, firms that choose partial centralization should expect to see a much lower benefit. We discuss the unique considerations of a firm and how to assess these in more detail in the section on ***Estimating the Annual Net Benefit of Centralized Trading***

Organizations with Unique Circumstances

Not all firms have the organizational structures discussed above, and others have unique constraints that limit their ability to fully implement centralized dealings. You may be asking yourself the following questions:

Can a small asset manager with single-asset or standardized flow benefit from centralization?

- Yes, they would benefit from many of the aspects of centralized dealing. Unfortunately, many small firms will need to forgo these benefits and choose outsourcing as a lower-cost solution to gain access to essential trading, regulatory and compliance requirements.

Are there benefits to partial centralization?

- Yes, if the firm is a mid or large-sized global mutual fund, insurance fund or multi-asset boutique with a global footprint, there is a compelling case for regional centralized dealings to maintain a local presence. These global dealers often have offices and portfolio managers located around the world. This type of organization would benefit from back-office centralization and creating regional hubs.
- Yes, if the firm is not ready to embrace the centralization of fixed income trading. In this case, One Wallet and One Voice may be tacked on to an otherwise centralized trading desk so that firms may benefits from fair price negotiations. However, controls, oversight, and cross-asset insights would all be limited in scope.

See the KEY CRITERIA CHECKLIST for Alternative Desk Structure Considerations best practices.

IMPLEMENTATION FACILITATED BY TECHNOLOGY

Asset management firms with the size, business requirements and strategy to warrant centralized dealings must review the current state of their trading and support systems. Technology plays a critical role on all trading desks. Outdated and fragmented OMS do not allow a firm to benefit fully from centralized trading. Conversely, if a firm implements a leading OMS without centralizing their trading processes, it may not recuperate its investment in the OMS through cost savings and other synergies.

"What comes first, the OMS implementation or centralized dealing processes?" We asked a large Canadian pension fund that question.

> ***"When we decided to implement centralized dealing, we looked at many metrics, including potential cost savings, the absolute number of trades, netting of internal transactions, lack of sufficient compliance controls, the potential for deeper TCA analysis, the ability to negotiate better commissions through broker "scorecarding", and ensuring the value we received from brokers was equal to the spend. At the same time, we needed a new OMS and we knew that integration would take time. It was clear to us that implementing centralized processes and trading first was the more efficient approach. If not, we would've needed to redo a lot of bespoke processes."***
>
> ***~ Senior Operations Individual***

The OMS, with fully integrated EMS and a cross-asset TCA platform, is the largest investment a firm will make to implement centralized dealings. We recommend that asset managers centralize their processes ahead of their systems implementation, to the extent possible, in order to reduce unnecessary implementation costs.

WHAT SYSTEMS ARE NEEDED FOR CENTRALIZED TRADING?

There are **three essential trading software and hardware systems:**

1. **The OMS (Order Management System)** provides portfolio managers with cross-asset, real-time views of their portfolios, and allows them to generate orders.
2. **EMS (Execution Management Systems)** provide access to market data and trading venues and are where traders typically route orders from for execution.
3. **TCA (Transaction Cost Analysis) tools** provide feedback to traders, compliance officers and management to monitor best execution on a cross-asset basis.

WHAT ARE THE BENEFITS FROM TECHNOLOGY?

Asset managers are at different stages in their transition to centralized dealings. From a technology perspective, they may observe the issues highlighted below under the "Current State" to varying degrees. When firms realign organizational structures to centralize their trading, and implement a

leading cross-asset OMS, integrated with EMSs and TCA platforms, they can resolve these issues and reap the benefits of the “Potential Future State”.

The current state of many asset management firms includes an outdated OMS, which can cause challenges in a centralized trading environment. Fragmented trading is often present.

Portfolio managers cannot model and stage trades reliably within their OMS, nor do they trust the EMS and OMS to send back fills reliably in real time. Therefore, bespoke processes and other workarounds are common, including the use of in-house systems, disparate portfolio management systems and spreadsheets. Issues in routing can cause delays, leading to missed opportunities. Compliance rules and checks are often limited, and not necessarily applied on a cross-asset basis.

Processes and oversight include non-standardized dealing procedures and different interpretations of best execution. Firms segment trades solely by their asset class, and generally do not benefit from any broader market data or insights or sharing of trading information among teams. Front office and back-office redundancies are present. Without one system to manage costs, relationships are dispersed throughout the firm and clients may unfairly overpay for lower service levels.

A key success criterion for centralized trading is to implement a leading cross-asset order management system, integrated with execution management systems and transaction cost analysis platforms. Leading technology enables the benefits of the "Potential Future State" including cost savings and new investment insights.

THE LIFE CYCLE OF A TRADE IN CENTRALIZED DEALINGS

While a holistic review of each process is outside the scope of this paper, below we outline the life cycle of a trade in the "Potential Future State" in which a leading cross-asset OMS is implemented and fully integrated with EMS and TCA platforms. Organizational structures are realigned to create one workflow and centralize trading. We discuss some of the more impactful process changes that an asset management firm might expect.

- **STEP 1: PORTFOLIO MANAGER STAGES ORDERS & COMPLIANCE CHECKS RUN**

  In the future state, a portfolio manager has real-time views of the holdings to model and analyse trades. The portfolio manager stages the orders in the OMS and sends them electronically to the trading desk. Firm-wide, harmonized, compliance and tolerance rules check for criteria such as client policy restrictions, suspicious trading, market manipulation, conflicts of interest, and deviations from best execution. The compliance checks, automated by the OMS, may reject orders, or require an override and explanation from the portfolio manager/ senior manager. After this screen, the orders flow through in real-time to the centralized trading desk. Throughout the life of the order, the portfolio manager can view the fills in real time.

- **STEP 2: AUTOMATION OF "LOW-TOUCH" ORDERS**

  A centralized dealing framework can benefit from a high level of automation. A leading OMS integrated with an EMS, can facilitate the automation of "low-touch" orders, freeing up traders' time to handle orders that generate more alpha.

  After the portfolio manager stages the orders in the OMS, compliance checks run, and the orders flow through to the EMS. The EMS then applies rules built by the centralized trading desk to determine if the orders are eligible for automation. The EMS automatically executes the trades that meet the characteristics of "low-touch" using pre-defined parameters for cross-asset best execution. For example, the automation of an equity order may be determined based on the account and the liquidity profile of the trade (e.g., percent of average daily volume, current spread, and sufficient depth in the centralized order book). Trading rules would determine a dealer and algorithmic strategy. In the case of an automated bond trade, traders would codify rules that select a dealer using a multi-dealer request for quote (RFQ). For example, the logic would need to account for real-time dealer pricing, firm quotes, any taxes, and a maximum bid-ask spread relative to historical trades.

Traders do not manually handle automated orders, but they are able to monitor them in real time and suspend or modify the execution using a dashboard. The automation may also suggest an action, so that the trader can control the final click to trade. The broker/ trading venue sends back trade fill information to the EMSs and OMS in real time. **The automation of select orders removes execution latency and codifies best execution requirements, reducing operational risks and errors as a result.**

To automate orders, firms should define a "low-touch" set of orders, based on trading characteristics, not investment characteristics (the default approach when firms use disparate, asset-class specific trading systems). For example, firms often classify bond and money market trades by time horizon, credit rating, and country of origin. These characteristics alone do not describe the needs of the trade, and they do not tell you if an order can be automated. As we discussed in the ***Market Structure and Cross-Asset Considerations*** section, an illiquid small cap stock trade is more similar to a corporate high-yield bond trade, than it is to a small Visa order. The small Visa order is the only likely candidate for automated execution.

We define "low-touch" orders as follows:

> *Orders to which traders take an oversight role as little or no manual intervention is required. They may or may not be time sensitive, but they must be liquid, and are typically smaller, with a relatively small and stable spread. They can be traded in the context of the quote or worked in over a short period.*

ORDER CHARACTERISTICS

- ✓ **Small size**: Relative to other trades in the same financial instrument;
- ✓ **Low cost**: Narrow bid-ask spread in absolute terms and relative to historical;
- ✓ **Highly liquid**: Deep depth of book;
- ✓ **Standardized pricing methods**; and
- ✓ **Low risk of information leakage**.

TRADING PROTOCOLS

- ✓ Consolidated Limit Order Books (CLOBs);
- ✓ Algorithms;
- ✓ Smart Order Routers (SORs); and
- ✓ Request for Quotes, Spreads or Markets.

Trades cannot be automated based on instrument type alone. Even a liquid instrument may require a trader to handle it if, for example, it is large relative to similar trades, implied volatility is elevated, or the bid-ask spread is wider than expected. However, some candidates for automation under normal market conditions, include algorithmic trades, liquid closing equity baskets, and government of Canada bonds.

The trading desk monitors the rules for routing orders for "low-touch" automation in real time, and uses feedback from transaction cost analysis. They evaluate executions, costs, venues, protocols and broker performance, and make adjustments over time.

- **STEP 3: "MID-TOUCH" ORDERS**

Automation of "low-touch" orders through a leading OMS frees up traders' time for "mid-touch" and "high-touch" orders. Traders can specialize in "mid-touch" or "high-touch" orders. When the portfolio manager's trades arrive on the blotter, the appropriate individual picks up the orders.

We define "mid-touch" orders as follows:

> *Orders to which skilled traders can add value. They are often more time sensitive (requiring immediate or same-day execution). They may be larger, have medium liquidity and require some skill in handling.*

ORDER CHARACTERISTICS

- ✓ **Medium size:** Relative to other trades in the same financial instrument;
- ✓ **Medium cost:** Medium bid-ask spread in absolute terms and relative to historical;
- ✓ **Medium liquidity:** Sourcing liquidity from multiple venues required;
- ✓ **Standardized pricing/ methodology;** and
- ✓ **Medium risk of information leakage**.

TRADING PROTOCOLS

- ✓ Consolidated Limit Order Books (CLOBs);
- ✓ Algorithms;
- ✓ Smart Order Routers (SORs);
- ✓ Request for Quotes, Spreads or Mkts;
- ✓ Indications of Interest/ Executable Quotes;
- ✓ Crossing Networks;
- ✓ Exchange for Physical (via ETFs); and
- ✓ Anonymous Markets (e.g., Dark, Client-to-Client (C2C), All-to-All (A2A)).

"Mid-touch" orders are not homogeneous in nature. They are often characterized by lower levels of liquidity, requiring skill in sourcing liquidity and managing information leakage. Quantitative portfolios require decision making on strategy implementation, and ongoing monitoring of the progress of the trade to the desired outcome. Skill in the execution of "mid-

touch" orders comes through repetition and systematic, methodical processes. A centralized dealing desk provides the best opportunity for a trader to gain breadth and depth of skill in trading "mid-touch" orders.

- **STEP 4: "HIGH-TOUCH" ORDERS**

  The most experienced traders will usually pick up "high-touch" orders when they arrive on the blotter.

  We define "high-touch" orders as follows:

  > *Orders to which traders can add significant value, at the same time the cost of a poorly executed trade or missed liquidity could be high. They are often less time sensitive (requiring same-day execution, or several days). They may be larger, illiquid, complex, derivative, multi-asset, bespoke and/or transition management trades.*

ORDER CHARACTERISTICS

- ✓ **Large size:** Relative to other trades in the same financial instrument;
- ✓ **Large potential cost:** Medium bid-ask spread in absolute terms and relative to historical;
- ✓ **Low liquidity:** Sourcing liquidity from multiple venues required;
- ✓ **Bespoke or over-the-counter pricing/ methodology;** and
- ✓ **Significant risk of information leakage**.

TRADING PROTOCOLS

- ✓ Consolidated Limit Order Books (CLOBs);
- ✓ Algorithms;
- ✓ Smart Order Routers (SORs) to multiple CLOBs;
- ✓ Request for Quotes, Spreads or Markets (RFQs, RFSs, or RFMs);
- ✓ Indications of Interest/ Executable Quotes;
- ✓ Crossing Networks;
- ✓ Exchange for Physical (via ETFs);
- ✓ Anonymous Markets (e.g., Dark, Client-to-Client (C2C), All-to-All (A2A)); and
- ✓ Over-the-Counter (OTC) / Bespoke Negotiations.

"High-touch" orders vary in the way they trade. However, they are characteristically very illiquid, such as a small-cap, equity order that is over 20x the average day's trading volume, or a high-yield bond that has no indicated interest. Transactions are often over-the-counter and bespoke, and require several days or weeks to negotiate. Some trades may involve extremely large values, such as an asset allocation trade, or they may require significant analysis and planning, as in a manager transition. Derivatives, hybrid securities, multi-asset switches and spread trades are all "high-touch" orders. Traders who handle these orders need significant cross-asset

experience and expertise from a centralized dealing desk. If mishandled, the result could be very costly to the client.

- **STEP 5: CROSS-ASSET BEST EXECUTION AND TRANSACTION COST ANALYSIS**

Further to the discussion in the ***Regulatory Requirements*** section, the rules of the FCA and MiFID II require investment firms to send information on their best execution policy to clients, showing the reasonable steps they take to achieve the best possible result for clients across liquid asset classes, including foreign exchange and fixed income. Nevertheless, as shown in a recent survey by Greenwich Associates, despite this change, not all asset managers are doing TCA analysis to demonstrate best execution. We expect this to change going forward, and that more firms will implement cross-asset best execution frameworks and leverage the analysis and best execution frameworks currently being used on the equities side of the business.

> 88% of buy-side equities traders use TCA compared to 60% in FX and just 38% of fixed income desks
>
> ~ 2019 Greenwich Associates

Asset managers have a fiduciary obligation to seek best execution for clients at the portfolio level. They need to understand the full context of the trade to achieve the best possible results for clients. Cross-asset insights are increasingly important, including market conditions, correlations, volatility and alternative liquidity sources, such as ETF liquidity and synthetic instruments.

Regulators assess the process that a firm uses in executing its orders in determining best execution.. The chart below provides an example of some of the considerations in cross-asset best execution. The steps in the process including the following:

(1) Compliance rules. These are codified in the OMS and include things like checks for adherence to client and pooled/ mutual fund policies, and regulatory rules. Another example is a check for conflicts of interest, such as when a portfolio manager trades excessively with a single broker. A leading OMS allows for automation of many compliance controls.

(2) Context. Traders must understand the full context of the trade to ensure the best possible result for clients. This includes the rationale for the trade, the impact on client portfolios, and all parts of the trade, regardless of the asset class.

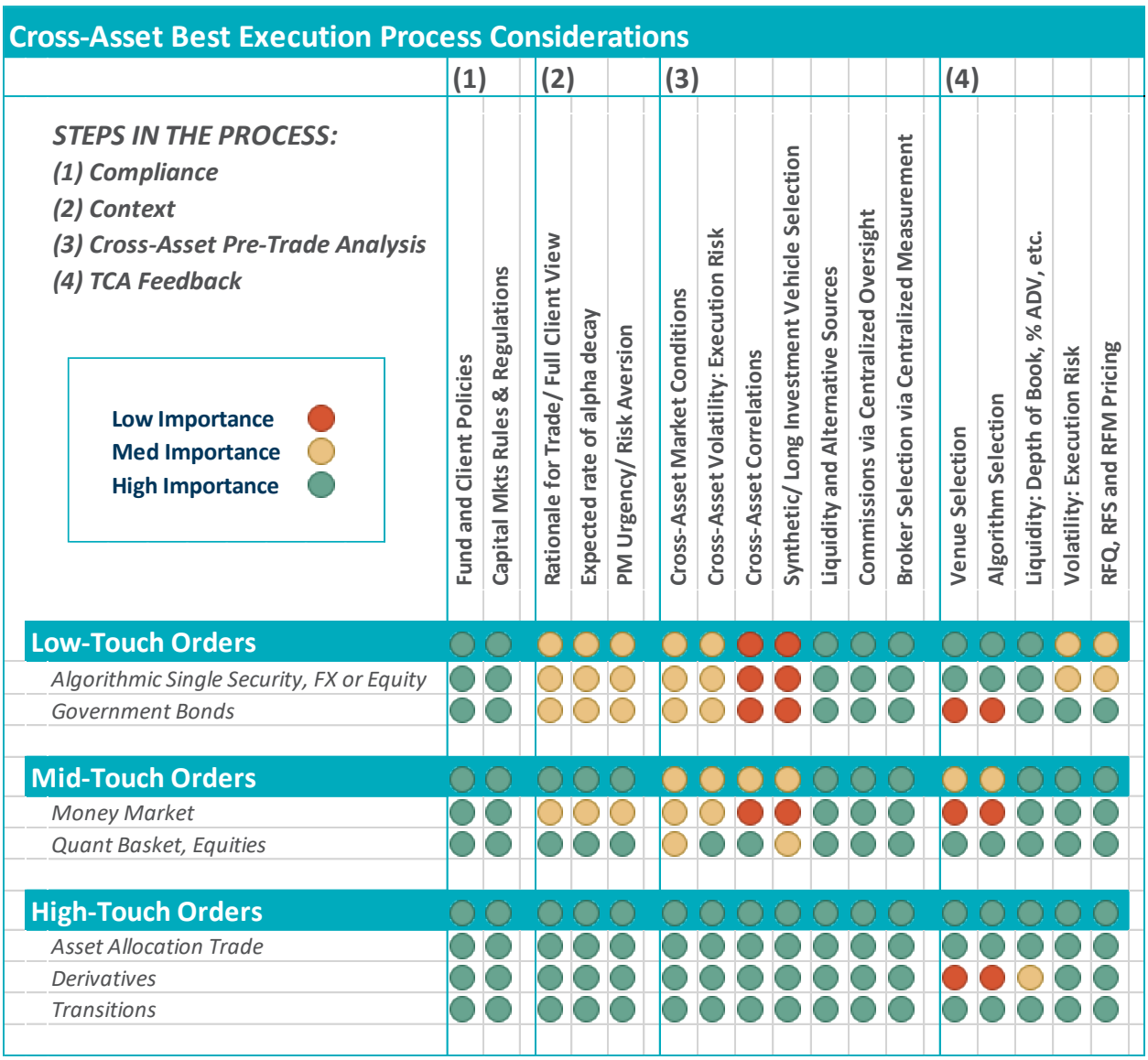
(3) Cross-Asset Pre-Trade Analysis. Traders on a centralized trading desk are best positioned to incorporate insights from multiple asset classes in their trading. These include global market conditions, cross-asset volatility and correlations, and significant breadth in venue and liquidity options. Skilled multi-asset traders manage commissions

and broker relationships with one voice, driving costs lower. They advise portfolio managers on which instrument provides the lowest overall cost, most liquidity, least basis risk and lowest leverage. They supplement their cross-asset pre-trade analysis with traditional metrics within the EMSs.

(4) **TCA Feedback.** Transaction cost analysis provides feedback to the centralized trading desk to improve the process. Analysis includes trader, broker, venue and algorithm performance, RFQ pricing and more.

In a cross-asset best execution framework, orders are segmented by their characteristics: “low-touch”, “mid-touch”, and “high-touch”. Within each category, best execution metrics are often the same, but may vary. For example, within the “low-touch” category, the selection of synthetic/ long investment vehicle is highlighted as red (low importance) in the chart below, as it is for each of the instruments underneath, (algorithmic single security and government bonds). However, for “mid-touch” and “high-touch” trades, analysis of synthetic alternatives typically has medium and high importance respectively.

Traders must do more analysis to determine the best possible result. EMS and OMS platforms assist centralized trading desks in systematically managing these metrics, and TCA tools help in reviewing and improving the process on a post-trade basis. Compliance rules run throughout the life cycle of the trades and reports automatically run on a T+1 basis, checking for adherence to firm-wide best execution practices.



A key success criterion for centralized trading includes segmenting orders into "low-touch", "mid-touch" and "high-touch", based on the needs of the trade. A leading OMS facilitates this process and the OMS, EMSs and TCA tools together support cross-asset best execution. Firms automate low touch orders within the OMS, leaving more time for skilled traders to handle the more complex "mid-touch" and "high-touch" orders. The EMSs supports cross-asset pre-trade analysis, and TCA provides ongoing feedback to improve the process.

CENTRALIZED TRADING: A HUB FOR DATA, INSIGHTS AND COLLABORATION

Asset management firms that implement an OMS and centralized trading can gain a competitive advantage in data analysis and market intelligence. Access to information and data is key in trading – it is used to develop strategies, best execution and transaction cost analysis, as we discussed above. Traders increasingly focus on gathering, storing, analyzing, and acting on data more systematically. We

anticipate that the need for insights from multi-asset TCA will continue to grow in the future, not only given the increasing demand for transparency from clients and regulators, but also because of the many ways that centralized trading data, supported by technology, can benefit the firm:

- Asset class teams naturally struggle to collaborate with their colleagues due to the segmented nature of their technical mandates. This situation is made worse when systems are not integrated, and data is not shared. Centrally stored and readily accessible trade and market data facilitates the free flow of information and market intelligence among departments and management, promoting collaboration. **A centralized desk is a meeting place to discuss data before it decays in relevance, and to uncover high-impact insights through deeper analysis and collaborative discussions.** Management teams can oversee cross-asset views from a client perspective and make decisions that are more informed.

- **Centralized commission management is another key example of the benefit of centralized data management on a trading desk.** Firms have a regulatory and fiduciary obligation to clients to demonstrate that the value they receive in research is commensurate with the commissions paid. The OMS facilitates recording commission data automatically across asset classes in a single system, with no manual intervention needed. Firms can then implement centralized broker scorecards backed by TCA performance data and historical commission payments. Traders can then seamlessly pull and present broker assessments using tools like Tableau or Power BI. One data-informed voice, from a single trading desk can negotiate lower commissions and hold brokers accountable throughout the firm.

  This is what a asset manager had to say about broker relationship management:

  "When we used to have a problem with a broker, we never knew which portfolio manager to go to for help. Now that we've implemented centralized relationship and commission management on our trading desk, I know exactly who to go to. We had some operational issues with Goldman Sachs initially, but after our trading desk spoke with them, they quickly improved their service levels. They know we have a vote in the process, even though they don't know the size of it."

  ~ Senior Operations Individual

- In Greenwich Associates' report, *Top 9 Market Structure Trends for 2019,*[55] the authors noted that $300 million was spent on alternative data in 2018. Not surprisingly, they then went on to predict that trading would become even more data-focused next year (yet again!). They expect continued increasing uptake in transaction cost analysis in all asset classes, both from the perspective of gaining additional trading insights, and to meet growing regulatory requirements. **The reality is data costs for trading will continue to rise. Firms that implement centralized dealings can mitigate the rising costs.** Examples include per-user TCA licenses, EMS licenses, and market data, such as depth of book.

[55] Greenwich Associates. (2019). **https://www.greenwich.com/equities/top-9-market-structure-trends-2019**

As data becomes more crucial to trading teams and investment management generally, **a key success criterion is the free-flow of aggregated, cross-asset information from a centralized trading desk.** Cross-asset collaboration supports a culture of continual improvement, increased teamwork and communication, and likely better decisions and outcomes for clients. Centralized data includes management and oversight of commission payments. Through one voice, on a single trading desk, clients pay lower fees and brokers are held accountable for better terms and service across the firm.

CHAPTER KEY TAKE-AWAYS

- Implementing a leading OMS, integrated with EMS and TCA platforms, is a key milestone in centralizing trading.
- To capture the full value of the significant investment in a leading OMS, asset managers should revise first their processes to ensure cross-asset best execution and best practices in order handling. These include:
    - Segment orders by trading characteristics (i.e., low-touch", "mid-touch" and "high-touch")
    - Develop firm-wide processes that include codification of steps and criteria within the OMS and EMS
    - Centralize cross-asset trade and market data on one dealing desk
    - Centralize commission and broker partner relationship management on a single trading desk

See the KEY CRITERIA CHECKLIST for Technology and Process Requirements best practices.

ESTIMATING THE ANNUAL NET BENEFIT OF CENTRALIZED TRADING

The decision to implement centralized trading is unique for every firm. From a cost recovery perspective, the benefits of centralized trading need to outweigh the costs of implementing a leading OMS. Firms need to estimate implementation and annual, ongoing costs for a leading OMS, including vendor costs, internal IT costs, external audit, external counsel, compliance set-up, KPI validations, etc.

The benefits are much harder to estimate, such as the legal, reputational, and key person risks of not implementing centralized dealings, or the new trading and investment opportunities that centralized dealings facilitates. Nevertheless, keeping in mind the wide range of potential outcomes, we estimate these benefits using the categories and components described in the "Potential Future State" within the prior section called, ***Implementation Facilitated by Technology***.

POTENTIAL BENEFITS

AUTOMATION AND COMPRESSION SAVINGS

- ✓ Automated & Harmonized Dealing Procedures & Records
- ✓ Automated Fair & Equitable Trade Allocations for Client Accounts
- ✓ Automated Firm-Wide Compliance Rules
- ✓ Automated Execution of Cross-Asset "Low-touch" Orders, Firm-Wide Trade Netting
- ✓ Compression Savings from Product Density
- ✓ One Workflow, STP & Removal of Bespoke Processes
- ✓ Real-time Portfolio Views and Live Fills for Traders and PMs
- ✓ Faster Executions
- ✓ Reduced Operational Risks and Errors

IMPROVED PROCESSES AND OVERSIGHT

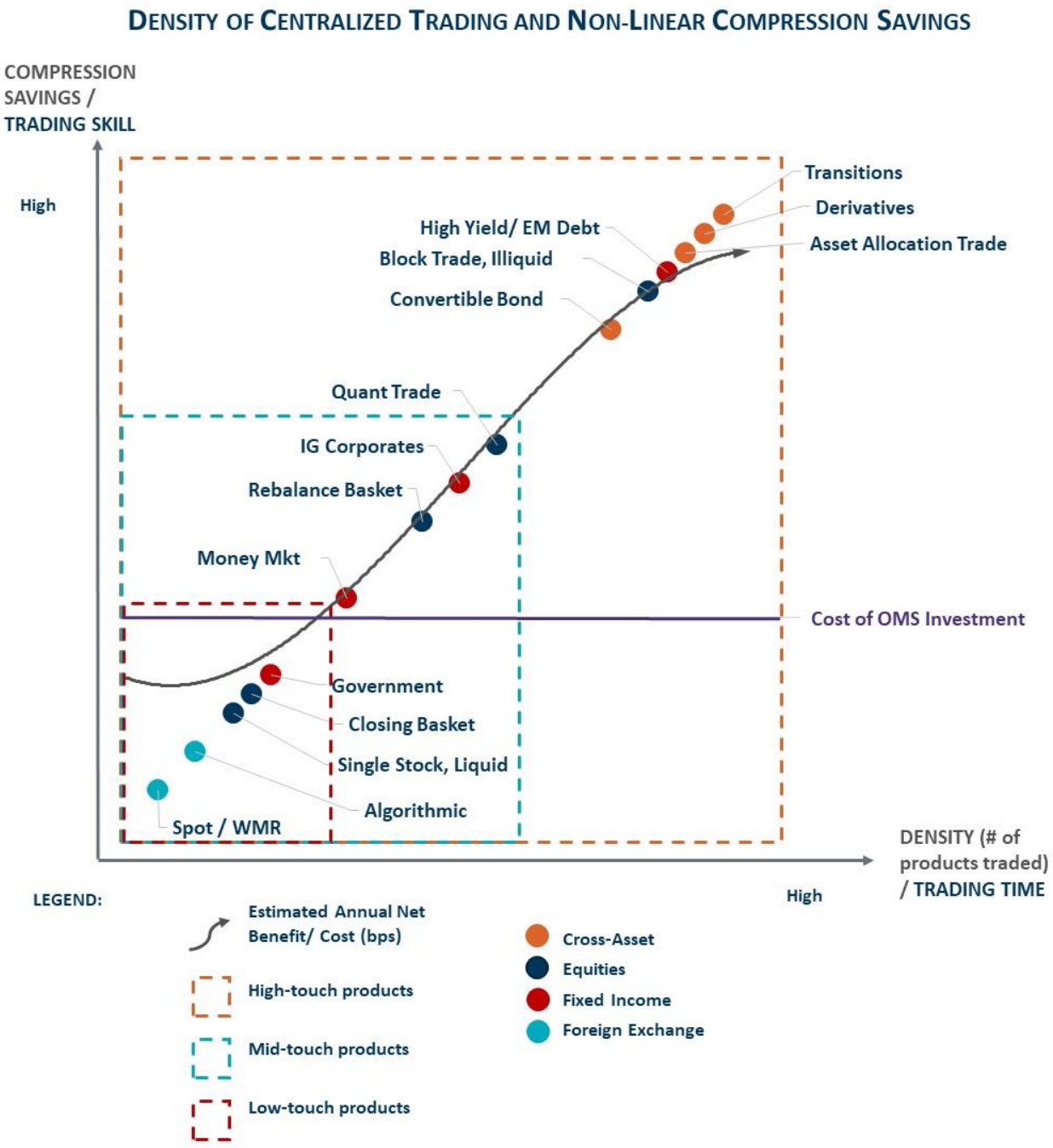
- ✓ Cross-Asset Best Execution & Segregation of Duties
- ✓ Centralized Commission & Relationship Management: One Voice & Negotiation = Improved Accountability, Bundled & Volume-Driven Pricing, Access to Deal Flow
- ✓ Firm-Wide Compliance: One Control = Improved Oversight
- ✓ Cross-Asset Order Segmentation by Characteristics
- ✓ Scalable Growth and Evolution
- ✓ Reduced Legal, Reputational & Key Person Risks

NEW INSIGHTS, DATA AND TRADING OPPORTUNITIES

- ✓ Collaboration Among Teams and Management
- ✓ Free Flow of Information, Management Oversight
- ✓ Real-Time Data and Cross-Asset Insights: Front Office Positions, Transactions, Market Data, Performance, Risk & Analytics
- ✓ Cross-Asset Trading Strategies: E.g., Hedge Fund Strategies, Asset Allocation Trades, Indexing Trades, Switch Trades, Hybrid Securities, Derivatives Instrument Optimization, ESG
- ✓ Cross-Asset Market Intelligence from One Trading Team
- ✓ Vocational Specialization & Portfolio Manager Time Savings

SCENARIO ANALYSIS

Presenting a base-case for analysis, we assume that the firm trades $50 billion per year[56] and has a diverse range of products and strategies, including low-touch, mid-touch and high-touch orders. We amortize the estimated implementation costs over a ten-year period.

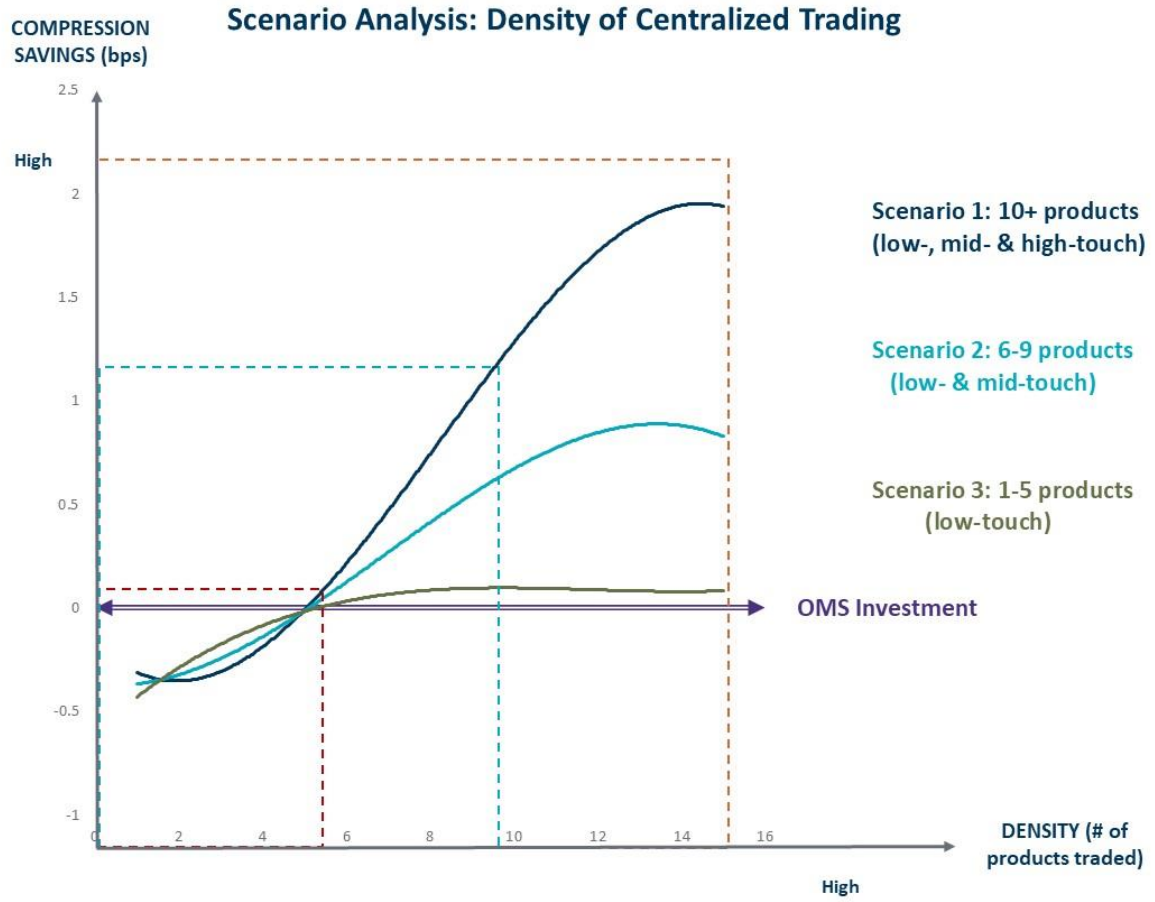


[56] Volume based on one-way flow. Two-way or round-trip volume would be $25 billion per year.

The grey polynomial line represents the annual net benefit (or cost) of centralized trading (i.e., compression savings). Compression savings are analogous to building a cross-asset bridge - by increasing the flow on the bridge, the toll will drop. The purple horizontal line is the cost of implementing a leading OMS. The x-axis on the graph represents the number of products traded on a centralized desk, and for each product, it represents the amount of time required to trade. The y-axis represents the compression savings due to greater product density, and for each product it represents the skill required to trade.

To further test and assess the impact of the firm's product mix, we estimate the compression savings for firms with the following number of products traded:

Scenario 1 *(Base Case)*:	10+ products (variety of low-, mid- and high-touch)
Scenario 2:	6 to 9 products (low- and mid-touch)
Scenario 3:	1 to 5 products (low-touch)



The key findings from the scenario analysis are as following:

1. **The benefits of centralized trading are non-linear.** As a firm moves more products to its centralized desk, it realizes increasingly greater efficiencies and risk reduction with each addition. While there are several examples of this, we highlight three noteworthy ones below:

    - **Commission management:** Centralizing the oversight of commission payments helps firms ensure fair payment for fair services. Each additional product or service provided by a broker-partner not only strengthens the relationship across the firm, but also the bargaining power of the asset manager. A single trading desk can negotiate lower commissions with one voice across multiple products – a non-linear benefit – while holding brokers accountable for the quality of service they provide.

    - **Reduced risks:** The benefits of a strong risk management framework are inherently uncertain. We do not know if risks will emerge, and what their magnitude will be. Nevertheless, as the complexity of an investment increases, the potential for losses increases non-linearly. Therefore, it is imperative to implement centralized controls and oversight mechanisms, and to promote sharing of centralized trade data with risk, compliance, and investment professionals. Centralized trading can help reduce the moral hazard of traders and portfolio managers who might otherwise engage in risky behaviour.

    - **New trading and cross-asset insights:** In contrast with the potential for non-linear losses in a decentralized trading environment, a centralized trading environment facilitates the potential for non-linear gains. A combination of vocational specialization, cross-asset market intelligence and the free-flow of trading information set the stage for new opportunities and better execution results. An example of this occurs when a trader advises a portfolio manager on the instrument to use to gain an exposure – swap, futures, options, ETF or physical, in consideration of the lowest overall costs, most liquidity and least basis risk.

2. **Firms with different product mixes will not benefit equally from centralized dealings.** Firms with larger proportions of high-touch (Scenario 1), and to a lesser degree mid-touch orders (Scenario 2) are expected see the greatest compression savings.

3. **Smaller firms will not benefit equally from centralized dealings.** In our analysis we assumed that firms traded $50 billion per year. As the volume and value traded decreases, it becomes more challenging to overcome the costs of implementing an OMS. Smaller firms may need to forgo some of the benefits of centralized trading and choose outsourcing as a lower-cost solution.

CHAPTER KEY TAKE-AWAYS

- The potential benefits and compression savings of centralized trading are different for each firm. Individual firms should undertake firm-specific cost/ benefit analyses, and recognize that the realized benefits to their firm will fall within a range of possible outcomes based on the degree to which the ex-ante estimated benefits are achieved.
- Our scenario analysis, which estimates the costs of implementing a leading OMS against the benefits, for a "typical" firm, concludes that firms with both of the following characteristics should meet the cost/ benefit requirements for centralized dealings:
    - *The firm has a varied product mix and/ or a large proportion of high-touch orders*
    - *The firm is mid or large-sized with sufficient trading volumes to decrease the cost per trade from technology.*
- If the criteria above are not met, the unique circumstances of the firm should be considered carefully. Firms that trade homogenous, low-touch order types may also estimate a net benefit from centralized trading, if the value traded is high enough. In addition, smaller firms may also expect to realize a net benefit from centralized trading, if the complexity of their product mix is high.

See the KEY CRITERIA CHECKLIST for Estimating the Annual Net Benefit of Centralized Trading.

KEY BARRIERS TO IMPLEMENTATION

Despite the many benefits of centralized dealings, three primary barriers restrict some firms from reaping the benefits: (1) implementation costs, linked to a firm's size, (2) working from home under Covid-19 requires a tailored approach, and (3) comfort level of portfolio managers when transitioning to centralized dealings.

We discuss each of these barriers below:

(1) **Centralized dealings are not necessarily an ideal solution for small asset managers, given the upfront costs in technology and personnel.** Investments include a leading OMS, fully integrated with EMSs and TCA platforms, and dedicated, fully trained trading staff. Without economies of scale, small firms cannot spread these costs over sufficient in-house trading volumes.

At the same time, the costs of running any type of trading desk (centralized or decentralized) are rising globally, due to increased regulatory, governance and technology requirements. Small firms may have no choice but to upgrade to centralized dealings or outsource their trading. For example, a small firm with only a few portfolio managers may prefer not to segregate the front office roles to reduce costs. However, regulations now require this segregation of duties in some jurisdictions, in addition to back-office functions.

(2) **Centralized dealings are feasible within a work-from-home environment.** The benefits of a centralized trading do not require one physical location. However, asset management firms must tailor their approach to address the risks of working from home to ensure the effectiveness of surveillance is not diminished.

(3) **Many portfolio managers, who have been executing their own trades, are eager and receptive to centralized dealings, as this provides them with more time to focus on their portfolio management responsibilities. Nevertheless, firms can anticipate that some portfolio managers may have a lower comfort level in the transition period.**

The main concerns relate to building execution expertise and transferring long-standing relationships. With respect to both items, our case studies have shown that collaboration between the teams is an effective solution, particularly over the short term while trust is established. Another key factor that contributes to an effective transition is endorsement by leadership teams that recognize and understand the benefits of centralized dealings to clients and the firm.

KEY CRITERIA CHECKLIST: IS YOUR FIRM READY FOR CENTRALIZED TRADING?

Review the key criteria checklists to determine the level of readiness of your firm for centralized trading

REGULATORY REQUIREMENTS

- ✓ **Put client interests first in all decisions regarding trading processes, controls and oversight.** Centralized dealings facilitate a holistic view of client needs.
- ✓ **Implement a cross-asset best execution approach to determine the best value and the best result for clients.** Firms can best consider all aspects of the trade through centralized dealings.
- ✓ **Segregate order generation, execution, and trade reconciliation duties for all asset classes.** Duplication of the controls needed in the front office in a decentralized trading framework introduces unnecessary risks, training for staff, and costs for clients.
- ✓ **Centralize controls and oversight through a single order management system.** Firms can best manage the increasing requirements of front office controls and compliance in a centralized trading framework.
- ✓ **Measure and manage costs centrally.** Centralized oversight and transparency can lead to greater discipline and lower research costs for clients. One data-informed voice can negotiate lower commissions and hold broker partners accountable throughout the firm. It is imperative that firms be readily able to demonstrate that the value received for research is commensurate with the amount paid, a component of best execution.

GOVERNANCE

- ✓ **Implement leading technology platforms, including a best-in-class OMS.** This is the foundation for implementing good governance practices in centralized dealings, including risk management.
- ✓ **Realign front and back office roles to focus on core competencies.** This can be a comparative advantage as it enables each professional to focus on long-term and short-term objectives, respectively.
- ✓ **Implement centralized firm-wide dealing directives.** Important components include a cross-asset definition of best execution, segregation of duties, fair and equitable trade allocation procedures, and cross-asset monitoring of portfolio positions and exposures by senior management.
- ✓ **Influence broker partners to meet minimum ESG criteria at the firm level**. This includes persuading brokers with one voice to improve ESG analysis within sell-side research.

WORK FROM HOME

- ✓ **Build and foster a culture of inclusivity and belonging with the centralized trading team and the firm.** Promote positive role modeling by leadership with trading staff.
- ✓ **Increase vigilance around the protection and surveillance of insider information.**
- ✓ **Prohibit the use of personal/ shared devices for communications with brokers.**
- ✓ **Log every conversation including new technology such as video calls and require staff to attest to compliance regularly.**

MARKET STRUCTURE & CROSS-ASSET CONSIDERATIONS

Firms with the following characteristics should realize significant value add from centralized dealings:

- ✓ **The firm engages in cross-asset and/ or asset allocation strategies.** Traders can better use their cross-asset expertise for these trades.
- ✓ **The firm manages substantial assets in-house.** Growth of internally managed funds has led to an increase in more complex and cross-asset trades, better handled by centralized implementation experts.
- ✓ **The firm's data and analytic needs are advanced, and it is willing and able to invest in leading technology.** This allows traders to take advantage of cross-asset insights acquired through the OMS, EMSs and TCA platforms.
- ✓ **The firm has a variety of order types that it can segment based on the needs of the trade and its characteristics.** The presence of multiple order types is key to best execution of each type of order. A leading OMS and EMS facilitate automation of "Low-touch" trades, freeing up valuable time for more complex, "high-touch" orders.

ALTERNATIVE DESK STRUCTURE CONSIDERATIONS

Firms with the following characteristics should realize significant value add from centralized dealings:

- ✓ **The firm is a global asset manager that engages predominately in active cross-asset strategies.** Centralized trading breaks down asset class silos and promotes idea generation through collaboration, centralized data and market insights.

- ✓ **The firm is a global asset manager that engages predominately in passive cross-asset strategies.** Highly skilled traders take an advisory role in assessing the best synthetic or physical instrument to trade.

Firms with the following characteristics may benefit on a net basis from centralized dealings:

- ✓ **The firm is a global mutual fund, insurance fund or multi-asset boutique with a global footprint.** Regionally centralized trading may make business sense if the firm's offices and portfolio managers, are spread out globally. Firms should minimize the number of centralized trading locations.
- ✓ **The firm is small, with single asset/ standardized flow.** These firms would benefit from many of the aspects of centralized trading but may need to forgo some of these benefits and choose outsourcing as a lower-cost solution.

TECHNOLOGY AND PROCESS REQUIREMENTS

- ✓ **Implement a leading cross-asset OMS, integrated with EMSs and TCA platforms.** Where feasible, we recommend centralizing processes first, followed by technology upgrades.
- ✓ **Segment orders into "low-touch", "mid-touch" and "high-touch", based on the needs of the trade.** Traders can automate most low touch orders within the EMS, leaving more time for skilled traders to handle complex "mid-touch" and "high-touch" orders. The EMS also supports cross-asset pre-trade analysis, and TCA provides ongoing feedback to improve the cross-asset best execution process.
- ✓ **Develop a firm-wide process to ensure cross-asset best execution and codify the steps and criteria within the OMS and EMS to the extent possible.** Low-touch, routine orders that are automated, have a higher likelihood of achieving best execution on an ongoing basis.
- ✓ **Centralize cross-asset trade and market data on one dealing desk.** The free-flow of cross-asset information not only reduces data costs and helps traders gain global market insights, but also increases collaboration among teams.

ESTIMATING THE ANNUAL NET BENEFIT OF CENTRALIZED TRADING

Firms with the following characteristics should realize significant value add from centralized dealings:

- ✓ **The firm has a varied product mix and/ or a large proportion of high-touch orders.** Firms that trade homogenous, low-touch order types may also estimate a net benefit from centralized trading, if the value traded is high enough.

- ✓ **The firm is mid or large-sized.** Higher trading volumes decrease the cost per trade from technology. Smaller firms may also expect to realize a net benefit from centralized trading, depending on the complexity of their product mix.

Next Steps

Following the review of best practices, we recommend that firms undertake the steps outlined below.

1) **FIRM-SPECIFIC REVIEW**: **Thoroughly assess the need for and requirements of further centralized trading at a firm.**

   We recommend considering the key success criteria for centralized trading defined in the key success checklist and analysing the firm's unique circumstances with respect to those criteria. We provide evidence to support the many benefits for clients and recommend a course of action.

2) **FIRM-SPECIFIC IMPLEMENTATION PLAN**: **Develop an implementation plan for centralized trading.**

   In this step, firms develop an implementation plan for centralized dealings, in consideration of the timing and operational needs of system upgrades and integration, and the impact on the business units during the transition.

RECOMMENDATIONS

Inspired by BCI's drive and desire to put clients' interests first, this paper has shown the many tangible and intangible benefits of a centralized execution desk in the asset management industry. Our findings and decision criteria are supported by a review of regulatory requirements, good governance models, market structure and cross-asset considerations, technology needs, the challenges when working from home and resource considerations. Case studies are discussed to share testimonials of the benefits and challenges that firms face. We provided evidence to support the many benefits for clients of centralized trading, but we also demonstrated that not all firms benefit equally from this structure. While global asset managers generally benefit from centralized dealings, smaller firms may need to consider outsourcing, and firms with global offices may prefer regional centralized trading. Regulators globally require a framework that protects investors from risks and fraud, while ensuring accountability for prudent dealings as part of a multi-asset best execution approach. A centralized dealings framework is imperative to reducing legal, reputational, and operational risks. In addition, the free-flow of aggregated trading, market and client portfolio information supports the collaboration and cross-asset insights needed to achieve world-class performance. As asset managers grow, transform, and strive to be world class, this is an opportune time to review best practices going forward.

GLOSSARY

Absolute Return Strategies – Absolute-return funds seek to achieve low-volatility and consistent returns that are uncorrelated with the market. To accomplish this goal, these funds typically use a wider variety of asset classes than just equities and bonds[57].

Algorithm – The use of pre-programmed instructions and decision criteria to execute a trade.

Canadian Securities Authority (CSA) - An umbrella organization encompassing provincial and territorial regulators, which relies on IIROC and other self-regulatory organizations to regulate dealers, and trading activity in Canada.

Centralized Dealings and Centralized Trading - A business framework in which a single group of traders handle all trades, across all asset classes throughout the firm, from one hub.

Commission Sharing Agreements (CSAs) – A type of soft dollar arrangement that allows money managers to separately pay the executing broker for trade execution and ask that the broker allocate a portion of the commission directly to an independent research provider.

Compression Savings – The cost savings that result from the addition of more products to a centralized trading desk.

Consolidated Tape – An electronic system that collates real-time exchange listed data, such as price and volume, and disseminates it to investors[58].

Conversion Ratio – The number of shares for which a convertible bond can be exchanged.

Convertible Bond Arbitrage Strategy - A classic convertible bond arbitrage strategy is to buy the relatively undervalued convertible bond and take a short position in the relatively overvalued underlying stock. The number of shares to sell short to achieve a delta neutral overall position is determined by the delta of the convertible bond[59].

Credit Default Swaps (CDS) – A derivative contract that allows one party to exchange or offset credit risk with a counterparty.

Credit Support Annex (CSA) – In privately-negotiated derivatives trading, this document outlines the how, when and what collateral is posted and transferred between counterparties.

Designated Market Makers (DMM) – A market maker at the NYSE responsible for maintaining fair and orderly markets for a set of listed stocks.

European Securities Markets Authority (ESMA) – The European Union securities markets regulator.

Event Driven Strategies – A type of investment strategy that attempts to take advantage of temporary stock mispricing, which can occur before or after a corporate event takes place[60].

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[57] Clifford, C. P., Bradford, J. & Riley, T. B. (2014). CFA Institute. Journal of Investing. *Do Absolute-Return Mutual Funds Have Absolute Returns?*

[58] Chen, J. (2019). Consolidated Tape. **https://www.investopedia.com/terms/c/consolidatedtape.asp**

[59] Barclay, L. T., Kaminski, K. M. & Sherman, M. G. (2020). CFA Institute. Refresher Reading 2020 CFA Program, Level III, Reading 26. Portfolio Management. Hedge Fund Strategies.

[60] Kenton, W. (2019). Event-Driven Strategy. **https://www.investopedia.com/terms/e/eventdriven.asp**

Execution Management System (EMS) – The system that provides access to market data and trading venues and are where traders typically route orders from for execution.

Factor-Based Asset Allocation – A process by which portfolio investments are selected based on underlying exposures.

Financial Conduct Authority (FCA) – The conduct regulator for 59,000 financial services firms and financial markets in the UK and the prudential supervisor for 49,000 firms, setting specific standards for 19,000 firms[61].

Financial Information eXchange (FIX) – A vendor-neutral electronic communications protocol for the international real-time exchange of securities transaction information. FIX has become the standard electronic protocol for pre-trade communications and trade execution[62].

Futures Contracts – A legal agreement to buy or sell a security or asset at a predetermined time in the future.

Fuzzy Matching – Software that can identify a bond that matches closely the characteristics of the bond, which the buy side or sell side, is trying to source. This technology is the best proof yet that there is a liquidity problem. Buy-side traders and portfolio managers are giving up on accessing certain bonds and trying for ones that nearly match the wanted criteria[63]**.**

Global Macro Strategies – Hedge fund or mutual fund strategies that base its holdings primarily on the overall economic and political views of various countries or their macroeconomic principles[64].

Hedge Fund Strategies – A variety of strategies such as long/short and global macro. Portfolio managers use leverage and a variety of instruments including derivatives and short positions.

High-Touch Orders – These are orders to which traders can add significant value, at the same time the cost of a poorly executed trade or missed liquidity could be high. They are often less time sensitive (requiring same-day execution, or several days). They may be larger, illiquid orders, such as a small-cap equity order or a corporate bond that has not traded in several months. Complex, multi-asset derivatives are “high-touch” as well as transition management trades.

Information Networks (INs) – These platforms source and aggregate liquidity. They provide a global view of liquidity and a choice of trading protocols and execution mechanisms from which to select. INs use a large amount of technology in the buy side and sell side’s internal systems.

ISDA – International Swaps and Derivatives Association

ISDA agreement – This is the master agreement for privately-negotiated or over-the-counter derivative trading between two counterparties.

Investment Book of Records (IBOR) – A centralized data repository used by buy-side firms for cash and position management.

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[61] FCA website. (Last updated 05/05/2020). **https://www.fca.org.uk/about/the-fca**

[62] Scott, G. (2019). Financial Information Exchange (FIX). **https://www.investopedia.com/terms/f/financial-information-exchange.asp**

[63] Callaghan, E. (2016). International Capital Markets Association (IMCA). Bond trading market structure and the buy side.

[64] Chen, J. (2019). Global Macro Strategy. **https://www.investopedia.com/terms/g/globalmacro.asp**

Liability Driven Investing (LDI) – This asset allocation framework focuses on covering all present and future liabilities. Investors select assets in order to minimize the risk of not meeting the liabilities.

LIBOR – The average interbank interest rate among a group of banks on the London money market, at a specific time, once during the day.

Limit Order – An order to buy or sell at no more than a specific price.

Low-Touch Orders – These are orders to which traders can add no or little value. They may or may not be time sensitive, but they must be liquid, and are typically smaller, with a relatively small and stable spread. Traders can complete these orders in the context of the quote or work them in over a short period. Rules-based automation of these orders through a leading OMS and EMS frees up traders' time for mid-touch and high-touch orders.

Managed Futures – Managed futures strategies are typically characterized as liquid, active across a wide range of asset classes, and able to go long or short with relative ease[65].

Market Neutral Strategies – A hedge fund strategy where the manager attempts to exploit differences in stock prices by being long and short an equal amount in closely related stocks[66].

Market Order – An order to be executed immediately, at the current market price.

Mean-Variance Optimization – The process of weighing risk, expressed as variance, against expected return. Investors use mean-variance analysis to make decisions about which financial instruments to invest in, based on how much risk they are willing to take on in exchange for different levels of reward[67].

Mid-Touch Orders – These are orders to which traders can add a small amount of value. They are often more time sensitive (requiring immediate or same-day execution). They may be larger, have medium liquidity and require some skill in handling. These orders may require skill in sourcing liquidity from all available venues and sources, management of information leakage, decision-making on strategy implementation, and monitoring the progress of the trade.

MiFID II – Markets in Financial Instruments Directive (MiFID) is a European regulation across the EU's financial markets. MiFID II replaced MiFID in 2018.

Order Management System (OMS) – This system provides portfolio managers with cross-asset, real-time views of their portfolios, and allows them to generate orders.

Over-the-counter trades (OTC) – These trades are typically via a broker-deal network, not cleared on a centralized exchange.

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[65] Barclay T. Leib, CFE, CAIA, Kathryn M. Kaminski, PhD, CAIA, and Mila Getmansky Sherman, PhD. (2020). CFA Institute. Refresher Reading 2020 CFA Program, Level III, Reading 26. Portfolio Management. Hedge Fund Strategies.

[66] Chen, J. (2019). Equity Market Neutral. **https://www.investopedia.com/terms/e/equitymarketneutral.asp**

[67] Chen, J. (2019). Mean-Variance Analysis. **https://www.investopedia.com/terms/m/meanvariance-analysis.asp**

Repurchase Agreements – A form of short-term borrowing for dealers in government securities. In the case of a repo, a dealer sells government securities to investors, usually on an overnight basis, and buys them back the following day at a slightly higher price[68].

Risk Budgeting – Once a target asset mix is determined in a risk parity framework, risk budging is the process of allocating risk (or risk capital) to each investment, rather than allocating dollar amounts.

Risk Parity – Risk parity is a class of investment strategies in which capital is allocated across asset classes so that each asset class contributes an equal amount of volatility to the total volatility of the portfolio. Because this approach favors larger allocations to lower-returning asset classes, leverage is used to achieve the desired expected return.[69]

Return on Equity (ROE) – The company's net profit divided by its average equity over the period.

Soft Dollars – This is a means of paying brokerage firms for their services through commission revenue, as opposed to through hard-dollar direct payments.

Stop loss – An order/ strategy to buy or sell once the stock reaches a certain price.

SWIFT - Society for Worldwide Interbank Financial Telecommunication

Trade Reporting and Compliance Engine (TRACE) – Trade Reporting and Compliance Engine (TRACE) is a program developed by the National Association of Securities Dealers (NASD) that allows for the reporting of over-the-counter (OTC) transactions pertaining to eligible fixed-income securities[70].

Transaction Cost Analysis (TCA) – This software provides feedback to traders, compliance officers and management to monitor best execution on a cross-asset basis.

Tri-Party Collateral Agreement – This is an arrangement between three parties. A third-party agent manages the collateral selection, payments and custody of securities on a fully segregated basis.

Warehousing risk – This refers to financial instruments held by banks for a period of time in order to facilitate trading or securitization activities.

WMR FX Trades – The WM/Reuters benchmark rates are determined over a one-minute fix period, from 30 seconds before to 30 seconds after the time of the fix, which is generally 4 pm in London. During this one-minute window, bid and offer rates from the order matching system and actual trades executed are captured. Since trades occur in milliseconds, only a sample is captured, rather than every trade.
The median bid and offer are calculated using valid rates over the fix period, and the mid-rate is then calculated from them[71].

Variance Swaps – Variance swaps are instruments used by investors for taking directional bets on implied versus realized volatility for speculative or hedging purposes. The term "variance swap" refers to the fact that these instruments have a payoff analogous to that of a swap. In a variance swap, the buyer of the contract will pay the difference between the fixed variance strike agreed on in the contract and

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[68] Reiff, N. (2020). Repurchase Agreement. **https://www.investopedia.com/terms/r/repurchaseagreement.asp**

[69] Cao, L. CFA Institute. (2018). Multi-Asset Strategies. The Future of Investment Management.

[70] Hayes, A. (2020). Trade Reporting and Compliance Engine – TRACE.
https://www.investopedia.com/terms/t/trace.asp#:~:text=Trade%20Reporting%20and%20Compliance%20Engine%20(TRACE)%20is%20a%20program%20developed,to%20eligible%20fixed%2Dincome%20securities.

[71] Chen, J. (2019). WM/Reuters Benchmark Rates. **https://www.investopedia.com/terms/w/wmreuters-benchmark-rates.asp**

the realized variance (annualized) on the underlying over the period specified and applied to a variance notional[72].

[72] Valbuzzi, B. CFA Institute. (2020). Refresher Reading 2020 CFA Program, Level III, Reading 16. Portfolio Management. Swaps, Forwards, and Futures Strategies.

REFERENCES

Allen, J. C. and Gellasch, T. CFA Institute. (2018). *The Future of Research in the US After Mifid II.*

Bank for International Settlements. (2016). *Electronic Trading in Fixed Income Markets.*

Bank for International Settlements. (2018). *Structural Changes in Banking after the Crisis.*

Berger-Soucy, L., Garriott, C. & Usche, A. Bank of Canada Financial Markets Department (2016). *Canadian Repo Market Ecology.*

The Boston Consulting Group. (2015). *Measuring the Impact of Canadian Pension Funds.* **https://image-src.bcg.com/Images/Measuring-Impact-of-Canadian-Pension-Funds-Oct-2015_tcm79-39773.pdf**

Buch, C. & Dages, B.G. chaired the Working Group established by the Committee on the Global Financial System. (2018). *Structural Changes in Banking after the Crisis.* **https://www.bis.org/publ/cgfs60.pdf**

Callaghan, E. (2016). International Capital Markets Association (IMCA). *Bond trading market structure and the buy side.*

Cao, L. CFA Institute. (2018). *Multi-Asset Strategies. The Future of Investment Management.*

Cutter Associates. (2020). *Outsourced Trading: Has the Time Come?*

European Securities and Markets Authority (ESMA) Review Panel. (2015). *Best Execution under MiFID. Peer Review Report.*

Factset. (2018). *The Evolution of the Multi-Asset Class Trading Desk. A White Paper Based on Research Findings from Alignment Systems.*

Fein, M. L. (2019). *ESG Investing by Pension Fiduciaries in Canada.*

Garriott, C. & Gray, K. Bank of Canada Financial Markets Department (2016). *Canadian Repo Market Ecology.*

Preece, R. CFA Institute. (2017). *Mifid II: A New Paradigm for Investment Research. Investor Perspectives on Research Costs and Procurement.*

Preece, R. CFA Institute. (2019). *Mifid II: One Year On. Assessing the Market for Investment Research.*

Rozanov, A. (2017). *Public Sector Investment Funds: How the Best-in-Breed Evolved.*

Schacht, K., Stokes, J.J., & Doggett, G. CFA Institute. (2012). *Asset Manager Code. Second Edition.*

SIFMA. (2019). *SIFMA Insights. Electronic Trading Market Structure Primer.* **https://www.sifma.org/wp-content/uploads/2019/10/SIFMA-Insights-Electronic-Trading-Market-Structure-Primer.pdf**

SIFMA. (2018). *SIFMA Insights. US Fixed Income Market Structure Primer.* **https://www.sifma.org/wp-content/uploads/2018/07/SIFMA-Insights-FIMS-Primer_FINAL.pdf?source=post_page**

World Bank Group. (2017). *The Evolution of the Canadian Pension Model.* **https://openknowledge.worldbank.org/bitstream/handle/10986/28828/121375.pdf?sequence=4&isAllowed=y**

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