

NOMURA

Meeting the Best Execution Criteria
Michael Simmonds
Head of Trading Analytics

14 October 2008

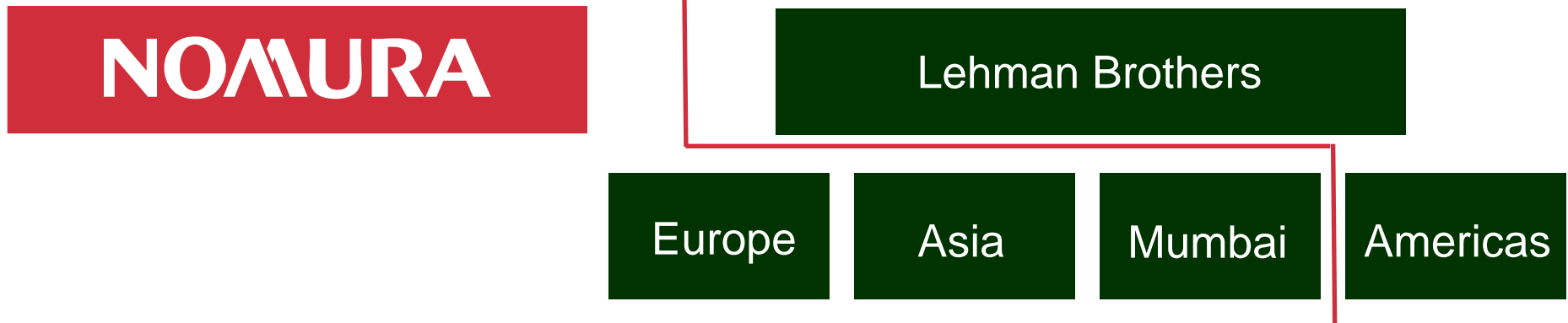
Actions

- Introduction
 - The Lehman to Nomura Migration
 - Formal definition of Best Execution versus Best Execution for a worked order
- Different Methodologies for Measuring and Achieving Best Execution
- Tools and Technologies to Measure Execution Quality
- Optimising Intraday Decision Processes via TCA

The Expansion of Nomura

Recent Acquisitions

- Nomura has been present in Sales/Trading of Equities in Europe for some time
- The potential to expand these capabilities and product coverage was obvious when the opportunity to acquire parts of Lehman Brothers arrived after it was declared bankrupt
- Nomura now includes all of the Asian business, all European Equities (including PB and relevant corporate divisions) and Investment Banking, and an important team of Quants and back office support in Mumbai



Formal Definition of Best Execution

- Article 21 of MiFID
 - " must take all reasonable steps to obtain the best possible result, taking into account price, costs, speed, likelihood of execution and settlement, size, nature or any other consideration relevant to the execution of the order."
- In general terms this is in the spirit of anyone acting on behalf of a client should do, but in practice the definition is (rightly) imprecise
- This means Best Execution policies focus on the outcome of individual market/internal executions
- However both the trading desk and its clients want the “best result” in aggregate
- Clients define aggregate level requirements on orders:
 - Risk Tolerance
 - Limit Restrictions
 - Internalisation Behaviour
 - Execution Style
- Then “best result” cannot automatically be achieved by looking at individual executions: macro behaviour is equally important (for example results show that perfect foresight in predicting volume and volatility can reduce mean implementation shortfall by 18%)

Methods to Acquire “Best Result”

- Identify the target/benchmark and measure against this
 - Historically many organisations have targeted a benchmark (first VWAP to measure technical performance, later implementation shortfall, risk appreciation)
 - Typically Implementation Shortfall is a target and this allows the trading desk to have a clear “unabused” target
 - Not the whole story.. Trading 1M USD Vodafone is not the same as trading 10M USD Bank of Greece

Trade	Trading Cost Estimate	Opportunity Risk
1M USD Vodafone	11.2	12.0
10M USD Bank of Greece	51.9	160.1

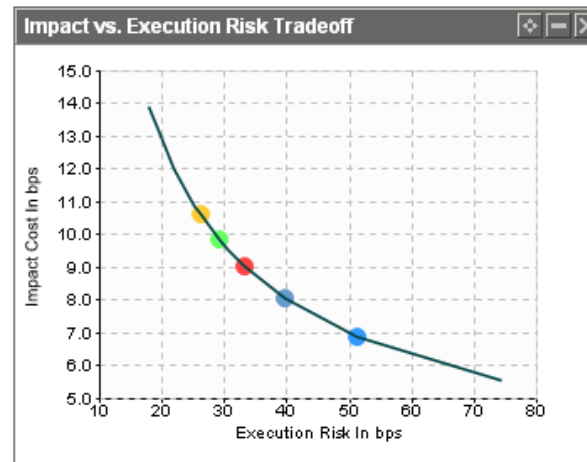
Based on trading out at a rate of 15% of the market

- Measure performance versus implementation shortfall estimate

The problem of risk

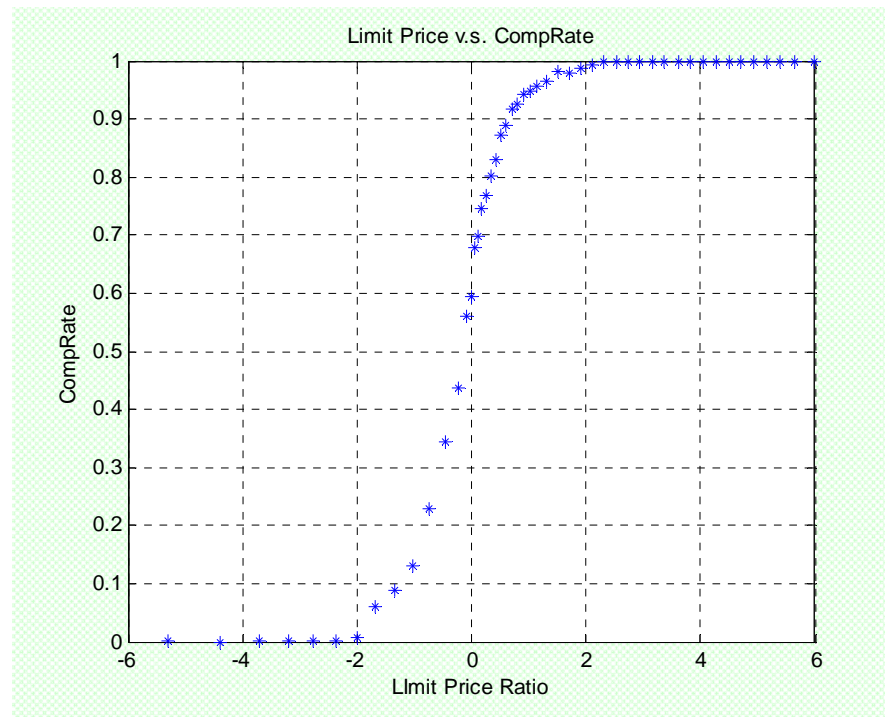
- If a trading desk aims to achieve the best aggregate performance versus strike price then, assuming there isn't particularly large intra-trade alpha, the best strategy is to trade **all** orders for the longest period acceptable
- This is less acceptable for clients sending a small number of orders to a trading desk: being close to the average is less likely
- Here the trader must have appreciation of his risk tolerance and he can work out trading strategy by optimising:

Implementation Shortfall Estimate + λ Opportunity Risk

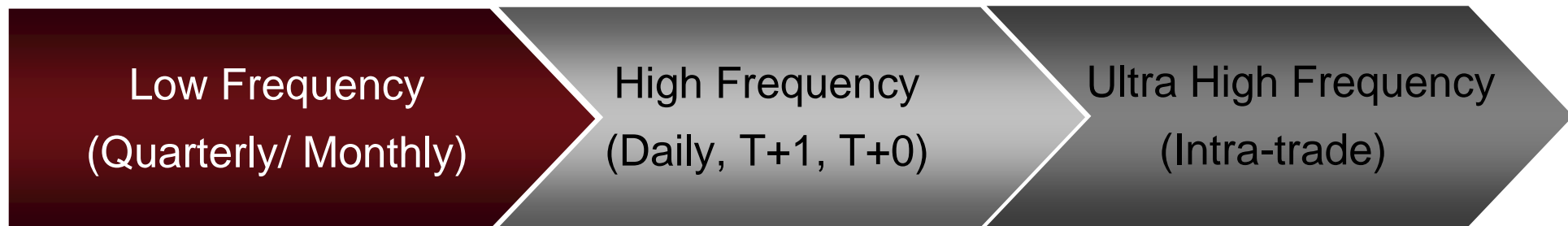


Fill Rate

- Risk adjusted cost has started to become more established
- Quant team at Nomura is interested in a new parameter: fill fraction
- Are worked order traders willing to forgo size to improve execution quality?



Measuring Execution Quality



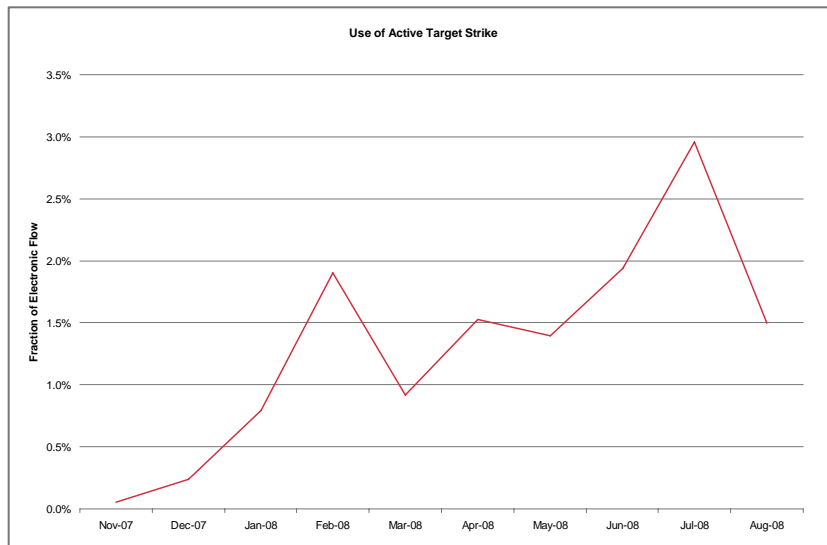
- Information providers:
 - In-house
 - Third Party TCA Provider
 - Broker Review(s)
 - Ideal to consider strategy changes
 - See trends in performance without focusing on individual trades
- Information providers:
 - In-house
 - EMS/OMS system
 - Broker Analytics
 - Track trading “mistakes”
 - Analyse performance when knowledge of market is still fresh
- Information providers:
 - In-house
 - EMS/OMS system
 - Broker Analytics
 - Adjust behaviour before trade completes

Measuring Performance Intra-Trade (Ultra High Frequency)

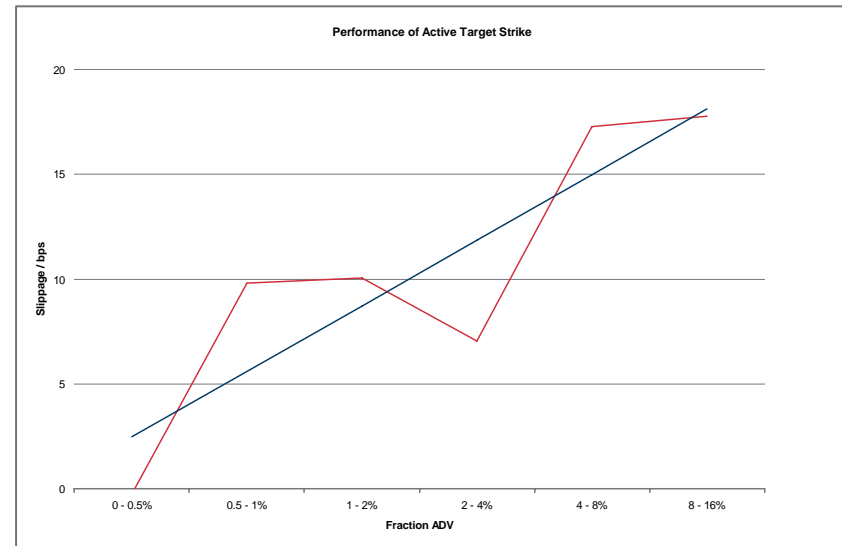
- If a trading desk is executing an order directly (rather than using a worked order desk or principal provision) it is usually monitored
- The principal reasons for monitoring a trade are two fold:
 - There are prices where the trade is no longer worth entering/ exiting
 - If the price improves or deteriorates the strategy of the trading desk changes
- Both of these approaches are commonly used. Although there are absolute levels at which many firms decide to stop a trade, changing behaviour is much more common
 - Aggressive In the Money (AIM): Become more “aggressive” when the price moves in your favour
 - Passive In the Money (PIM): Become more “passive” when prices moves in your favour
- Dynamically adaptive strategies (that change macro behaviour based both on market factors such as volatility and spreads as well as trade factors such as realised slippage) are increasingly popular

Adaptive Strategies

- Lehman in Europe produced a very popular strategy based on behavioural changes based on order completion that produced very good slippage results (Active Target Strike)
- Aggressively front loaded strategy that trades in line with the market at the start with opportunistic sweeps and access to the dark pool reducing to a much more passive rate to complete the order
- Performed particularly well for large orders
- We are in the process of producing dynamically adaptive strategies



Client self directed flow



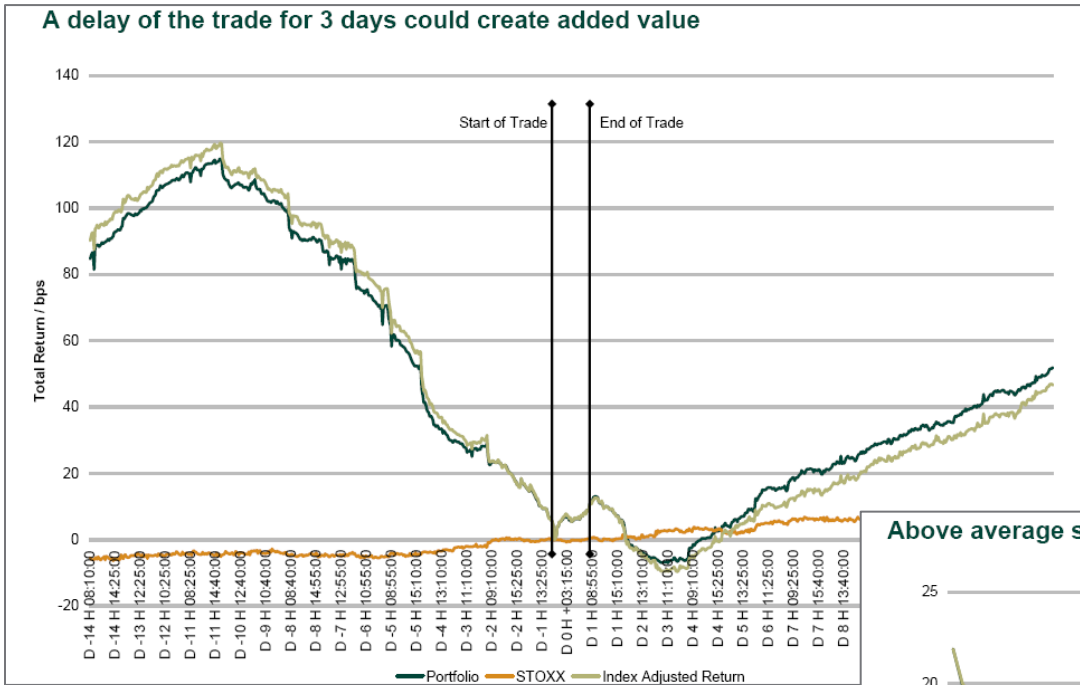
Positive slippage means outperformance

Low Frequency Review

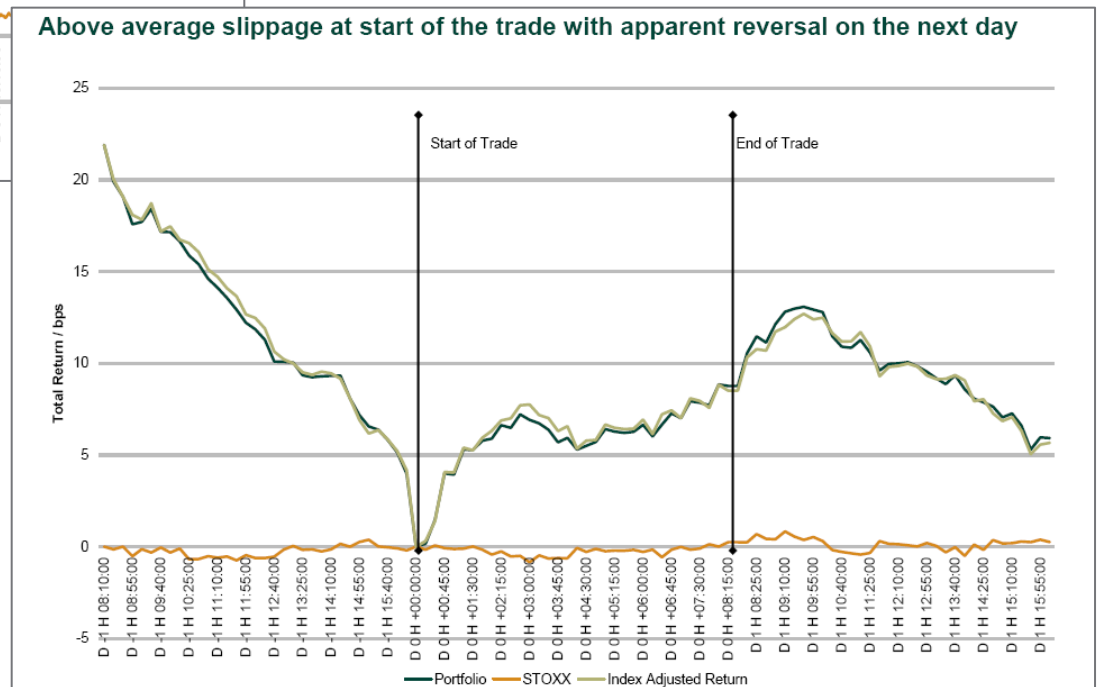
- Low frequency reviews allow for a different type of analysis
- More trades, over more varied background market conditions, provide more significant results
- Teams that gain most from these reviews are those with a wide variety of trades (such as trading desks) and quant firms
- Trading desks' performance can be measured versus the desks' chosen benchmarks and their trading examined: suggestions might include using different algo strategies, guaranteed principal provision, trading over different horizons
- For quant firms the analysis is slightly different: in addition to the above, the systematic nature of their stock selection means that there is a very important factor we also show: trade timing

Low Frequency Review

A delay of the trade for 3 days could create added value

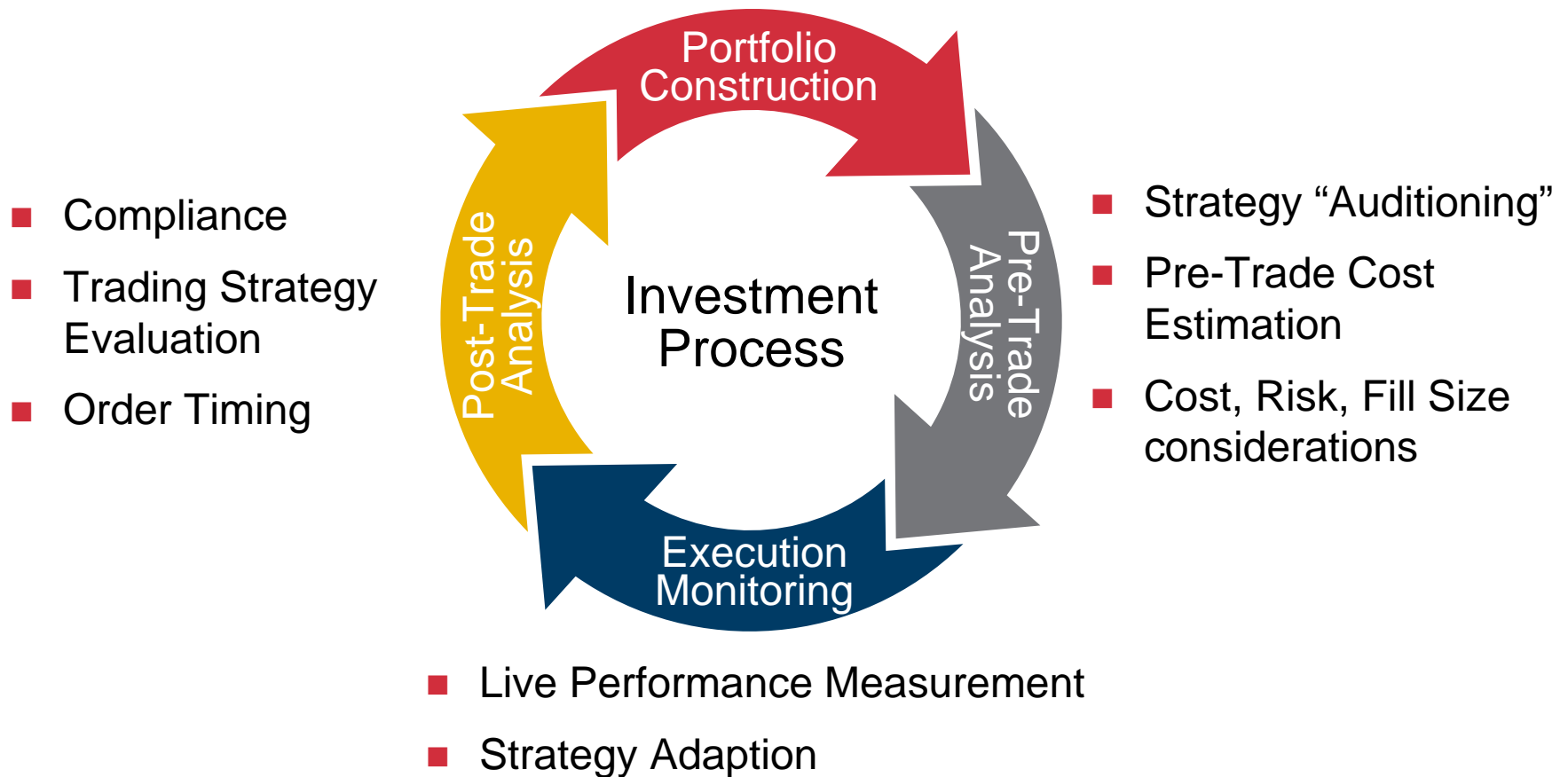


Above average slippage at start of the trade with apparent reversal on the next day



Quantitative Management of the Trading Cycle

- Cost Aware Portfolio Construction



Summary

- Establishing the “best result” goes beyond traditional MiFID definitions
- Important for trading desks and its clients to an appropriate benchmark accounting for risk tolerance and other parameters (flexibility to get filled)
- Intraday adaption strategies will become a combine trading desk knowledge and experience with systematic algorithms that adapt behaviour
- Increasingly clients are moving from desire to use algorithms to demanding analytics (pre-, intra- and post-trade) to inform trading decisions and algorithm use
- It is essential that broker reviews incorporate intraday TCA to minimise alpha leakage
- The criticality of integrating the alpha generation, strategy selection, strategy adaption and post-trade analysis processes is becoming increasingly evident

michael.simmonds@nomura.com

+44 (0) 207103 2448

DISCLAIMER

This presentation has been prepared and / or issued by Nomura International plc (and/or its affiliates) ("Nomura International") and has been approved by Nomura International plc, which is authorised and regulated by the Financial Services Authority and a member of the London Stock Exchange, in connection with its distribution in the European Economic Area. This document is for information purposes only and it should not be regarded as an offer to sell or as a solicitation of an offer to buy the securities or other instruments mentioned in it. No part of this presentation may be reproduced, transmitted, stored in a retrieval system or translated in any other language in any form, by any means without the prior written consent of Nomura International.

This presentation is confidential and has been furnished to the intended recipient solely for such recipient's information and private use and may not be referred to, disclosed, reproduced or redistributed, in whole or in part, to any other person.

No representation or warranty as to this presentation's accuracy, completeness or correctness is made and no reliance should be placed on the accuracy, completeness or correctness thereof. The information contained, and any opinions expressed, in this presentation are subject to change at any time and Nomura is under no obligation to inform the intended recipient or any other person of any such change.

Nomura International accepts no responsibility or liability whatsoever in relation to this presentation (including for any error contained in this presentation or in relation to the accuracy, completeness or correctness of this presentation or in relation to any projections, analyses, assumptions and/or opinions contained herein nor for any loss of profit or damages or any liability to a third party whatsoever arising from the use of this presentation). The exclusion of liability provided herein shall protect Nomura, its officers, employees, agents, representatives and/or associates in all circumstances.

This presentation is not intended to form the basis of any investment decision and does not constitute or form part of any offer to sell or an invitation to subscribe for, hold or purchase any securities or any other investment, and neither this presentation nor anything contained herein shall form the basis of or be relied on in connection with any contract or commitment whatsoever. This presentation is not, and should not be treated or relied upon as investment research or a research recommendation under applicable regulatory rules.

The products mentioned in this document may not be eligible for sale in some states or countries, and they may not be suitable for all types of investors. If an investor has any doubts about product suitability, he should consult his Nomura International representative. The value and the income produced by products may fluctuate, so that an investor may get back less than he invested. Value and income may be adversely affected by exchange rates, interest rates, or other factors. Past performance is not necessarily indicative of future results. If a product is income producing, part of the capital invested may be used to pay that income. Nomura International may make a market or deal as principal in the securities mentioned in this document or in options, futures, or other derivatives based thereon. In addition, Nomura International, its shareholders, directors, officers and / or employees, may from time to time have long or short positions in such securities or in options, futures, or other derivative instruments based thereon. One or more directors, officers, and / or employees of Nomura International may be a director of the issuer of the securities mentioned in this document.

© Nomura International plc 2008. All rights reserved.