

Asia-Pacific Equities

You Can't Manage What You Can't Measure – Comments on Effective Management of Trading Process through Effective and Relevant Measurements

“不以规矩，不成方圆”

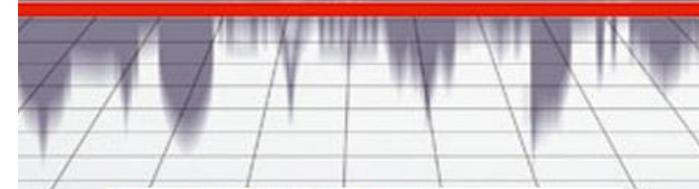
– 如何对交易过程进行量化及系统管理的几点建议

Hongsong Chou (周鸿松), Ph.D.

Nomura Quantitative Analytics and Algorithms – Asia-Pacific
(野村证券 亚太区 定量分析与算法交易部)

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Agenda

- **“You can’t manage what you can’t measure” – what does it mean?**
- **“You can’t manage what you can’t measure” – why is it important to trading?**
- **“You can’t manage what you can’t measure” – what to measure?**
- **“You can’t manage what you can’t measure” – how to measure?**
- **“You can’t manage what you can’t measure” – a case study on effective management of trading process through quantitative systems**
- **Conclusions**



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“You can’t manage what you can’t measure”

What does it mean?



A well-established “management” concept in the Western world

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Both those points are important. One, you can't measure everything of importance to management. And two, you must still manage these important things ...
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baike.baidu.com/view/166412.htm 2010-5-27 - 百度快照

不以规矩,不成方圆 - 百度知道
“不以规矩,不成方圆”,“规者,正圆之器;矩者,正方之器。”无规不成圆,无矩不成方。这句耳熟能详的... 规矩是人类自己制定的信条。规矩与我们的生活息息相关,例如,法规、校规、交通规则、文明公约、道德规范
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www.sinopecnews.com.cn/shnews/content/200... 2008-9-25 - 百度快照

- A basic concept in management science (管理科学), arguing that to determine the effectiveness (i.e., is it getting better or worse) of management process, one has to measure the process against various benchmarks, so as to ascertain if the situation has improved or deteriorated;

- 大概最接近的中文解释应该是“不以规矩，不成方圆”：

- “规”和“矩”是测量的工具；测量的标的则可以是多种多样的；

- “方”和“圆”既是测量的标准，也是工作最终的目的；

- 至于如何测量、测量的过程及结果如何量化以致有效公正...等等，则正是下面要深入探讨的。



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“You can’t manage what you can’t measure”

Why is it important to trading?



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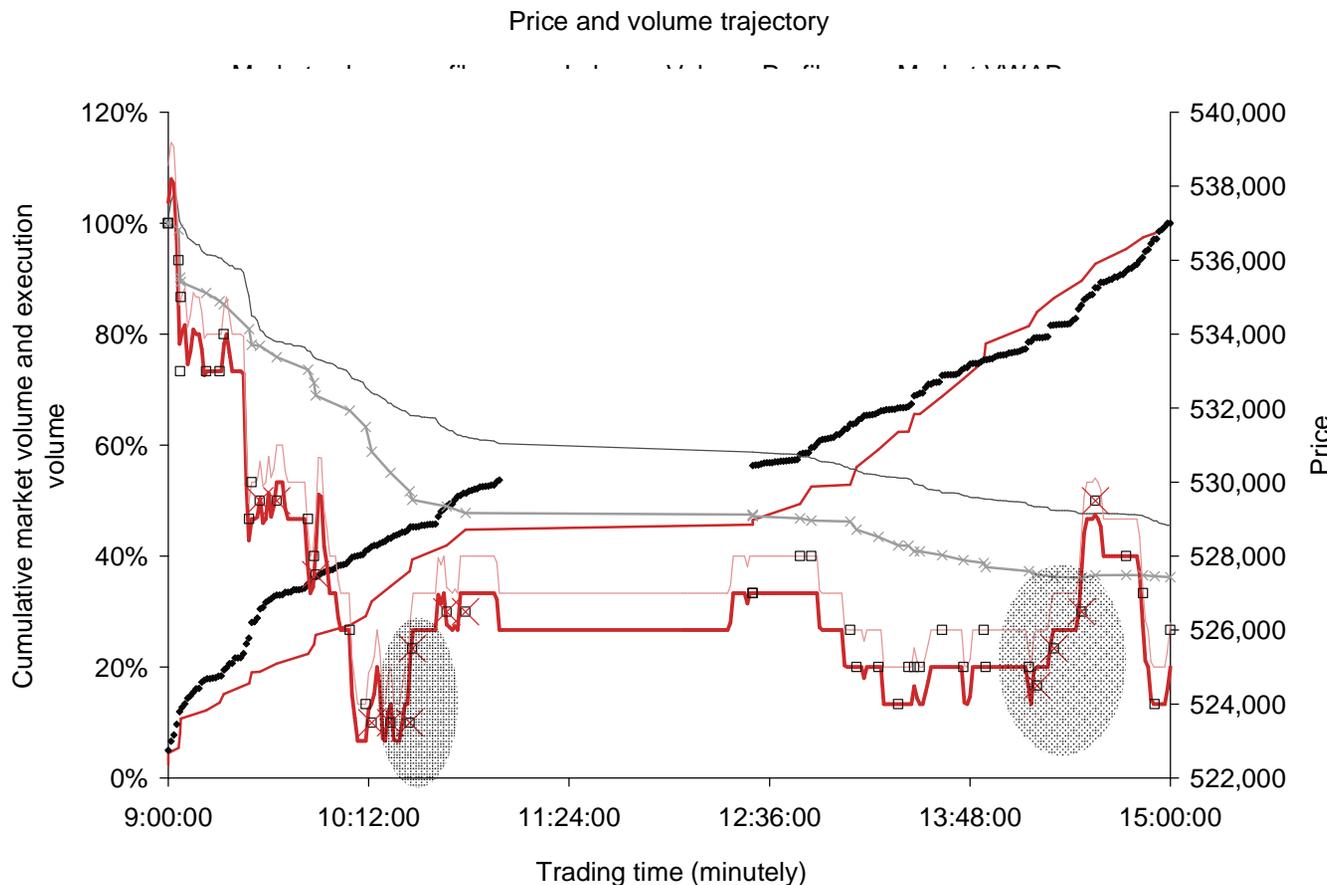
“Risk” cannot be managed if it cannot be measured

- Risk management is undoubtedly important to the trading operation, and it has to be managed at every step of a trading process:
 - Market and liquidity risk (市场与流通性风险) directly affects trading P&L;
 - Execution risk (交易过程中的执行风险) can lead to significantly loss if not controlled;
 - Operation risk (与结算和清算过程紧密相关的操作风险) can lead to potential legal and reputational damages to a trading desk and must be properly and strictly managed;
 - System risk (系统风险) may cause lost revenues on top of trading interruption and customer dissatisfaction;
- Because “Risk” and “Return” are two sides of the same coin for a trading desk, the same arguments can be applied to the discussion on “Returns”;
- Finally, it is worth noting that, even though many aspects of risk and return can be measured and quantified, they may not be completely mapped, which makes measuring and managing them more an “art” than “science”.



Crucial role that “measurement” plays in trading management

- The below real-life example shows that, without proper measurement of short-term price movement, users of dark pools are likely to be “adversely selected” by potential toxic flows in them.



- For traders who use “Dark Pool Crossing Engines”, “adverse selections” cannot be detected if no consistent measurement of short-term price momentum;
- Without a proper management of “adverse selection”, dark pool users will quite likely be “ripped off” by toxic flows...



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“You can’t manage what you can’t measure”

What to measure?



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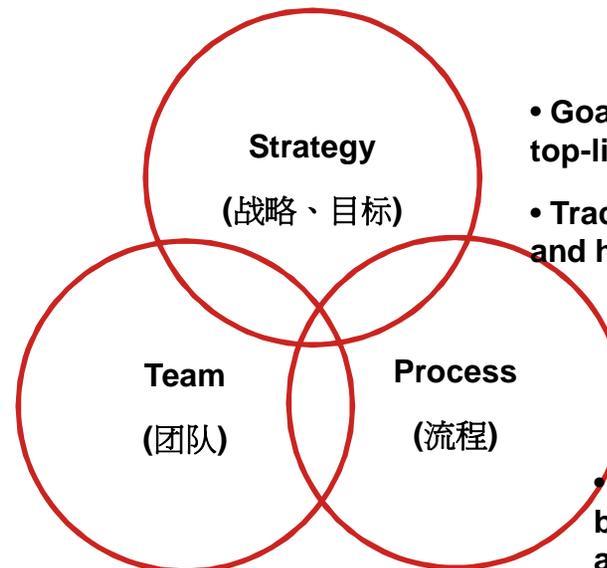
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High-level view of measurement metrics

- A generic framework of determining key measurement metrics focuses on three key aspects of trading operation: strategy (or, goal), process, and team:



- Goal-driven, pre-agreed metrics for productivity measures;

- The metrics should be along the dimensions of business goals;

- It is quite important to emphasize not only individual person's performance analysis, but also team/sub-team productivity.

- Goals that can be quantifiable, such as top-line and bottom-line targets;

- Tracking performance against temporal and horizontal benchmarks.

- Process-specific data that need to be persisted, both external information (such as market data) and internal process statistics (such as order and execution information);

- Rule-based data and analyses at various aggregation levels;

- Performance (or, speed)-related data and information that is both across time and across systems and desks.



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“You can’t manage what you can’t measure”

How to measure?



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Measurement should be done “systematically(程序化、系统化)”

- Like it or not, there are measurements that may be always “intangible”, especially on “Team” measurement;
- For metrics that are quantitative and driven by underlying data, measurements can be (and should be) done in a much more systematic way;
- Best practices in measuring include:
 - Determine relevant benchmarks;
 - Minimize overlapped effects so as to reduce signal convolution;
 - Ensure “cleanness” of data, especially from external vendors;
 - Store historical data and analysis as long as possible;
 - Have integrated and system-wide consistent views on measurements;
 - Aggregate data to provide function-specific “views”.
- Without a doubt, information technology will play crucial role in systematically measuring, storing, retrieving, analyzing and presenting results.



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“You can’t manage what you can’t measure”

A case study on effective management of trading process



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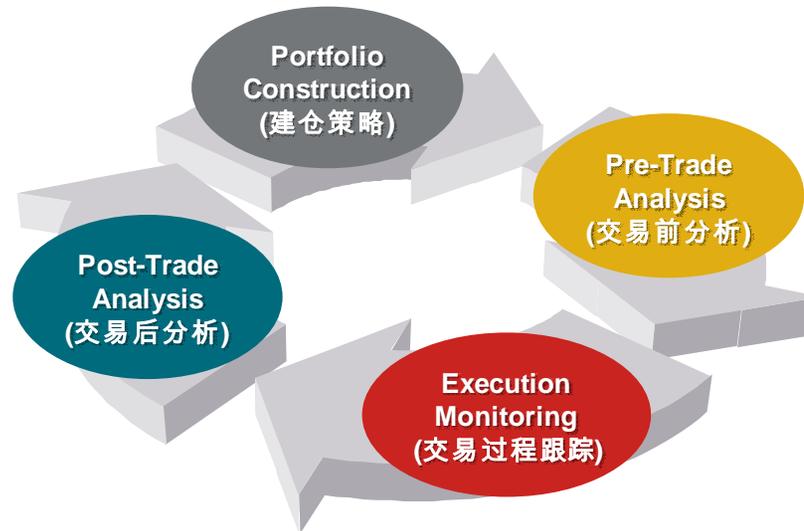
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Mapping of a trading process and key measurement points

- Goal: targeted return with constrained risk profiles;
- Benchmarked return and risk measures across various dimension such as PMs, markets, strategies, sectors, etc.

- Transaction cost/risk and alpha effectiveness-related measurements;
- Storage of market and execution related data for post-trade benchmarked performance analysis.



- Position related measurements on security, time, size, market risk, liquidity risk, attribution analysis, factor-based decomposition analysis, etc.

- Position, orders and execution related measurements;
- Benchmark determination and calculations;
- Market-specific data and analysis at various time scales and aggregation levels.

Example of pre-trade measurements for risk/cost control

The screenshot displays the TradeSpex interface for a single stock trade. The main window is titled "Pre-Trade Execution" and shows the security "5 HK" and quantity "1000000". The trade is for "BUY 1,000,000 HSBC HOLDINGS PLC HK (HKD)".

Key sections and data include:

- Market Data:** Shows price change of 1.44% at 9:25:57 (HKST). Last price is 77.25, Bid is 77.25, Ask is 77.30, VWAP is 76.15.
- Liquidity:** Shows position of 1,000,000 shares (5.02% of 19,610,000). Today's volume is 12,665,828 shares (63.49% of 19,610,000).
- Performance:** Shows last vs. open change of -0.3%, last vs. previous close of 1.4%, and last vs. VWAP of 0.8%.
- Spread/Depth & Risk:** Shows average spread of 7.3 bps, effective spread of 19.0 bps, and average bid size of 56,290 shares.
- Corp Announcements:** Nearest earnings report on Feb 28 2011, nearest ex-div date on Aug 18 2010.
- Hedge Summary:** Shows correlation of 81.17% and beta of 1.126 for the index future.

Several charts provide visual insights:

- Intraday Volume Profile:** Shows % ADV vs. Time of Day (HKST). It compares today's cumulative volume (red line) against a typical day's cumulative volume (green line) and a 3-month average (blue line).
- Impact Cost Over Time (Participation Rate):** A table showing cost and risk for different horizons:

Horizon	Cost (bps)	Risk Adj. Cost (85%) (bps)
44 min (very aggressive 35%)	22.1 +/- 43.5	67.2
53 min	20.7 +/- 47.0	69.4
1 hour 6 min (aggressive 26%)	19.3 +/- 51.5	72.2
1 hour 27 min	17.6 +/- 57.6	77.2
2 hours 3 min (neutral 15%)	15.7 +/- 66.5	84.6
2 hours 50 min (patient 10%)	13.4 +/- 81.4	97.7
3 hours 56 min	11.7 +/- 97.3	112.5
1 day 1 hour (very patient 5%)	10.4 +/- 115.1	129.7
- Intraday Volatility Profile:** Shows % Volatility vs. Time of Day (HKST), comparing intraday 30-min return volatility (blue line) with daily volatility (orange line).
- Impact vs. Execution Risk Tradeoff:** A scatter plot showing Impact Cost in bps vs. Execution Risk in bps, illustrating the trade-off between cost and risk.
- Intraday Spread Profile:** Shows Intraday Spread vs. Time of Day (HKST), comparing the current intraday spread (blue line) with the average daily spread (orange line).

• Market data

• Liquidity analysis

• Performance tracking against benchmark

• Market depth tracking

• Corporate action tracking

• Risk and tracking error monitoring, as well as hedge construction for real-time trading

• Intraday volume profile updates and real-time cumulative volume tracking

• Pre-trade market impact cost estimates

• Intraday volatility updates

• Trading cost and trading risk trade-off analysis

• Intraday bid-ask spread updates



Example of real-time monitoring of execution process

NOMURA ModelEx™ Monitor

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The screenshot displays the NOMURA ModelEx Monitor interface with several key components:

- Orders Table:** A table listing order details such as Symbol, Side, Quantity, and Strategy.
- Execution Chart:** A price-time chart showing order placement and execution with overlaid market information.
- Volume Chart:** A bar chart comparing trading volume against market volume.
- Cumulative Volume Chart:** A line chart comparing trading volume and market volume over time.
- Orderbook Pressure Chart:** A line chart showing trading signals for execution decision making.
- Summary Panel:** A detailed view of trade and performance metrics.

• Persistence of order and execution data;

• Order and execution details;

• Execution performance calculation in real time.

• Detailed order placement and execution process;

• Visually appealing presentations;

• Overlay with market information;

• Measuring market volume vs. trader's activities;

• Comparison between trading volume and market volume

• Trading signals for execution decision making.



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“You can’t manage what you can’t measure”

Conclusions and Discussions



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“You can’t manage what you can’t measure”

“ 不以规矩，不成方圆 ”

- **The ultimate goal of measurements is to improve business operation, so that business strategies can be more effectively and efficiently executed; to effectively manage trading process, measuring various metrics in trading operations against relevant benchmarks becomes a necessity;**
- **Metrics that can be used in measuring trading effectiveness and efficiencies can be broadly categorized to three groups: strategy-related, operation/process-related, and team-related;**
- **Due to time-sensitiveness and the large data amount in a trading process, persisting all kinds of external (or, market-driven) data and internal (or, process-driven) data is the first pre-requisite for effective measurement; on top of the data, analyses across various dimensions and aggregation layers become necessary, leading to decision-making results that can be easily and timely digested by management teams at various levels;**
- **Measurement needs to be done in a systematic way, for which information technology plays an “enabler” role;**
- **For any trading operation, the easiest place to start “measuring for better managing” is at the pre-trade/monitoring/post-trade stages of an investment cycle.**



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Thank you!

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