High Frequency Trading (HFT)

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Presented By: Axiom Traders
BEST Forex Broker from Central America

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KEY QUESTIONS

- What is high-frequency trading (HFT)?
- What is the economic contribution of HFT?
- Is HFT responsible for violations of market Integrity and/or for systemic risks?
- Is there a need for regulatory intervention?

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AGENDA

- Hierarchy and definitions of terms
- Algorithmic trading and High-frequency trading in detail
- Economic assessment: Impact of HFT on market quality
- Review of regulatory initiatives

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AT and HFT are Frequently mixed up in the public debate

Algorithmic Trading AT	The use of computer algorithms to **automatically** make certain trading decisions, submit orders, and manage those orders after submission. (Hendershott and Riordan 2009)
High Frequency Trading	Subset of algorithmic trading where **a large number** of **small-in-size orders** are sent into the market at **high speed**, with round-trip execution times usually measured in milliseconds. (Brogaard, 2010)
Ultra-HFT / Flash Trading	Subset of High-Frequency trading where a select group of trading firms, whom the exchanges allow to see orders a split second before the rest of the market, gain a significant advantage over other market participants

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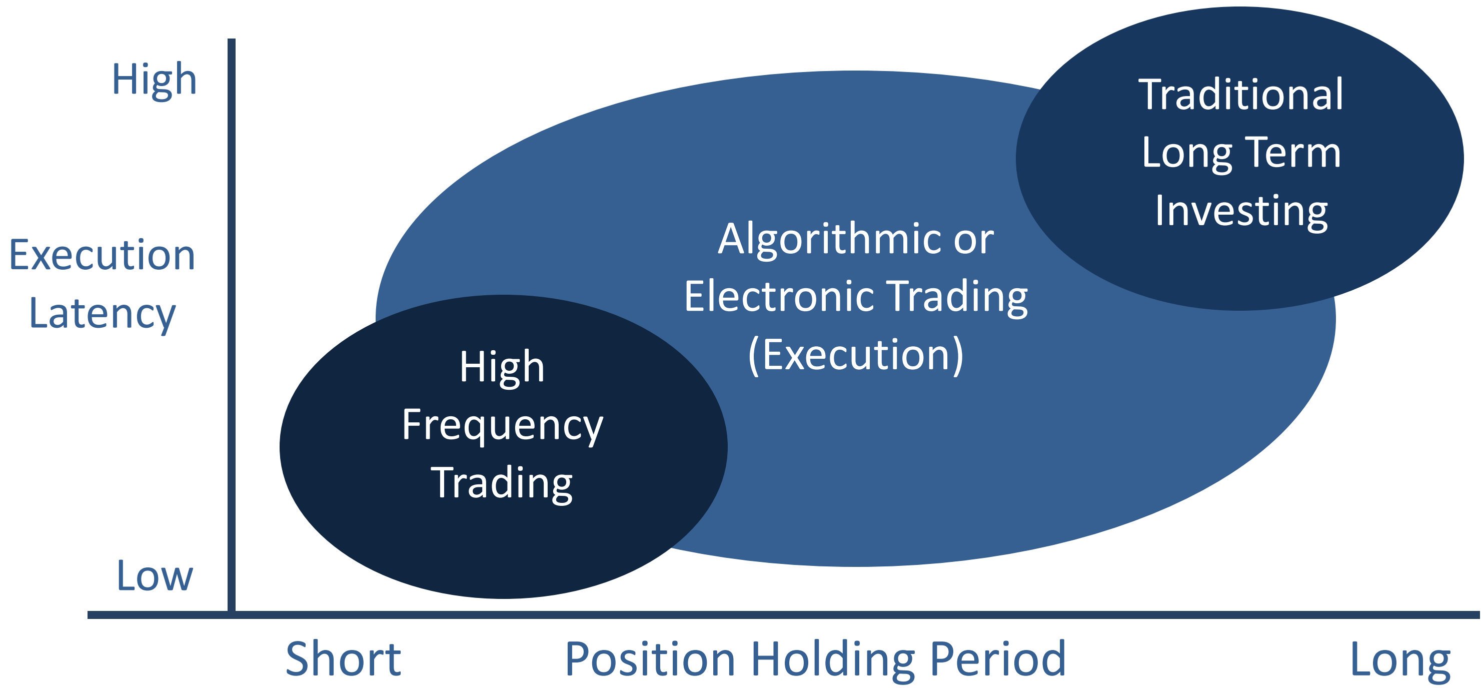
HFT vs. AT and Traditional Long Term Investing



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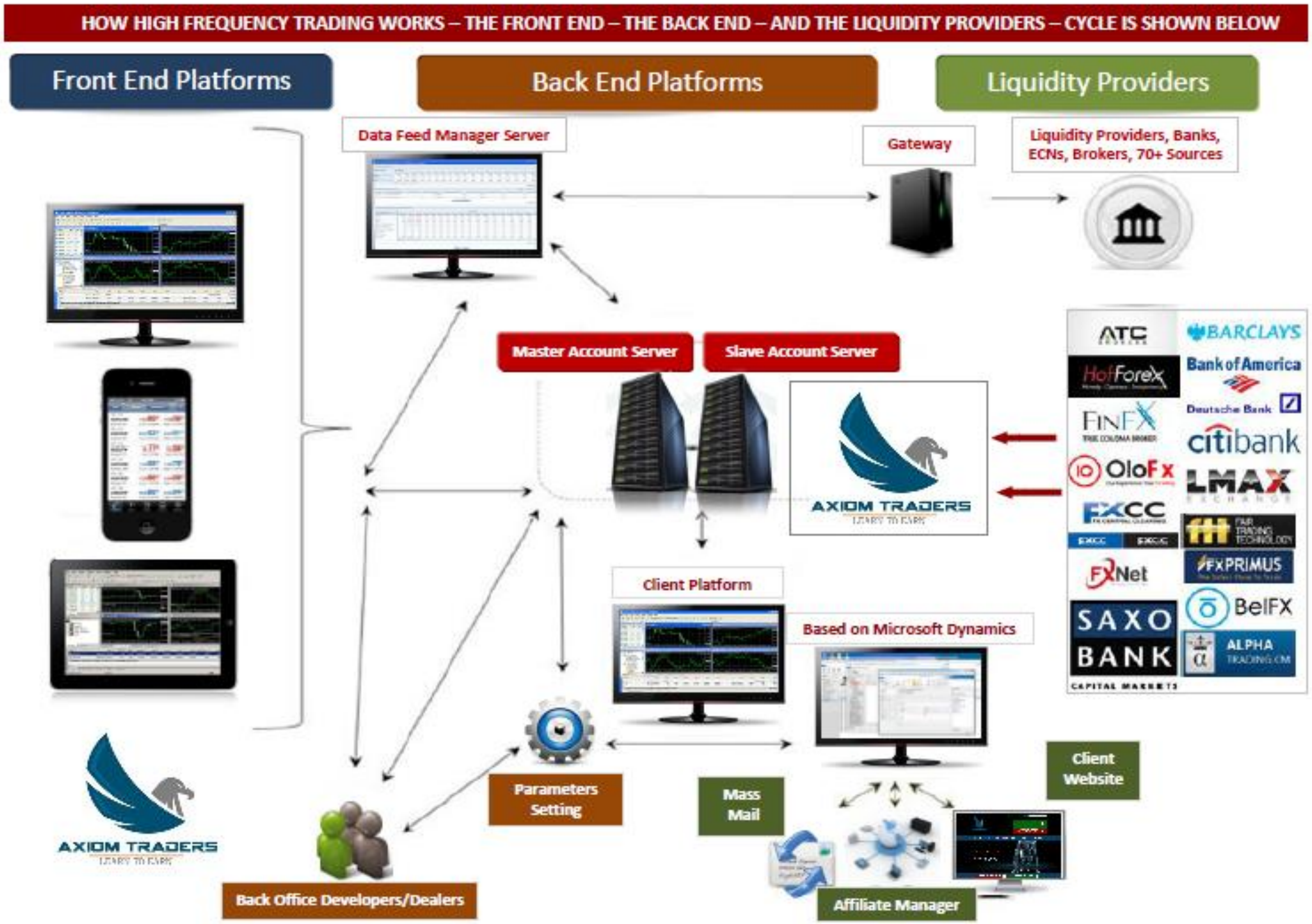

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ALGORITHMIC TRADING STRATEGIES

Name	Description of Strategy
Trade Execution Algorithms	Designed to minimize the price impact of **executing trades of large** volumes by 'shredding' orders into smaller parcels and slowly releasing these into the market releasing these into the market.
Strategy Implementation Algorithms	Designed to read real-time market data and **formulate trading signals** to be executed by trade execution algorithms. This may involve automatically **rebalancing portfolios** when certain pre-specified tolerance level are exceeded, **searching for arbitrage opportunities**, automatic quoting and hedging in a **market maker type role**, and producing trading signals from technical analysis.
Stealth/gaming algorithms	Designed to take advantage of the price movement caused when large trades are filled and also to large trades are filled, and also to **detect and outperform other detect and outperform other algorithmic strategies**.

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HIGH FREQUENCY TRADING STRATEGIES

Name	Description of Strategy
Electronic Market Making	**Liquidity-Providing Strategies** that mimic the traditional role market makers once played. These strategies involve making a two-sided market aiming at **profiting by earning the bid-ask spread**. This has evolved into what is known as Passive Rebate Arbitrage
Statistical Arbitrage	Traders look to correlate prices between securities and currencies in some way and trade off the **imbalances in those correlations.**
Liquidity Detection	Traders look to **decipher whether there are large orders** existing in a matching engine by sending out small orders ("pinging") to look for where large orders might be resting. When a small order is filled quickly, there is likely to be a large order behind it.

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WHO ARE THE PLAYERS AND HOW DO THEY EARN MONEY?

Large-scale turnover of numerous positions with a small return on each turnover

- HFTs are mainly proprietary traders (own-account); HFT is usually not conducted on an agency basis (for-clients)
- Segmentation of professional HFT Firm: proprietary trading firms (48%), proprietary trading desk of a multi-service broker-dealer (46%), or hedge funds (6%)
- All asset classes involved, extending from equities and derivatives into currencies and fixed income.
- Volume of HFT: No consistent figures on the size of HFT available (Estimations: 60-70% trading US trading volume and 40% in Europe.
- Prominent Players: Proprietary trading firms Getco, Optiver or Tradebot, hedge funds Citadel or Renaissance Technologies, and trading desks within multi-service market participants, e.g. at Goldman Sachs or Citigroup

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CHARACTERISTICS OFTEN ATTRIBUTED TO PROPRIETARY HFT FIRMS

The need for Speed is paramount

- High-speed and sophisticated quantitative and algorithmic computer programs for generating, routing, and executing orders.
- Real-Time Data.
- Very short time-frames for establishing and liquidating positions.
- Very large number of trades generated on a daily basis, of which often > 80% are cancelled shortly after submission.
- Ending the trading day flat (“delta-neutral”), i.e. without carrying significant, un-hedged positions over-night.

→ Speed matters in the absolute sense of achieving very small latencies, but even more so in the relative sense of being faster than competitors, even if only by a microsecond.

→ Usage of co-location / proximity services to minimize latency.

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IMPACT OF HFT ON LIQUIDITY

Provision of Liquidity and Linkage of Fragmented Markets

- Often read argument: HFTs provide no real liquidity because they are constantly attempting to flatten their position.

- Empirical evidence, however, suggests that……
  - ➢HFTs reduces spreads
  - ➢HFTs add substantial liquidity to the market
  - ➢HFTs alleviate effects of market fragmentation.

- From the academic side, there is no proof for a negative liquidity impact, but some issues still remain…..
  - ➢No market making obligation: HFTs are not obliged to provide liquidity.
  - ➢Size of Quotes: HFTs do not contribute to market depth.
  - ➢Accessibility: HFTs quotes may be added and cancelled in milliseconds

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IMPACT OF HFT ON PRICE DISCOVERY PROCESS

HFT is Widely seen as Beneficial

- HFTs tend to follow a price reversal strategy, driven by order imbalances, and so tend to stabilize prices.
- HFTs provide the best bid and offer quotes for a significant portion of the HFTs provide the best bid and offer quotes for a significant portion of the trading day (but only around a quarter of the book depth).
- Algorithmic traders' quotes play a larger role in the price formation process than human quotes.

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IMPACT OF HFT ON PRICE DISCOVERY PROCESS

HFT is Widely seen as Beneficial

NO PROOF FOR A NEGATIVE IMPACT ON THE PRICE DISCOVERY PROCESS:

- On the one hand, price discovery benefits from market participants who quickly detect anomalies in market prices and correct them.
- On the other hand, HFT may also be distorting price formation if it creates an incentive for natural liquidity to shift into dark pools as a way of avoiding transacting with ever-decreasing order sizes. But: no documented empirical evidence so far to support the possibility of this distortion.

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THE INVESTOR PRESPECTIVE

Issues of Fairness and Investor Protection

- Electronification of trading originally led to a democratization of exchange trading: retail investors benefitted from equally quick access to markets as professionals.
- However, special arrangements to cater for the needs of HFT (i.e. proximity and co-location services to reduce latency, special trade data feeds) give preference to those traders preference to those traders possibly harms long possibly harms long - term investors and market term investors and market quality.
- (Sub-penny) Arbitrage, where ATs and HFTs buy and sell stock purely to collect rebates, is often criticized as bringing no value to the retail / long-term investor. But: This provides liquidity ("artificial volume creation") that would otherwise not be available, easing the pressure of supply and demand.
- Spreads that have been narrowed (and are kept narrow) by HFTs benefit both retail and institutional investors.

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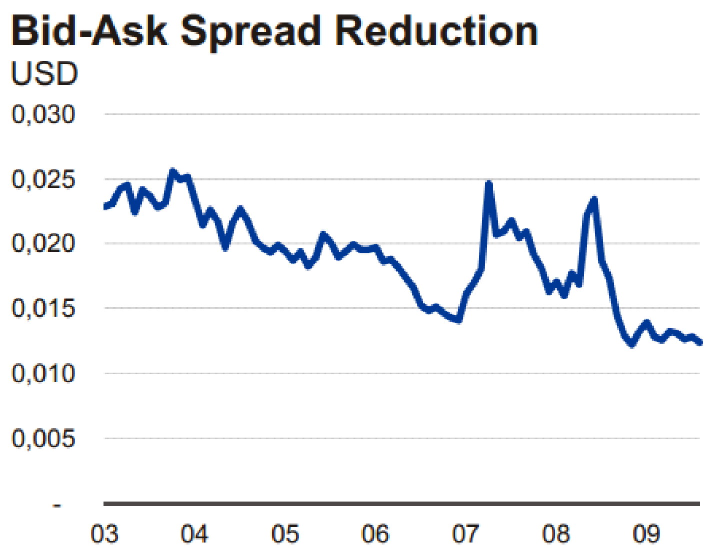

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REGULATORS' CONCERN

Risks for market integrity / confidence and systemic stability

- Market integrity could be endangered when technological advantage is misused for abusive tactics (e.g., by manipulating the price discovery process through excessive order entries and/or cancellations).

- Financial markets could become exposed to systemic risks as a result of technical vulnerability (malfunctioning algorithms), self-reinforcing strategies, and/or overload of technical systems and/or overload of technical systems.

- Numerous regulatory investigations and initiatives are under way:
  - SEC/CFTC: (Interim) SEC/CFTC: (Interim) "Market Event Report Market Event Report".
  - Netherlands Authority for the Financial Markets (AFM): HFT Report.
  - European Commission: Consultation to MiFID-Review.
  - ESMA: Consultation announced (summer 2011).
  - Working Groups at IOSCO, FSB, BIS, …

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HOW TO GURANTEE INTEGRITY AND MAINTAIN STABILITY?

Effectiveness of proposals put forward so far is unclear

- Some proposals are conducive to the regulators' objectives:
  - Risks controls (circuit breakers) to be adopted by trading venues provided they are properly calibrated in cooperation with market participants and consistent across venues.
  - Adoption of minimum tick sizes, calibrated by reference to price and levels of liquidity.
  - Co-location facilities to be made available on a non-discriminatory basis.

- Others are unrealistic and/or will be difficult to put into practice:
  - Artificially limiting execution speed on trading venues.
  - Imposing affirmative obligations (enforced market maker role)
  - Minimum life-time for quotes before they can be cancelled or modified.

- Regulations should not impair HFT's liquidity provision nor push HFT to other jurisdictions or OTC.

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