

Author(s), Title, Year	Data	Relevant findings
Anand, Tanggaard, Weaver, " Paying for Market Quality " (2009)	Swedish equities, 2002-2004	Designated market makers with affirmative obligations improve market quality, increase market valuation.
Bank for International Settlements, " High frequency trading in the foreign exchange market " (2011)	Foreign exchange, 2010 and 2011	"HFT has had a marked impact on the functioning of the FX market in ways that could be seen as beneficial in normal times, but also in ways that may be harmful to market functioning, particularly in times of market stress."
Bichetti, Maystre, " The synchronized and long-lasting structural change on commodity markets: evidence from high frequency data " (2012) (Added 3/2012)	U.S. futures and equities, 1997-2011	"This paper documented striking similarities in the evolution of the rolling correlations between the returns on several commodity futures and the ones on the US stock market, computed at high frequencies...we think that HFT strategies, in particular the trend-following ones, are playing a key role...commodity markets are more and more prone to events in global financial markets and likely to deviate from their fundamentals."
Boehmer, Fong, Wu, " International Evidence on Algorithmic Trading " (2012) (Added 3/2012)	Equities in 37 countries (excluding U.S.), 2001-2009	"Overall, our results show that algorithmic trading often improves liquidity, but this effect is smaller when market making is difficult and for low-priced or high-volatility stocks. It reverses for small cap stocks, where AT is associated with a decrease in liquidity. AT usually improves efficiency. The main costs associated with AT appear to be elevated levels of volatility. This effect prevails even for large market cap, high price, or low volatility stocks, but it is more pronounced in smaller, low price, or high volatility stocks."
Chae, Wang, " Determinants of Trading Profits: The Liquidity Provision Decision " (2009)	Taiwanese equities, 1997-2002	Absent mandatory obligations, market maker privileges don't induce market makers to provide liquidity; privileged but unconstrained market makers make profits when demanding liquidity in their own informed trades; unconstrained market makers are informed traders rather than liquidity providers in most scenarios.
Easley, Lopez del Prado, O'Hara, " The Microstructure of the Flash Crash " (2011)	U.S. futures, 2010	Unregulated or unconstrained HFT market makers can exacerbate price volatility when they dump inventory and withdraw, flash crashes will recur because of structural issues.
Egginton, Van Ness, Van Ness, " Quote Stuffing " (2012) (Added 3/2012)	U.S. equities, 2010	"We find that quote stuffing is pervasive with several hundred events occurring each trading day and that quote stuffing impacts over 74% of US listed equities during our sample period. Our results show that, in periods of intense quoting activity, stocks

		experience decreased liquidity, higher trading costs, and increased short-term volatility. Our results suggest that the HFT strategy of quote stuffing may exhibit some features that are criticized in the media."
Ferguson, Mann, " Execution Costs and Their Intraday Variation in Futures Markets " (2001)	U.S. futures, 1992	Unregulated or unconstrained market makers in the futures market have much more rapid inventory cycles than (regulated) equity market makers, are active rather than passive traders, and "actively trade for their own accounts, profiting from their privileged access..."
Frino, Forrest, Duffy, " Life in the pits: competitive market making and inventory control-further Australian evidence " (1999)	Australian futures, 1997	Unregulated or unconstrained market makers are not passive liquidity providers, they behave aggressively like informed traders.
Frino, Jarneic, " An empirical analysis of the supply of liquidity by locals in futures markets: Evidence from the Sydney Futures Exchange " (2000)	Australian futures, 1997	Unregulated or unconstrained market makers demand liquidity to profit from information advantages of privileged access, less likely to supply liquidity in volatile markets, almost as likely to demand as to supply liquidity.
Frino, Jarneic, Feletto, " Local Trader Profitability in Futures Markets: Liquidity and Position Taking Profits " (2009)	Australian futures, 1997	Unregulated or unconstrained market makers are active and informed traders.
Golub, Keane, " Mini Flash Crashes " (2011) (Added 3/2012)	U.S. equities, 2006-2010	"As soon as the [HFT] market maker's risk management limits are breached...the market maker has to stop providing liquidity and start to aggressively take liquidity, by selling back the shares bought moments earlier. This way they push the price further down and thus exaggerate the downward movement."
Hautsch, Huang, " On the Dark Side of the Market: Identifying and Analyzing Hidden Order Placements " (2012) (Added 3/2012)	U.S. equities, 2010	"Using data from the NASDAQ TotalView message stream allows us to retrieve information on hidden depth from one of the largest equity markets in the world."
Hirschey, " Do High-Frequency Traders Anticipate Buying and Selling Pressure? " (2011) (Added 3/2012)	U.S. equities, 2009	"HFTs' aggressive purchases predict future aggressive buying by non-HFTs, and their aggressive sales predict future aggressive selling by non-HFTs"; "These findings suggest HFTs trade on forecasted price changes caused by buying and selling pressure from traditional asset managers." The author writes that "On net, it is probable

		HFTs have a positive impact on market quality" because of tighter spreads; investment managers might disagree.
Johnson, Zhao, Hunsader, Meng, Ravindar, Carran, Tivnan, " Financial black swans driven by ultrafast machine ecology " (2012) (Added 3/2012)	U.S. equities, 2006-2011	The authors study "18,520 ultrafast black swan events that we have uncovered in stock-price movements between 2006 and 2011" and find "an abrupt system-wide transition from a mixed human-machine phase to a new all-machine phase characterized by frequent black swan events with ultrafast durations."
Joint CFTC-SEC Advisory Committee on Emerging Regulatory Issues, " Recommendations Regarding Regulatory Responses to the Market Events of May 6, 2010 " (2011)	U.S. futures and equities, 2010	"In the present environment, where high frequency and algorithmic trading predominate and where exchange competition has essentially eliminated rule-based market maker obligations, liquidity problems are an inherent difficulty that must be addressed. Indeed, even in the absence of extraordinary market events, limit order books can quickly empty and prices can crash simply due to the speed and numbers of orders flowing into the market and due to the ability to instantly cancel orders."
Kim, Murphy, " The Impact of High-Frequency Trading on Stock Market Liquidity Measures " (2011) (Added 3/2012)	U.S. equities, 1997-2009	Traditional market microstructure models have significantly underestimated market spreads in recent years. This is because of how trade sizes have decreased with the recent dominance of high frequency trading. When the authors correct for this they find that spreads have not decreased as much as HFT proponents believe.
Kirilenko, Samadi, Kyle, Tuzun, " The Flash Crash: The Impact of High Frequency Trading on an Electronic Market " (2010)	U.S. futures, 2010	Unregulated or unconstrained HFT market makers exacerbated price volatility in the Flash Crash, hot potato trading, two minute market maker inventory half-life; "...High Frequency Traders exhibit trading patterns inconsistent with the traditional definition of market making. Specifically, High Frequency Traders aggressively trade in the direction of price changes...when rebalancing their positions, High Frequency Traders may compete for liquidity and amplify price volatility."
Kurov, Lasser, " Price Dynamics in the Regular and E-Mini Futures Markets " (2004)	U.S. futures, 2001	Unregulated or unconstrained market makers demand liquidity to profit from information advantages of privileged access.
Linton, O'Hara, " The impact of computer trading on liquidity, price efficiency/ discovery and transaction costs " (2011)	Literature review and survey	"The nature of market making has changed, shifting from designated providers to opportunistic traders. High frequency traders now provide the bulk of liquidity, but their use of limited capital combined with ultra-fast speed creates the potential for periodic illiquidity"; in "regular market conditions,"

		liquidity has improved and transaction costs are lower.
Locke, Sarajoti, " Interdealer Trading in Futures Markets " (2004)	U.S. futures, 1995	Unregulated or unconstrained market makers demand liquidity to manage inventories.
Lyons, " A Simultaneous Trade Model of the Foreign Exchange Hot Potato " (1997)	Model derived from empirical studies of 1992 U.S. foreign exchange market.	Demonstrates hot potato trading among unregulated or unconstrained market makers. "Hot potato trading" means cascading inventory imbalances from market maker to market maker in response to a large order. Hot potato trading explains most of the volume in foreign exchange markets. Hot potato trading is not innocuous - it makes prices less informative.
Lyons, " Foreign exchange volume: Sound and fury signifying nothing? " (1996)	U.S. foreign exchange, 1992	Unregulated or unconstrained market makers cascade inventory imbalances from one to another, as "...trading begets trading. The trading begotten is relatively uninformative, arising from repeated passage of inventory imbalances among dealers...this could not arise under a specialist microstructure."
Manaster, Mann, " Life in the pits: competitive market making and inventory control " (1996)	U.S. futures, 1992	Unregulated or unconstrained market makers aggressively manage inventory, are "active profit-seeking," have much shorter inventory cycles than equities market makers.
Manaster, Mann, " Sources of Market Making Profits: Man Does Not Live by Spread Alone " (1999)	U.S. futures, 1992	Unregulated or unconstrained market makers demand liquidity to profit from information advantages of privileged access, are "predominant" informed traders.
McInish, Upson " Strategic Liquidity Supply in a Market with Fast and Slow Traders " (2012) (Added 3/2012)	U.S. equities, 2008	"We model and show empirically that latency differences allow fast liquidity suppliers to pick off slow liquidity demanders at prices inferior to the NBBO. This trading strategy is highly profitable for the fast traders."; "[O]ur research focuses on the ability of fast liquidity suppliers to use their speed advantage to the detriment of slow liquidity demanders, which we believe unambiguously lowers market quality. The ability of fast traders to take advantage of slow traders is exacerbated in the U.S. by the regulatory and market environment that we describe below."
Panayides, " Affirmative obligations and market making with inventory " (2007)	U.S. equities, 1991 and 2001	Mandatory market maker obligations reduce volatility.
Silber, " Marketmaker Behavior in an Auction Market: An Analysis of Scalpers in Futures Markets ", (1984)	U.S. futures, 1982-1983	Unregulated or unconstrained market makers profit from the information advantages of privileged access, two minute inventory cycles.

Smidt, " Trading Floor Practices on Futures and Securities Exchanges: Economics, Regulation, and Policy Issues " (1985)	Literature review and survey	On futures exchanges, inventory imbalances among unregulated or unconstrained market makers create "potentially unstable" markets and price overreactions during "scalper inventory liquidation."
United States Commodity Futures Trading Commission and Securities and Exchange Commission, " Findings Regarding the Market Events of May 6, 2010 " (2010)	U.S. futures and equities, 2010	Unregulated or unconstrained HFT market makers exacerbated price volatility in the Flash Crash, hot potato trading.
United States Federal Trade Commission, "Report of the Federal Trade Commission on the Grain Trade," Volume 7 (1926)	U.S. futures, 1915-1922	Unregulated or unconstrained market makers both cause and exacerbate price volatility; "The scalpers who operate with reference to fractional changes within the day may have a stabilizing effect on prices so far as such changes with the day are concerned, but when the market turns they run with it, and they may accentuate an upward or downward movement that is already considerable."
Van der Wel, Menkveld, Sarkar, " Are Market Makers Uninformed and Passive? Signing Trades in the Absence of Quotes " (2009)	U.S. futures, 1994-1997	Unregulated or unconstrained market makers demand liquidity for a substantial part of the day and are active and informed speculators.
Van Kervel, " Liquidity: What You See is What You Get? " (2012) (Added 3/2012)	U.K. equities, 2009	"We show that a specific type of high-frequency traders, those who operate like modern day market makers, might in fact cause a strong overestimation of liquidity aggregated across trading venues. The reason is that these market makers place duplicate limit orders on several venues, and after execution of one limit order they quickly cancel their outstanding limit orders on competing venues. As a result, a single trade on one venue is followed by reductions in liquidity on all other venues."
Venkataraman, Waisburd, " The Value of the Designated Market Maker " (2006)	French equities, 1995-1998	Designated market makers with affirmative obligations improve market quality, increase market valuation.
Wang, Chae, " Who Makes Markets? Do Dealers Provide or Take Liquidity? " (2003)	Taiwanese equities, 1997-2002	Absent mandatory obligations, market maker privileges don't induce market makers to provide liquidity; they derive profits from their own informed trades; "While dealers may be meant to perform the socially beneficial function of liquidity provision, the institutional advantages granted to them also give the ability to act as super-efficient proprietary traders if they choose to."

<p>Working, "Tests of a Theory Concerning Floor Trading on Commodity Exchanges" (1967)</p>	<p>U.S. futures, 1952</p>	<p>Unregulated or unconstrained market makers are also trend traders, profiting from the information advantages of privileged access; they can trade aggressively, especially when the market goes against the firm; inventory cycles of "minutes"; trend trading accelerates price changes (but may moderate extremes).</p>
<p>Zhang, "High-Frequency Trading, Stock Volatility and Price Discovery" (2010)</p> <p>(Added 3/2012)</p>	<p>U.S. equities, 1985-2009</p>	<p>"[H]igh-frequency trading may potentially have some harmful effects" because "high-frequency trading is positively correlated with stock price volatility."</p>
<p>Zigrand, Cliff, Hendershott, "Financial stability and computer based trading" (2011)</p>	<p>Literature review and survey</p>	<p>Self-reinforcing feedback loops in computer-based trading can lead to significant instability in financial markets; market participants become inured to excessive volatility in a cultural "normalization of deviance" until a large-scale failure occurs; research to date has not shown a persistent increase in market volatility, but HFT research is nascent.</p>