

WHAT HAMILTON HAS TO TEACH US ABOUT TODAY'S MARKETS



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*“Nasdaq’s streak of record highs has sucked investors into top names like Apple, Facebook and Amazon.com, making the technology-heavy index the **most crowded trade on the planet**...”*

CNBC, May 16, 2016.*

*“A trading position is said to become **‘crowded’** when it is held by a vast preponderance of investors. Such positions develop when investors become so convinced of the logic of the position and its likely success that they become complacent. Crowded trades are dangerous....”*

*Barron’s, March 15, 1999.***

By now, you’ve undoubtedly heard the expression that something is, or was, a “crowded trade.” Perhaps you’ve even used it to characterize an investment. The words “a crowded trade” conjure up a vivid image of hordes of investors crushed into an already packed space. Although colorful and evocative, the expression is both confusing and ill-defined. Not surprisingly, it’s been used to characterize a wide variety of phenomena from overpriced stocks to momentum crashes. This paper attempts to better define the expression “a crowded trade” via a simple allegory: Hamilton tickets.

Hamilton — Popular, but Uncrowded

Hamilton is a hit Broadway musical about the life and death of Alexander Hamilton, set to hip-hop. Tickets for each performance are limited. There is only one ticket for each of the 1,319 available seats. All tickets are held — either by the public, or by the theater box office. Savvy theater patrons and scalpers generally obtain tickets directly from the box office at face value — between \$179 and \$199 for most seats. Others, however, must turn to a secondary market for tickets. The play’s radical take on the Founding Fathers myth has been a smash hit, and tickets command an often sizable premium over face value (peaking at over \$1,900/ticket in mid-2016).¹ These are obtained via resales by original holders, or by speculators who bought them at lower prices.

Despite its popularity, Hamilton is never “crowded.” That’s because only ticket holders can enter the theater, and every ticket holder is assigned a seat. For Hamilton, at least, a high price doesn’t correlate with crowds.

Crowds and Yelling “Fire!”

So, under what circumstances could Hamilton actually be “crowded”? Suppose that the box office offered standing-room-only (SRO) tickets to all comers. Eager theater goers might potentially create a crush at the door in an attempt to see such a hot performance. Crowding in this sense can be a nuisance — confirmed ticket holders would need to elbow their way to their assigned seats. It also can be dangerous. Suppose that someone shouts “Fire!” during a performance. Unlike the underlying performance, where tickets limit audience size, there is not a separate price controlling access to the exit doors — it’s simply first to the door, first out. The exits may, or may not, have capacity for the entire audience to leave simultaneously, let alone one swelled past capacity with SRO attendees.

Although house rules and safety ordinances prevent this extreme scenario from becoming a reality, it’s helpful in illustrating an important point. Whether people are injured in a crush at the exits is heavily influenced by the number of people allowed in the theater, theater layout and, most importantly, the number and capacity of emergency doors relative to audience size. What is not a factor is the popularity of the show. Although Hamilton is Broadway’s hottest (and most expensive) ticket, less popular shows also play to full houses and could similarly experience a disorderly rush to the doors under the wrong circumstances. Ticket price does not determine whether an exit is chaotic.

An actual fire would likely close the theater — perhaps forever. Tickets for upcoming performances could become worthless. But

* www.cnbc.com/2017/05/16/tech-stocks-are-now-the-most-crowded-trade-on-the-planet.html

** A Crowded Trade. David Rucker. www.barrons.com/articles/SB921305086661751718

¹ See: <https://seatgeek.com/tba/articles/hamilton-ticket-prices-trends/>

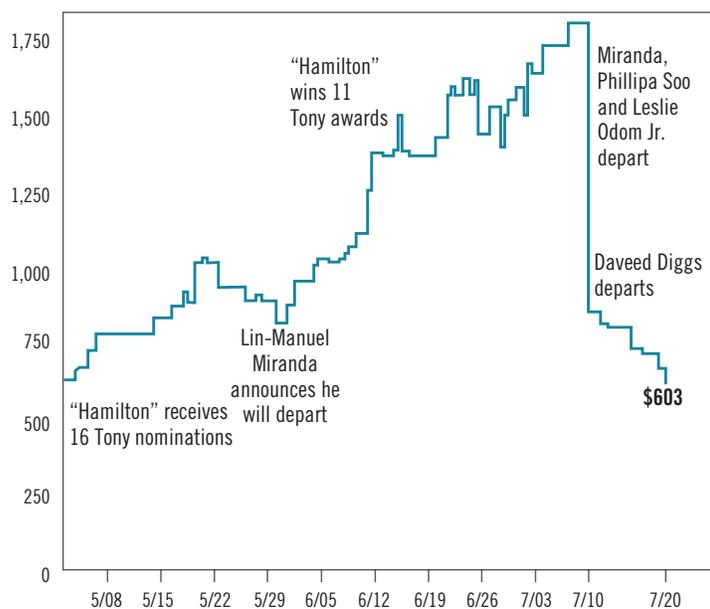
what happens if there is a false alarm? Although one performance is disrupted, subsequent shows go on. Ensuing performances should be routine, although some attendees may be more cognizant than usual of exit door proximity. Reports of injuries or other negative publicity surrounding the evacuation may cause some subsequent theatergoers to reassess their plans — putting downward pressure on resale prices. In short, things return to normal, but fear of a repeat occurrence may — or may not — loom large enough to depress the value of attending.

Popularity and Ticket Prices

Third-party prices for Hamilton tickets are high and, consequently, buying one for a future performance is risky. The show might unexpectedly close, performances may be cancelled, or key performers may become ill, or leave the show. Indeed, in early June 2016 Lin-Manuel Miranda (Hamilton's star and creator) along with other cast members announced that they were leaving the show on July 9.² As Figure 1 shows, resale ticket prices for near-term performances rose — peaking for Miranda's final show — but declined thereafter to pre-announcement levels. Essentially, this announcement conveyed news about a material change in the fundamental value of a ticket.

1/ Average Asking Price for Hamilton Tickets

Median seat prices calculated across three re-sellers — Stubhub.com, Ticketmaster.com, Seatgeek.com — as of the dates shown in 2016.



As of 7/30/2016.
Source: *The New York Times*,³ Stubhub.com, Ticketmaster.com, Seatgeek.com.

But did the dramatic change in the steep price for Hamilton tickets indicate that Hamilton was crowded? No. Material changes in the fundamental value of seeing a performance precipitated comparable changes in ticket prices. These changes were not associated with massive trading of tickets. In fact, this

announcement could have altered secondary-market asking prices without a single ticket changing hands.

Hamilton Tickets and Common Stocks

Now, consider common stocks. Like Hamilton, there are a fixed number of "tickets" — the outstanding shares for each company. The only way to acquire a share is to subscribe to an initial public offering, or to purchase it from a current shareholder. Regardless of popularity, an individual stock is unlikely to be "crowded" because, like seats for Hamilton, there are a fixed number of shares. If a stock becomes hot, like Hamilton tickets, its price rises until a potential buyer can tease out a share from a willing seller. With a few exceptions (discussed below), common stocks themselves are never crowded because all shares are held, and there must be a seller for every buyer.

In the stock market, trading is the equivalent of entering and leaving the performance. This distinction is important. Although Hamilton is, by definition, never crowded, people may start to bump into each other if enough attempt to come and go simultaneously. Put somewhat differently, the theater is never crowded, but the doors can be jammed if enough audience members decide to move. This situation — a collision of buyers and sellers — is what characterizes a crowded trade.

Standing-Room-Only Tickets and Short Selling

Short selling and certain derivative and other types of complex investment strategies are equivalent to offering unlimited SRO tickets for Hamilton. Consider short selling. The practice allows pessimistic investors to borrow shares to be sold in the anticipation that they can be repurchased and returned to the lender at a lower price in the future. Consequently, short selling enables more than one investor (both the short seller and the original holder) to have an economic claim on a single share of stock. Short sellers must meet margin requirements, and an unfavorable price movement can precipitate margin calls on behalf of the original holders and a rush to cover by the shorts. Such time-sensitive trading accompanying a short squeeze is indeed a crowded trade.

Certain derivative strategies can also create the potential for a crowded trade if they embody a need for immediate stock liquidity. For example, dynamic hedging (coined "portfolio insurance" in the parlance of the day) played a major role in the 1987 stock market crash, when vast waves of computerized selling of stock-related futures contracts dictated by the hedges caused the price of each constituent stock to plummet. Crowding occurred at the exits when the futures market was unable to provide the instantaneous liquidity required by the strategy.

All of this suggests that the search for potentially crowded trades should begin with a solid understanding of the episodic potential for trading to overwhelm available liquidity. Any mechanical strategy is a potential candidate for crowding. So are certain ETFs that offer the illusion of liquidity for an otherwise illiquid underlying investment (e.g., pockets of the small cap or emerging market universe, high-yield debt, and securities used to replicate movements in synthetic instruments like the VIX). Prices for such ETFs could nose-dive should enough investors simultaneously sour on prospects for the (illiquid) asset.

² First reported in the *New York Post* on June 2, 2016: nypost.com/2016/06/02/lin-manuel-miranda-is-leaving-hamilton/ and subsequently confirmed on June 16, 2016 that his final performance would be on July 9, 2016: www.nytimes.com/2016/06/17/theater/lin-manuel-miranda-confirms-hes-leaving-hamilton-on-july-9.html

³ "How Scalpers Make Their Millions with Hamilton," *The New York Times*, 7/30/2016.

Fire Sales

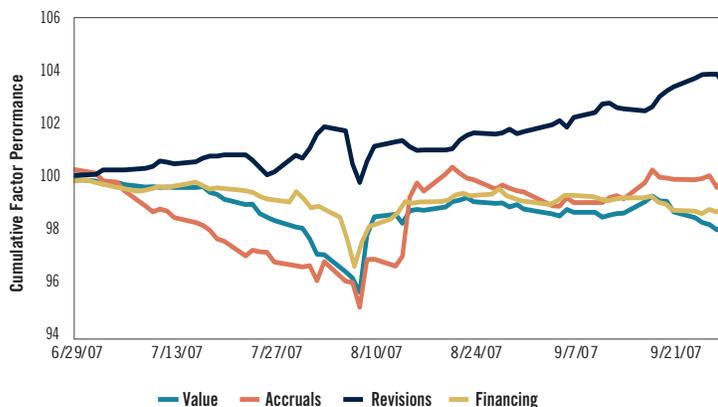
Theater fires are typically associated with unsafe conditions: overloaded electrical circuits, the presence of combustibles, open pyrotechnics. Casualties occur when a fire is associated with inadequate egress. The purpose of fire codes is to reduce the likelihood of fires and injuries.

In equities, the odds and consequences of a rush for the exits are exacerbated by the use of leverage, or by large positions that must be traded in a very short time frame regardless of market conditions. The ability to safely exit is determined by market depth and liquidity. Thin markets and wide bid-ask spreads warn of a potential crash should enough investors attempt to sell. Regulations (the markets' equivalent of fire codes) attempt to limit the individual use of leverage and require disclosure of short positions, but they may be inadequate.

The stock market's equivalent of yelling "Fire!" may be a poor earnings report, a product recall, or an unexpected legal or regulatory entanglement — any news that triggers a material change in investor expectations concerning future fundamentals. Regardless of a stock's initial popularity, really bad news may induce investors to simultaneously head for the exits. Those who are first out are better off than laggards who may get stuck.

Key here, however, is the understanding that whatever crash that results occurs on the way out, not the way in. Trades are transactions, and transactions become crowded whenever investors need to change their holdings, but can't do so easily. The governing principle is that popularity determines prices, while liquidity and the need for immediacy determines whether investors incur significant costs when attempting to unload their positions.

2/ A Crowded Trade: Quant Factor Returns around the 2007 "Quant Wreck"



As of 9/30/2007.

Source: QMA, Frank Russell Company.

Each line represents the payoff to an equal weighted long-short portfolio of the top minus bottom 1/3 of Russell 3000® Index stocks arrayed by factor exposure. Factor portfolios are hypothetical, are rebalanced monthly and exclude transactions costs. Russell® Indices are a trademark/service mark of the Frank Russell Company. Russell® is a trademark of the Frank Russell Company. Shown for illustrative purposes only. Past performance is not a guarantee or a reliable indicator of future results.

Crowding and Valuation Measure Different Things

Valuation measures whether an asset is expensive, or fully priced. Although expensive stocks tend to underperform, it is not because too many investors have somehow jumped on board. More likely, an expensive stock underperforms because the marginal investor has overestimated fundamentals, or underestimated risk. A reassessment of overoptimism can occur on a single trade, or via a mass exodus. The move from expensive to cheap may, or may not, be crowded. Not all expensive stocks underperform via a mass rush for the exits. Some do, but many don't, instead underperforming more gradually over time.

The Black Monday (October 19, 1987) stock market crash offers a good distinction between valuation and crowding. Stocks were expensive at the time, having climbed 44% between January and August of that year, and stretched valuations indeed suggested low prospective returns. But it would be silly to argue that the entire stock market was "crowded." Rather, the crash's root cause was a widely employed momentum strategy — one that embodied a need for immediate and unfettered liquidity in stock index futures contracts. Some very sophisticated investors failed to recognize the magnitude of assets employing the same algorithm or the potential for their collective actions to create a tsunami of trading in index-linked derivatives or how that would spill over into the market for the underlying stocks being traded. Simply put, the 1987 market crash did not occur because the market was overvalued, or because a majority of investors panicked and rushed to the exits. Rather, it occurred because a number of institutional investors swamped market liquidity by attempting to simultaneously liquidate an overwhelming number of stock index futures — trades that ultimately cascaded into the physical stock market.

Some might mistakenly argue that Facebook, Amazon and the other so-called "FAANG" stocks today potentially form a similarly crowded trade — after all, even after recent sell-offs their valuations may appear similarly stretched after a long interval of outperformance. Unlike 1987, however, the FAANG stock do not appear exposed to the conditions that create a crowded trade. There are no obvious signs of unusual leverage, massive positions in linked derivatives, or extensive short-selling — warning signs of potentially forced simultaneous selling. FAANG stocks may ultimately underperform because they are expensive, but it is unlikely that such underperformance will result from a chaotic rush to the exits.

Crowding and the Quant Wreck of August 2007

Just as a theater performance may be disrupted by someone falsely yelling "Fire!" so investors may experience disruptions that only appear to be valid warnings. For example, by the mid 2000s, quant investment strategies had experienced years of asset growth and by mid-2007 were increasingly utilized by institutional investors. However, in early August of that year, several highly levered, large institutional hedge funds experienced margin coverage problems, forcing rapid and cascading liquidations of stocks in their multi-factor quant portfolios. This became known as the August 2007 "Quant Wreck."⁴

As Figure 2 shows, these liquidations caused major quant factors to become highly correlated during the (margin-coverage driven) rush

⁴ See: Amir Khandani and Andrew Lo <http://alo.mit.edu/wp-content/uploads/2015/06/WhatHappenedQuants2007.pdf>

to the exits, especially on August 8. What many overlook is that the dive in factor performance completely reversed over the subsequent days. Unleveraged investors — those who sat on the sidelines and weren't required to trade during this interval — emerged unscathed.

Viewed in the context of our Hamilton heuristic, the 2007 Quant Wreck was a false alarm. There was no fire and, consequently, the sharp moves in factor prices associated with the rush to liquidity quickly reversed. Contrary to popular belief, the underlying problem wasn't quant "popularity," or that stocks favored by quant strategies had become crowded and expensive — indeed, conventional multi-factor quant always emphasizes cheap stocks. Rather, the abrupt and fleeting crash was the consequence of the unsound amounts of leverage employed by some investors who maintained positions in certain quant-favored securities that did not have the liquidity to accommodate the required trading.

Conclusions

This paper attempts to use Broadway's Hamilton musical to put some structure on the expression "a crowded trade." So, what do Hamilton tickets teach us?

First, semantics matter. The expression "a crowded trade" has become so ill-defined and so often misused that it has lost all meaning and virtually become a vague synonym for "bad."

Second, it is important recognize that valuation is normally distinct from crowdedness, *unless* high prices also correlate with an accompanying need by a number of investors to immediately vacate their positions at any cost.

Third, in much the same way that Hamilton ticket prices would revert to prior levels after a false fire alarm, investors can avoid harm associated with a crowded trade by simply staying put. There is no need to join the crowd unless there is a dramatic change in fundamentals. Investors did fine if they stayed the course after the 1987 market crash, or after the 2007 Quant Wreck. That said, investors who wish to avoid even the potential for a crowded trade should examine carefully whether an investment requires immediate and price-insensitive trading, whether the fundamental economic exposure is inherently illiquid (regardless of the investment instrument), and whether many other investors are in the same vehicle pursuing a strategy that might create a wave of simultaneous transactions.

Finally, when seeking to glean lessons from the past, it is as important to resist applying a broad brush to terms like "quant," "ETFs" and "computerized" as it is not to conflate "crowded" and "popular." The key is to be able to discriminate how each type and flavor of approach might help to minimize or amplify the structural and behavioral risks embedded in today's markets. If Hamilton teaches us anything, it's the tremendous value to be gained from a fresh and intimate look at history.

Well, provided you can afford a ticket.

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*As of 9/30/2018.

Notes to Disclosure

Sources: QMA, PGIM IAS, Datastream, eVestment, Bank of America Merrill Lynch, Goldman Sachs, JP Morgan.

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