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Crowding The Exits: Quantitative Equity Market Portfolio Endogeneity, and 13F Disclosure as Catalyst for Systemic Liquidity Shock and Contagion

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**CROWDING THE EXITS: Quantitative Equity Market Portfolio
Endogeneity, and 13F Disclosure as Catalyst for Systemic Liquidity
Shock and Contagion**

Wm. Evan Gorman

Abstract

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I. BACKGROUND

Systemic Risk can be generally defined as “the risk of a major and rapid disruption in one or more of the core functions of the financial system caused by the initial failure of one or more financial firms or a segment of the financial system. The potential for a shock to a specific financial firm transforming into an aggregate shock that affects the entire financial system is one useful way of thinking about systemic risk.”¹ Systemic risk is at its worst when unexpected shocks to the market happen due to unforeseen events, and when overlapping fund investment managers must react simultaneously to these shocks, the detriment to the system extends far beyond what anyone can comfortably predict.² Large funds, or common actions in the market by a group of funds, may cause changes in asset prices that are completely unreflective of market fundamentals.³ Furthermore, forced selling of assets may cause sharp price declines that have a domino or ripple effect upon other financial firms that are cyclical in nature.⁴

¹ LUDWIG CHINCARINI, *THE CRISIS OF CROWDING, QUANT COPYCATS, UGLY MODELS, AND THE NEW CRASH NORMAL 2* (Bloomberg Press, 1st ed. 2012) (“This permeative effect is the root notion of the concept of financial contagion.”).

² LLOYD DIXON ET AL., *HEDGE FUNDS AND SYSTEMIC RISK*, at xvi, Monograph (The Rand Corporation 2012) (“[Unforeseen events in 2008] created pressures on hedge funds to sell assets during the peak of the financial crisis, potentially contributing to the rapid decline in asset prices. Rapid declines in asset prices can create self-reinforcing cycles of margin calls, additional asset liquidations, and further price declines.”); *see* DAVID P. BELMONT, *MANAGING HEDGE FUND RISK AND FINANCING: ADAPTING TO A NEW ERA*, at 93 (John Wiley & Sons 2011).

³ DIXON ET AL., at 5.

⁴ *Id.*; Amir Khandani & Lo, Andrew, *What Happened to the Quants In August 2007? Evidence From Factors and Transactions Data*, *THE JOURNAL OF FINANCIAL MARKETS* 2 (2008).

This note does not argue that mandatory Regulatory 13(f) portfolio disclosure protects each funds' investors and the fund's individual trading strategy, but instead, argues the opposite: that the commonality of investment strategies is widespread, and the current disclosure regime gives ample opportunity to increase the number of investors using the same strategies. When successful investment managers file public Form 13Fs, their success can be copied by other managers and implemented in the market.⁵ This copycat strategy creates redundant portfolio holdings in the system, and the overlap of portfolio holdings only serves to exacerbate systemic risk.⁶

Part II of this note explains the applicability and relevance of Form 13F, and which investment managers must file. Part III details background information on types of quantitative investment strategies popular in the investment management community. Part IV Explains the risks to the system that are caused when institutional managers must disclose. Part V explains how those individual and singular risks can combine to form systemic catastrophe. Part VI offers enhanced confidential treatment of disclosures as a remedy for the issues at hand.

II. REGULATION 13(F) AND FORM 13(F) DISCLOSURES

1. Definitions/Applicability/Relevance

⁵ See discussion *infra*, Part IV.

⁶ DIXON ET AL., *supra* note 2, at xxiii (“[E]ven if no one hedge fund may be large enough to pose a systemic risk to the financial system, negative shocks can cause hedge funds as a group to unwind their positions at the same time, with ramifications cascading through the economy.”).

Rule 13(f)-1 outlines the necessary disclosure obligations of investment managers above a certain dollar threshold.⁷ These disclosures must be filed with the Securities and Exchange Commission through the Form 13F on a quarterly basis.⁸ At the close of each calendar quarter, filers have a permissible forty-five day window in which to timely file the Form 13F.⁹ The filings must include information about the specifics of the equities holdings and the type of discretion the managers have over investment decisions.¹⁰ Investment managers that have discretionary decision making authority pertaining to specific investment decisions are the reporting individuals, qualified by those with authority over \$100 million or more in equity securities holdings.¹¹ The regulation does not explicitly define the institutions that are subject to the regulation, but instead applies to the broad variety of investment managers that meet the simple criteria.¹² While the 13F reports are made public, the next section details the confidential treatment that can be afforded to managers that qualify, with particular respect to investment managers in the hedge fund context.¹³

A. Hedge Funds

⁷ 17 C.F.R. § 204.13f-(1)(a)(1)

⁸ *Id.*

⁹ 17 C.F.R. § 204.13f-(1)(c)

¹⁰ Thomas P. Lemke & Gerald T. Lins, *Disclosure of Equity Holdings by Institutional Investment Managers: An Analysis of Section 13 (F) of the Securities Exchange Act of 1934*, 43 BUS. LAW. 93, 94 (1987).

¹¹ 17 C.F.R. § 204.13f-(1)(b); Lemke & Lins, *supra* note 10 at 103 (explaining precisely the definition of discretionary decision making).

¹² Lemke & Lins, *supra* note 10, at 93-94 (“This reporting threshold encompasses many types of institutional managers such as banks, investment companies, pension funds, insurance companies, and brokerage houses.”).

¹³ 13F filings can be found at the SEC’s Edgar Database website, *available at* <https://www.sec.gov/edgar/searchedgar/companysearch.html> (last visited March 27, 2016).

It is difficult to precisely define what a hedge fund is because the term covers a vast array of different investment vehicles.¹⁴ Hedge funds comprise a class of Alternative Investment vehicles, with distinct limitations on the qualifications and number of investors, as well as how those investors can be solicited and retained.¹⁵ Similarly, most hedge funds are characterized by limitations on investor redemptions, return benchmarks correlated to management fees, and broad management discretion over investment decision.¹⁶ By 2010, the US Government Accountability Office reported the number of hedge funds to be approximately 9,500 with \$2.4 trillion in assets under management.¹⁷

Outside of these criteria, hedge funds can exercise broad leeway in the investment strategies and asset classes they are permitted to employ.¹⁸ This complete freedom in investment discretion distinguishes hedge funds from other types of asset management vehicles, and many hedge funds are often significant investors in certain markets and active traders in many markets.¹⁹ The strategies that generally characterize hedge funds are the use of both “long” and “short” positions, the employment of leverage, the use of derivative instruments, and the limited disclosure of proprietary strategies.²⁰ However,

¹⁴ RICHARD BOOKSTABER, *A DEMON OF OUR OWN DESIGN: MARKETS, HEDGE FUNDS, AND THE PERILS OF FINANCIAL INNOVATION* 243-249 (John Wiley & Sons, Inc., 1st ed. 2007).

¹⁵ DIXON ET AL., *supra* note 2, at xiv.

¹⁶ *Id.*; *See also* ANDREW LO, *HEDGE FUNDS* at 3 (John Wiley & Sons, Inc., 1st ed. 2012) (explaining the enormous flexibility that managers have in pursuing alpha).

¹⁷ LO, *supra* note 16, at 2.

¹⁸ BOOKSTABER, *supra* note 14, at 243; *see also* LO, *supra* note 15, at 3.

¹⁹ DIXON ET AL., *supra* note 2, at 5; Itzhak Ben-David et al., *The Behavior of Hedge Funds During Liquidity Crises* at 5 (Ohio State University, Charles A Dice Center for Research in Financial Economics, 2010). David Easley et al., *Opaque Trading, Disclosure, and Asset Prices: Implications for Hedge Fund Regulation*, 27 *REVIEW OF FINANCIAL STUDIES* 1190 (2014).

²⁰ DIXON ET AL., *supra* note 2, at xiv.

these attributes are what distinguish hedge funds from more regulated managers such as Mutual Funds, Index Funds and Pension Funds.²¹

1. Confidentiality Provisions

Investment managers can request confidential status on their Form 13F upon filing.²² This confidential status is permitted pursuant to Exchange Act Rule 24b-2.²³ The Form 13F provides the exact specifics of what details and explanations must be filed, along with the nine criteria that can permissibly be granted confidential status.²⁴ While the instructions and qualifications are seemingly simple and explicit, investment managers have often decried that the burden imposed by the SEC is too high and that the standards are almost impossible to meet.²⁵ Investment managers are vocal in the harm that public disclosure can cause to the industry, the proprietariness of the investment strategies employed, and the resulting danger to the system; with one prominent manager going to far as to say disclosure is “akin to asking Coca-Cola to disclose their secret formula.”²⁶ The predominant view is that investment strategies constitute trade secrets and proprietary intellectual property.²⁷ When disclosed, the astute investor can discern

²¹ Id.

²² Form 13F.

²³ Edward Pekarek, *Hogging the Hedge, Bulldog's 13F Theory May Not Be So Lucky*, 12 FORDHAM J. CORP. & FIN. L. 1079 (2007).

²⁴ Form 13F.

²⁵ James Robertson, *Hedge Funds and Public Disclosure Requirements, Is the SEC Telling Secrets?*, 8 NE. L.J. 787, at (2008).

²⁶ Hedge Fund Regulation, Fund Managers Panel, Hearing Before the H. Oversight and Government Reform Comm., 110th Cong. 2 (November 13, 2008), (statement of Clifford Asness, at 47 min).

²⁷ Pekarek, *supra* note 23, at; accord Robertson, *supra* note 25, at; See also, Erin Martin, *The Intersection Between Finance and Intellectual Property: Trade Secrets, Hedge Funds, and Section 13(F) of the Exchange Act*, 53 N.Y.L. SCH. L. REV. 575 (2008); LO at 2.

the nature of the strategy by examining the portfolio holdings, and reverse engineer those strategies to create copycat or “clone” funds.²⁸

III. QUANTITATIVE EQUITY STRATEGIES DETAILED

Form 13(f) applies specifically to “discretionary investment managers.”

Discretionary investment managers are a diverse group.²⁹ In general, discretionary investment managers engage in proprietary trading and have discretionary decision making powers based on history, intuition, strategy, training and personal experience.³⁰ That discretion extends to the types of strategies detailed in the next section. The focus of the discussion in this note is centered around Quantitative based investment strategies, or those that implement Quantitative Finance Theory to structure investments (colloquially referred to as “Quant” for short). Quant trading strategies implement diverse theories across academic disciplines, as well as proprietary combinations of various academia and traditional trading strategies, to build explicit trading rules and parameters to implement systematically across markets.³¹

²⁸ See discussion *infra*, part IV.

²⁹ See *supra* note 11.

³⁰ Lasse Heje Pedersen, *When Everyone Runs for the Exit*, at 184 (National Bureau of Economic Research 2009).

³¹ *Id.* (“Quants define the trading rules explicitly and build systems that implement them systematically. They try to develop a small edge on each of many small diversified trades using sophisticated processing of ideas that cannot be easily processed using non-quantitative methods. To do this, they use tools and insights from economics, finance, statistics, math, computer science, and engineering, combined with lots of data (public and proprietary) to identify relationships that market participants may not have incorporated in the price immediately. They build computer systems that generate trading signals based on these relationships, perform portfolio optimization in light of trading costs, and trade using automated execution schemes that route hundreds of orders every few seconds. In other words, trading is done by feeding data into computers that run various programs with human oversight.”).

Quantitative strategies can be broken down into simplified categories based on a number of parameters, and the combination of parameters defines any particular investment manager’s discretionary style or styles.³² The Center for International Securities and Derivatives Markets uses an exhaustive list to classify fund strategies.³³ However, these classifications are better attributed to specific asset class strategies instead of the broader classifications of strategies generally (because strategies can be applied across asset classes). The focus of this note is limited to Quantitative strategies themselves, regardless of the asset class. In particular, the focus of this note revolves around quantitative trading strategies with effects in the equity markets, under simplified and generalized assumptions.³⁴ This section details a number of the strategies as background.

A. Fundamental Assumptions

The tenants of contemporary finance theory extend far beyond the scope of the discussion in this note, but the essentials are worth mentioning. Starting with Eugene Fama’s Efficient Market Hypothesis (EMH), the most basic premise of market efficiency states that share prices reflect all available information about a given stock and, therefore,

³² Douglas Cumming & Sophia Johan, *Symposium Article: Hedge Fund Forum Shopping*, 10 U. PA. J. BUS. & EMP. L. 783, 787 (2008) (“Hedge funds engage in a variety of investment activities. . . . [Compared to other investment vehicles] the hedge fund is the most autonomous in its ability to implement its rather innovative investment strategies.”); *see also* BOOKSTABER, at 245-246.

³³ Cumming & Johan at 807-808. (“The Center for International Securities and Derivatives Markets (‘CCISDM’) records styles for Merger Arbitrage, Equity Long/Short, Relative Value Multi-Strategy, Emerging Markets, Equity Market Neutral, Multi-Strategy, Convertible Arbitrage, Global Macro, Fixed Income, Fixed Income Arbitrage, Technology Sector, Event Driven Multi Strategy, Distressed Securities, Option Arbitrage, Capital Structure Arbitrage, Market Timing, Short Bias, Equity Long Only, Regulation D, Other Relative Value and Other Strategy.”).

³⁴ PEDERSEN, at ; LO

the price of that stock is accurate.³⁵ When new information enters the market, prices change almost instantaneously to reflect that new information.³⁶ This can be further broken down into the three current variations of the EMH: (1) Weak; (2) Semi-Strong; and (3) Strong.³⁷ The Weak form of the EMH states that a stock's price is substantially independent of past price performance.³⁸ Historic price information is, thus, reflected in the current price, so investors can derive no benefit from analyzing successive historic prices.³⁹

The Semi-strong EMH postulates an intermediate step, namely that current prices are only a reflection of public knowledge about a security.⁴⁰ Since that knowledge is public, an investor's efforts to acquire and analyze superior amounts of public information cannot be expected to produce superior investment results.⁴¹ The Strongest form of the EMH is the logical extreme. It posits that stock price reflects all public and private information about that security. If all information is reflected in the price, it is therefore impossible for an investor to systematically outperform the stock market.⁴² Since all information is taken into account, stock prices will therefore move in a completely random walk, with past prices having no bearing on future prices.⁴³ However, as is laid out subsequently, EMH proves problematic in a real world application because

³⁵JOHN MACY, INTRODUCTION TO MODERN FINANCIAL THEORY at 38

³⁶Id.

³⁷Id.

³⁸MACY, at 39

³⁹ Id.

⁴⁰ Id.

⁴¹ Id.

⁴² Id.; *But see also*, Jack SCHWAGER, MARKET SENSE AND NONSENSE, HOW THE MARKETS REALLY WORK (AND HOW THEY DON'T) at 13-14 (John Wiley & Sons, Inc., 1st ed. 2013).

⁴³ Id.

there are frictions and inefficiencies.⁴⁴ Those frictions and inefficiencies have produced further theories as to price movement, and these inefficiencies are what sophisticated investors are seeking to exploit.⁴⁵

Quantitative investment managers reject that markets can be absolutely and perfectly efficient.⁴⁶ Instead, Quants seek to exploit temporary inefficiencies and price anomalies resulting from less than perfectly efficient markets.⁴⁷

Investment managers can further be categorized by parameters such as their time horizon for trade executions and investment holding period.⁴⁸ When predictive modeling through complex algorithms notices price anomalies regarding specific securities, these signals can be quickly arbitrated out of the market, bringing the price back to its true value.⁴⁹ From a quantitative perspective, these strategies are constructed to be market neutral, meaning that they can profit no matter which direction the market swings, positively or negatively.⁵⁰

However, the fundamental assumptions and investment strategies, particularly those espoused by pure Quants, showed a significant degree of overlap in their theories.⁵¹ Quant finance and an industry “of shared ideas because academics will publish studies of price anomalies and will circulate them among the investment community. The

⁴⁴ Id.

⁴⁵ Id.

⁴⁶ BRIAN BROWN, CHASING THE SAME SIGNALS, HOW BLACK-BOX TRADING INFLUENCES MARKETS FROM WALL STREET TO SHANGHAI, at 53 (John Wiley & Sons, Inc. 2010).; See Daniel, *infra* note 52, at 20.

⁴⁷ BROWN, at 41.

⁴⁸ Daniel, at 12; BROWN, *supra* note 46, at 145; BELMONT, *supra* note 2, at 91.

⁴⁹ LO, *supra* note 16, at 26.; Cahan & Yuo, *infra* note 92, at 1; BELMONT, *supra* note 2, at 185.

⁵⁰ BROWN, *supra* note 46, at 78, 81; Khandani & Lo, *supra* note 4, at 2.

⁵¹ BROWN, *supra* note 46, at 164-165; See *Quantcentration: Implications for Quantitative Equity Investing* (Quantitative Investment Strategies: Equity, Goldman Sachs Asset Management), Mar. 2008, at 1

interesting ideas . . . will get digested throughout the industry and get implemented by many different firms, although in slightly differentiated forms.”⁵² While the potential for investment opportunity has expanded, fundamental assumptions have remained the same.

B. Black Box Trading

As the previous sections details, the contemporary investment theory relies on a specific set of underlying assumptions. Quantitative Finance has taken these fundamentals, and applying theory with faster and more powerful computers, seen unprecedented expansion in all aspects of investment strategy capacity.⁵³ Technology has expanded the capacity of data gathering and trade execution to level that is nearly impossible for humans to do unaided.⁵⁴ Firms expend significant resources to gain faster access to data, then organize and store that data; some firms employing hundreds of people for just that purpose.⁵⁵ The trade execution speed, the volume of portfolio turnover rates, and quantity securities involved in a strategy is a direct result of modern technological advances.⁵⁶

Colloquially known as “Black Box” trading, there is no precision definition of what constitutes a “Black Box,” computer-drive quantitative investment strategy.⁵⁷ The

⁵² BROWN, at 164-165.

⁵³ LO, *supra* note 16, at 264; BELMONT, *supra* note 2, at 215.

⁵⁴ LO, at 264.

⁵⁵ NARANG, at 135; BROWN, *supra* note 50, at 10-11.

⁵⁶ LO, *supra* note 16, at 264; NARANG, at 117; *But see also*, Lin, *New Finance* at 581. (“The accelerated speed of cyborg finance means faster executions, faster market-making, and faster profits. But the accelerated speed also means faster ascents and faster crashes at speeds previously unattainable, posing challenges previously unimaginable.”); BELMONT, *supra* note 2, at 216.

⁵⁷ BROWN, *supra* note 46, at 9. (“A formal definition of ‘black-box strategy’ would be any trading system that relies on an empirical model to generate the timing and quantity of investment decisions. The prerequisite for the black-box description is automation through computerized trading algorithms.”); *See also*,

analogy of the Black Box pertains to the mystery surrounding how specific inputs are converted into their relevant outputs.⁵⁸ The most simplistic and formal definition is that a Black Box strategy is a trading system that relies on empirical models and computers to make decisions about the timing and quantity of trades and investments.⁵⁹ Beyond the implementation of the strategy, each Black Box strategy is engineered according to the risk preferences and investment objectives of the designer.⁶⁰ Inherent in that design are the input triggers, or “signals,” that the models are making active decisions in response to.⁶¹

However defined, quantitative investment managers are notoriously secretive and protective of their alpha-generating strategies.⁶² Alpha (“ α ”) is the secret magic that all investment managers seek; it is an individual manager’s returns in excess of the market

Lin, *New Finance* at 574-575. (“In terms of trading, the emergence of computerization and artificial intelligence has led to the rise of black-box or algorithmic trading, which refers to the use of incredibly powerful computers to analyze and execute trading opportunities based on complex mathematical models. In the age of cy-fi, almost every financial institution with significant capital employs some form of algorithmic trading. These programs frequently operate exclusively on artificial intelligence, devoid of human input after initial installation. These programs can process massive amounts of information, spot trends, and allocate capital accordingly within seconds. In fact, some programs are so advanced that within fractions of seconds of a securities filing or news report, the programs can ‘read’ them and execute trades based on the new information without any human assistance. In the new financial industry, decisions that previously took hours or minutes to analyze and execute by numerous teams of individuals now take only seconds by a single computer.”); BELMONT, *supra* note 2, at 236, n. 23.

⁵⁸ BROWN, *supra* note 46, at 9.; Pedersen, *supra* note 29, at 185.; BELMONT, at 215.

⁵⁹ BROWN, at 32, 133.

⁶⁰ BROWN, at 19; Daniel, *supra* note 48, at 11; David Easley et al., *Opaque Trading, Disclosure, and Asset Prices: Implications for Hedge Fund Regulation*, 27 REVIEW OF FINANCIAL STUDIES 1190 (2014).

⁶¹ BROWN, at 19.

⁶² BROWN, at 9. (“A formal definition of ‘black-box strategy’ would be any trading system that relies on an empirical model to generate the timing and quantity of investment decisions. The pre-requisite for the black-box description is automation through computerized trading algorithms.”).

overall.⁶³ When one finds a way to generate Alpha, it must be jealously guarded.⁶⁴ Alpha is the measure that can make or break an investment manager, and it can slingshot an investment strategy to rockstar status or straight to the graveyard.⁶⁵ Developing an alpha strategy that can consistently beat the market is no easy task, so quantitative execution strategies are proprietary and often deemed trade secrets.⁶⁶ Disclosure of any proprietary strategy information contrary to the interests of investors and shareholders, and directly a violation of the manager's duty as a fiduciary.⁶⁷ As trade secrets, proprietary strategies are guarded with a secrecy and protection that borders on paranoia.⁶⁸ While alpha-drive returns may distinguish manager as individuals, it is more difficult to distinguish them based on style alone because of the increased numbers of multi-strategy investment managers.⁶⁹ The next section addresses a surface level assessment of Quant Equity investment strategies.

C. An Overview of Specific Quantitative Strategies

⁶³ Pederson, at 28. ("Expected return in excess of the risk free rate and the exposure to market is given by the Alpha, α ."); NARANG at 23-24; *but see also*, Martin, *supra* note 26 at 592; BELMONT, *supra* note 2, at 216.

⁶⁴ LO, *supra* note 15, at 9; Martin, at 592; BELMONT, *supra* note 2, at 52.

⁶⁵ PEDERSEN, at 28. ("Alpha is clearly the sexiest term in the regression: It is the Holy Grail all active managers seek. Alpha measures the strategy's value added above and beyond the market exposure due to the hedge fund's trading skill (or luck, given that alpha is estimated based on realized returns.)").

⁶⁶ Asness, Congressional testimony, *supra* note 26; LO, *supra* note 15, at 2. ("[M]any experts in intellectual property law would certainly classify trading strategies, algorithms, and their software manifestations as intellectual property which, in some cases, are patentable. However, most hedge fund managers today (and, therefore, most investors) have not elected to protect such intellectual property through patents but have chosen instead to keep them as 'trade secrets,' purposely limiting access to these ideas ever within their own organizations. As a result, the departure of key personnel from a hedge fund often causes the demise of the fund."); BELMONT, *supra* note 2, at 216.

⁶⁷ LO, at 259; BOOKSTABER, *supra* note 14, at 201; *See also*, David Easley et al., *supra* note 65, at 1190.

⁶⁸ LO, at 9; LO, at 3, n. 1; *See also*, *Quantcentration*, *supra* note 56, at 13; Robertson, *supra* note 25, at 794;

⁶⁹ Ben-David et al., *infra* note 162, at 5; Brunnermeier & Pedersen, *infra* note 82, at 5.

A Price Anomaly is “an irregularity or deviation from historical norms that recurs in a data series.”⁷⁰ What makes it anomalous is the fact that is by definition irregular.⁷¹ Detecting these irregularities allows the Quantitative investor to discern patterns in the prices of securities; successful exploitation of those patterns can generate returns, or alpha, above market returns.⁷² Any data that can be studied will be studied in order to find original patterns.⁷³ This runs some risk of over collecting data, or over-fitting models to find patterns in noise that don’t actually exist.⁷⁴ As technology has gotten faster and more capable, Quants can now study market data in millisecond increments, trade by trade or tick by tick.⁷⁵ In these increments, computers can identify temporary imbalances in supply and demand for a security and profit from them.⁷⁶ Price anomalies become trading signals when they are statistically significant deviations from the norm that will be corrected.⁷⁷ Some common indicators that can be used as input signals are price volatility, bid-ask spread and trade volume.⁷⁸

1. Market Neutral

Funds that seek market neutrality are seeking to balance their portfolios, often using long positions to offset short positions, so that the fund can generate profitable

⁷⁰BROWN, *supra* note 46, at 12.

⁷¹ *Id.*, at 15.

⁷² *Id.*; BELMONT, *supra* note 2, at 91, 215

⁷³ *Id.*

⁷⁴ RISHI NARANG, *INSIDE THE BLACK BOX: A SIMPLE GUIDE TO QUANTITATIVE AND HIGH-FREQUENCY TRADING*, at 28, 139-144 (John Wiley & Sons, Inc., 2nd ed. 2012).

⁷⁵ BROWN, *supra* note 46, at 12, 27, 63.

⁷⁶ BROWN at 14, 41, 54; M.K. Brunnermeier & L.H. Pedersen, *Market Liquidity and Funding Liquidity*, 22 *REVIEW OF FINANCIAL STUDIES* 2201 (2009).

⁷⁷ BROWN at 14.

⁷⁸ *Id.*

returns regardless of which direction the market moves.⁷⁹ The portfolio is constructed to be “neutral” in dollar terms, with equally weighted long and short positions offsetting each other.⁸⁰ Arguably the truest definition of a Hedge, Market Neutral positions bet on the market moving in both directions, and stand to gain profits from all movement.⁸¹ Market Neutral funds are notable because they can generate profits even while the entire market collapses overall.⁸²

Strategies extend beyond holding portfolios equally weighted in long and short positions.⁸³ Often these portfolios consist of hundreds or thousands of stocks.⁸⁴ For a strategy to be profitable, gains must simply exceed hedged losses; when this approach is applied on a large scale, incremental gains can accumulate quickly, regardless of the market environment.⁸⁵

2. Statistical Arbitrage

One of the most common Quant Strategies is Statistical Arbitrage (“Stat Arb”), or Price-Mean Reversion.⁸⁶ Stat Arb is a directional, trend following strategy that seeks to

⁷⁹ BROWN, at 76; BELMONT, *supra* note 2, at 185.

⁸⁰ Equal weighting offers protection against adverse movements and market corrections. BROWN at 76.

⁸¹ BROWN, at 76-78; BELMONT, *supra* note 2, at 186.

⁸² *Id.*

⁸³ *Id.*, at 10.

⁸⁴ *Id.*, at 77; DIXON ET. AL, *supra* note 2, at 25.

⁸⁵ BROWN, *supra* note 46, at 81.

⁸⁶ BROWN at 9, (“[Statistical Arbitrage] models attempt to exploit price anomalies in correlated securities. They typically are nondirectional [sic] (therefore the term arbitrage[sic]) in that they buy one security and sell another, hoping to profit on the difference between the price margins of the directional positions.”); *See also*, NARANG at 31, 33, (“The Theory behind mean reversion strategies is that there exists a center of gravity around which prices fluctuate, and it is possible to identify both this center of gravity and what fluctuation is sufficient to warrant making a trade. . . . [This capitalizes] short-term imbalances among buyers and sellers due simply to liquidity requirements that lead to an instrument being over-bought or over-sold.”).

anticipate the future momentum of stock prices.⁸⁷ Statistical Arbitrage measures temporary imbalances in the order book, or a mismatch of the number of buyers and the number of sellers of a security, and anticipates that prices will return to their historical mean when balance is restored.⁸⁸ The most common notion of Stat Arb seeks to exploit anomalies in the price differences between two correlated securities.⁸⁹ Mean reversion strategies can commonly be thought of as two, single equities that should correlate, but are temporarily uncorrelated.⁹⁰ Stat Arb strategies buy the security deemed undervalued, while simultaneously shorting the corresponding security that is overvalued.⁹¹ These opportunities arise when two securities that should be priced with an expected correlation, but due to temporary anomalies in the market, the prices have diverged from their equilibrium correlation.⁹²

A classic Stat Arb example would involve two similar securities, such as Coke and Pepsi or General Motors and Chrysler.⁹³ Stat Arb strategies monitor the margin of difference between the prices of the securities.⁹⁴ If that margin increases or decreases to a statistically significant deviation from the mean of the historical margin, a Stat Arb strategy will take action by betting that the prices will revert to the historical mean once

⁸⁷ BROWN, at 56; BELMONT, *supra* note 2, at 186-187.

⁸⁸ BROWN, at 54.

⁸⁹ *Id.*

⁹⁰ BROWN, *supra* note 46, at 10; *See also* LO, *supra* note 16, at 4 (“It is one of the great lessons of modern finance that mean-variance optimization yields benefits through diversification, the ability to lower volatility for a given level of expected return by combing securities that are not perfectly correlated. But what is the securities are hedge funds, and which if their correlations change over time.”).

⁹¹ BROWN at 9.

⁹² *Id.*

⁹³ BROWN, at 56.

⁹⁴ *Id.*

the anomaly has been corrected.⁹⁵ The time horizon for Stat Arb can range from a few seconds to several months.⁹⁶

IV. COMPETITIVE INVESTOR PHENOMENON RESULTING FROM PUBLIC DISCLOSURE

A. Systemic Risk As a Result of Disclosure

Quarterly disclosure places portfolio holdings in the public domain, accessible by anyone through the Commission's EDGAR filing database.⁹⁷ When portfolio structure and specific equity holdings are made public, Quant funds are tipping their hands by revealing pieces of their proprietary strategies and alpha generating techniques.⁹⁸ For Long Short funds, public disclosure reveals their sentiments on individual companies, industries, sectors, instruments and the global economy as whole.⁹⁹ Any correlated equities correspond to a relationship the fund is seeking to exploit for gain. Thus, their proprietary strategies are made public knowledge, and the reasons for the specific holdings can be readily discerned by the astute investor.¹⁰⁰

This disclosure creates a severe risk of copy cats of all varieties: from new investment managers and new funds seeking to emulate, if not completely duplicate,

⁹⁵ Critical to successful intraday statistical arbitrage is being able to distinguish noise trading from "informed" trading. BROWN at 57.

⁹⁶ NARANG, at 31; *See also*, Pedersen, *supra* note 29, at 185.

⁹⁷ 13F filings can be found at the SEC's Edgar Database website, *available at* <https://www.sec.gov/edgar/searchedgar/companysearch.html> (last visited March 27, 2016).

⁹⁸ LO, *supra* note 16, at 121; Easley et al., *supra* note 65, at 1191.

⁹⁹ Martin, *supra* note 26, at 592.

¹⁰⁰ Easley et al., *supra* note 65, at 1191.

successful tactical strategies, to established industry players seeking to expand the scope and size of their own funds both inside and outside of their tradition asset class strategy.¹⁰¹ For fund managers that already hold substantial assets, this copy-cat expansion can mean venturing into new markets and asset classes, or doubling down on already implemented equities-based strategies using amplified leverage.¹⁰²

This note has thus far attempted to demonstrate said underpinnings. This note further argues that 13(f) disclosures are problematic for a number of reasons, and the risks associated with disclosure create substantial systemic risk, arguably in excess of their substantive merit.¹⁰³ The following sections contain an overview of the risks inherent with public disclosure. These sections simply define the phenomena that occur when multiple investors pursue the same strategy.¹⁰⁴ The risks this note identifies are, respectively, Clone Fund Risk, Copycats, The Crowded Trade Effect, The Decay Effect, Leverage and Style Drift. After these risks have been defined, the effect they have on the financial system and the practical outcomes from unexpected events are explained in the section that follows.

B. Clone Funds

When portfolio positions are disclosed publicly, that information creates an additional data set that other investment managers can use to compare their own

¹⁰¹ Daniel, *supra* note 52, at 11.

¹⁰² When investment managers begin cannibalizing each others' profits, they must increase leverage to attain historical returns. BROWN, *supra* note 50, at 166; LO, *supra* note 15, at 218.

¹⁰³ LO, at 211.

¹⁰⁴ Pedersen, *supra* note 29, at 184.; Easley et al., *supra* note 94, at 1191.

strategies.¹⁰⁵ Using sophisticated computers and common risk factors, sophisticated investment managers can replicate the portfolio returns of other active managers.¹⁰⁶ Investment managers can thus create “clones” that replicate specific fund characteristics.¹⁰⁷ The simplest clone is a low-cost passive portfolio subject to similar risk exposures.¹⁰⁸ The ease of cloning depends on to what degree a specific fund’s return is driven by common risk factors versus manager-specific alpha; the former being easier to clone while the latter being more difficult.¹⁰⁹ However, linear clones based on common risk metrics can generate returns similar to the funds on which they are based, meaning that “hedge fund replication, at least for certain types of funds, is both possible and, in some cases, worthy of serious consideration.”¹¹⁰ Complex cloning is still in its infancy with financial engineering academics.¹¹¹ But, experts have shown it is possible to achieve comparable returns to actual funds using a cloning process that “reverse-engineers a hedge fund’s proprietary trading strategy, thereby profiting from the fund’s intellectual property.”¹¹²

C. The Crowded Trade

¹⁰⁵ LO, at 121.

¹⁰⁶ Id.

¹⁰⁷ Id. Id; Ben-David et al., *supra* note 42, at 7.

¹⁰⁸ Id., at 121-122.

¹⁰⁹ Id.

¹¹⁰ The strategies that can be cloned most precisely are Equity Market Neutral, Global Marco, Long/Short Equity Hedge, Managed Futures, Multi-Strategy, and Funds of Funds. LO, at 122.

¹¹¹ LO, at 165.

¹¹² LO, at 165.

A Crowded Trade is the term for a strategy that has maximized its potential returns.¹¹³ A strategy becomes crowded when returns on that strategy are diminished because opportunities to profitably implement the strategy have been similarly diminished.¹¹⁴ What results is that quant firms become price setters, at which point crowding can cause prices to severely overshoot fair values, and expected returns diminish or completely reverse very rapidly.¹¹⁵ When a strategy becomes crowded, it is generally the result of either two causes: (1) the strategy has been recognized as profitable, and then copied and implemented by numerous investors; or (2) a single investor has assets that have grown to exceed the total opportunities to pursue a strategy, essentially crowding oneself out of a trade.¹¹⁶

Investors that copy the strategies of innovators are simply trend followers, but are deemed “copycats” because they have copied the profitable trading strategy.¹¹⁷ What constitutes copying varies and does not necessarily mean cloning.¹¹⁸ Copying can be

¹¹³ *Quantcentration*, at 5. (“[In the Crowded Trade], information decays more rapidly and managers now must hold smaller positions and trade out of these positions much more quickly, or they run the risk of holding positions when the alpha has disappeared or even reversed.”)

¹¹⁴ CHINCARINI, *supra* note 1, at 1 (“[P]ortfolio managers create innovation. This innovation usually makes abnormally large returns, so others desperately want to copy the strategy. These copycats eventually learn the ropes and begin trading money in the same fashion. At first this leads to even more profits for the early innovators, because other buy more and more of their trades. These copycats create a side effect however: They crowd the space. The strategy’s future returns depend increasingly on the copycats behavior.”); *But see also*, Rochester Cahan & Yin Luo, *Standing Out From the Crowd: Measuring Crowding in Quantitative Strategies*, 39 JOURNAL OF PORTFOLIO MANAGEMENT 14, at 15 (2013); David Easley et al., *Opaque Trading, Disclosure, and Asset Prices: Implications for Hedge Fund Regulation*, 27 Review of Financial Studies 1190, at 1192 (2014).

¹¹⁵ *Quantcentration: Implications for Quantitative Equity Investing* (Quantitative Investment Strategies: Equity, Goldman Sachs Asset Management), Mar. 2008, at 3.; *See* Daniels, *supra* note 54, at 12.

¹¹⁶ LO, at 16. (“As assets under management increase, it becomes progressively more difficult for fund managers to implement strategies that are truly uncorrelated with broad-based market indexes.”); *see* CHINCARINI, at 200.; Easley et al., *supra* note 94, at 1191.

¹¹⁷ CHINCARINI, *supra* note 85, at 1.

¹¹⁸ LO, at 2. (stating strategies be guarded or they can be reverse engineered and copied).

both intentional and unintentional.¹¹⁹ All quant managers use similar factors as signals in their alpha models.¹²⁰ Astute traders can quickly pick up on proprietary factors, because of their similarity.¹²¹ Furthermore, their risk modeling and transaction cost optimization factors are also constructed in a naturally similar fashion.¹²² A naturally optimized portfolio “leads to professional quant portfolios that are concentrated in a few hundred similar stocks. Many of these stocks likely appear across many portfolios.”¹²³

Overcrowding is a significant problem for hedge funds that can rapidly shift assets in and out of different markets.¹²⁴ If a fund is having significant success with a specific strategy that is very profitable, it will draw more funds and more managers to that strategy, or attract increased investor allocations to the strategy.¹²⁵ When a strategy becomes crowded, “[t]he increases in managers and assets in a strategy will reduce profit margins, as there is more competition for the same trades, and will increase losses during liquidation phases.”¹²⁶ The phenomenon runs in tandem with the decay effect, addressed in the next section.

D. The Decay Effect

A strategy is said to have experienced “Decay” when the returns on that strategy results in steadily declining returns over time.¹²⁷ The time period over which this

¹¹⁹ *Id.*, at 133.

¹²⁰ *Id.*; *but see also*, Cahan & Yuo, *supra* note 92, at 16

¹²¹ *Id.*; *see also* LO at 2, 201.

¹²² LO, at 2; Easley et al., *supra* note 94, at 1191.

¹²³ *Id.*; *See also* LO, at 16; *accord* Cahan & Yuo, *supra* note 92, at 17.

¹²⁴ MARKET SENSE at 78.

¹²⁵ *Id.*; Easley et al., *supra* note 94, at 1191.

¹²⁶ *Id.*; *But see also*, Cahan & Yuo, *supra* note 92, at 16.

¹²⁷ Khandani & Lo, at 24.

reduction occurs is relative to the time horizon of the strategy or the horizon in which alpha returns are evaluated.¹²⁸ Regardless of time, the repeated implementation of the strategy results in diminishing returns, and the measure of an individual manager's alpha then declines.¹²⁹ This Decay is the effect of many firms employing similar strategies, in turn reducing profit margins to fractions of previous time measures.¹³⁰

The reason for the decay is less relevant than the diminishing alpha returns. Managers must achieve benchmark returns in order to satisfy investors, and those returns must be consistent. When alpha decays from a strategy, that leads managers to implement different strategies, either through alternative investment avenues or amplified leverage.¹³¹

E. Leverage

Once a strategy has been crowded out or the returns have decayed, funds have few options to continue realizing returns on par with historical averages.¹³² Particularly, if a crowded strategy had been an original innovation, that strategy must find alternative ways to eek out returns in the crowded space.¹³³ Any options the fund manager uses, while is quite normal as an investment strategy, can cause catastrophic externalities when

¹²⁸ BROWN, Lo.

¹²⁹ Easley et al., *supra* note 94, at 1191.

¹³⁰ BROWN at 165 (“[T]he average daily returns of the contrarian strategy declined from 1.38 percent in 1995 to 0.13 percent by 2007.”). *See also infra* Part (look at bluebook rule 3 p 71)

¹³¹ Khandani & Lo, at 24; Brunnermeier & Pedersen, *supra* note 82, at 5; BELMONT, *supra* note 2, at 218.

¹³² BROWN, at 166

¹³³ LO, at 199.

unexpected events occur.¹³⁴ Implementing leverage is a single option choice that exacerbates both positive and negative returns.¹³⁵

One option is to add leverage to the fund to the fund to amplify returns. Simply defined, leverage is the market value of all positions held by the fund, both long and short, divided by the fund's equity capital.¹³⁶ Leverage is the classic double edged sword; in good times, it can generate returns multiple times those possible with the face value of the collateral, but when shocks and unexpected events occur, leverage can magnify losses in the same fashion.¹³⁷ This danger of severe leverage in one asset class is that it can have problematic effects in other, unrelated asset classes.¹³⁸

Another alternative is to invest in alternate strategies. Divergence from a core strategy, or "Style Drift," discussed in the next section, is always a risky endeavor.¹³⁹ Asset managers are safest using investment strategies they are familiar with. When using new strategies to true and boost returns, funds can make decisions that are rooted in a less than thorough understanding of the investment strategy.¹⁴⁰

F. Strategy Divergence and "Style Drift"

¹³⁴ Khandani & Lo, at 10.

¹³⁵ LO, at 25. ("Because many hedge funds rely on leverage, the size of the positions are often considerably larger than the amount of collateral posted to support these positions. Leverage has the effect of a magnifying glass, expanding small profit opportunities into larger ones but also expanding small losses into larger losses.")

¹³⁶ DIXON ET AL., *supra* note 15 at 25.

¹³⁷ DIXON ET AL., *supra* note 15 at 50; *see also* CHINCARINI, at 1;

¹³⁸ This is the systemic risk paradox that results. Daniels, *supra* note 55, at 18.; Pedersen, *supra* note 29, at 181.

¹³⁹ *See* discussion *infra*, Part IV, subsection

¹⁴⁰ Also, a great way to get a manager fired.

When fund managers venture into new and unfamiliar asset classes (or markets), the effect is that of them plotting a course for unknown waters.¹⁴¹ When sophisticated investors experience “Style Drift” further and further from their central understanding, the risk of poor or uninformed investment choices amplifies.¹⁴² When significant assets are thrown behind a vaguely understood strategy, the systemic risk can be utterly catastrophic.¹⁴³

The divergence into exotic or highly specialized financial instruments is a signature of hedge fund investing, be it advertent or not.¹⁴⁴ These markets can often contain relatively few buyers and sellers, and are thus considered “Thin.”¹⁴⁵ Liquidity in such thin markets can rapidly disappear, which causes steep declines in asset prices when a fund decides or is forced to sell.¹⁴⁶ When those asset prices decline, funds holding similar assets feel the negative price pressure on their own holdings.¹⁴⁷ If assets that are used as collateral for employing leverage experience this price decline, credit quickly dries up and financial panic ensues.¹⁴⁸

¹⁴¹There are many reasons for this, but a common issue with large funds is that they employ so much capital that they exhaust the market inefficiencies and investments that grew them in the first place, essentially crowding themselves out of their own strategy. *EFFICIENTLY INEFFICIENT* at 72.

¹⁴² *EFFICIENTLY INEFFICIENT*, at 72. (When a growing hedge fund “. . . starts to diversify into more and more different strategies. . . the expected paper return may start to decline as the hedge fund starts diversifying into markets and trading strategies where it lacks expertise, a behavior call ‘style drift’”).

¹⁴³ For a comprehensive account of catastrophic strategy divergence and the implosion of Long Term Capital Management, *see* *WHEN GENIUS FAILED*, Roger Lowenstein.

¹⁴⁴ *DIXON ET AL.*, *supra* note 15, at 28.

¹⁴⁵ *Id.*

¹⁴⁶ *Id.*; Brunnermeier & Pedersen, *supra* note 82, at 4-5; BELMONT, *supra* note 2, at 3, 50.

¹⁴⁷ *LO*, at 201; BELMONT, *supra* note 2, at 103.

¹⁴⁸ *Id.* (arguing that the withdrawal of credit forces liquidation of large positions in declining assets, sending panic across investors.); Ben-David et. al., *supra* note 42, at 4-5; BELMONT, *supra* note 2, at 103.

Long Term Capital Management (LTCM) presents a textbook, albeit tragic, case study of the consequence of misguided diversification. LTCM's ultimate liquidation was a result of issues that defied their computer modeling.¹⁴⁹ By employing significant leverage in seemingly diversified—yet correlated—investment strategies, LTCM not only blew themselves up, but threatened to topple the whole financial system in their wake.¹⁵⁰ If copycats see that a certain fund has a successful record, and take their disclosed holdings to reverse engineer a copycat strategy, the increased volume of assets held under that strategy can create severe systemic risk.

V. EXPERT OPINION AND THE RISK OF CONTAGION

Systemic risk has many names in academia, each being provocative to a varying degree. The phenomenon of crowding in quantitative strategy has been dubbed “Quantcentration” by one prominent report.¹⁵¹ Portfolio and Investment risk that results from others holding a similar portfolio is now known as “Contagion” or “Common Investor” Risk.¹⁵² This risk is characterized by 2 parts. The first part concerns how crowded the specific quant strategy is. The second part relates to what other instruments

¹⁴⁹ NARANG at 187; CHINCARINI, *supra* note 2, at 1.

¹⁵⁰ NARANG, at 187. (“[LTCM] was engaged in a very broad cross-border and cross-asset class yield game in which they constantly sought to own risky assets and sell safer ones against them.”)

¹⁵¹ *Quantcentration: Implications for Quantitative Equity Investing* (Quantitative Investment Strategies: Equity, Goldman Sachs Asset Management), Mar. 2008, at 1.

¹⁵² NARANG, BLACK BOX at 186. (“Risk [we experience] not because of the strategy itself but because other investors hold the same strategies. In many cases, the other investors hold these strategies as part of a portfolio that contains other investments that tend to blow up periodically.”)

and positions are held by competing investors and how those holdings could force them to exit the quant strategy in a hurried panic.¹⁵³

This simultaneous panic and exit risk has been dubbed by one expert as “The ATM Effect.”¹⁵⁴ The ATM Effect is the result of a flight to liquidity; liquid assets are sold off to cover the risk exposure of less liquid or completely illiquid holdings.¹⁵⁵ The specifics of the process will be detailed in the next section. But, in essence, good, liquid strategies are exited to raise cash to cover the losses of bad, illiquid strategies.¹⁵⁶ This strategy can be swift and painful for any number of counterparts, but the firm that is liquidating exacerbates its harm if it is simultaneously delivering.¹⁵⁷ Leveraged firms will exert additional harm on counterparties in their efforts to meet their obligations.¹⁵⁸

These types of liquidity events are characterized by an irrational paradox: a credit crisis leading to illiquidity in credit instruments sparks a forced sale of more liquid assets that had nothing to do with the credit crisis.¹⁵⁹ August 2007 can be attributed to a variety

¹⁵³ *Id.*; *see also* LO, at 18.

¹⁵⁴ NARANG, BLACK BOX at 186. (“In an ATM effect, significant losses in one strategy cause liquidation of a different, totally unrelated strategy.”); *but see also* LO at 18, (borrowing the scientific notion of phase-locking behavior to describe situations in which otherwise uncorrelated actions suddenly become synchronized.”)

¹⁵⁵ NARANG, at 186; *see* Rothman, *infra* note 157, at 8.

¹⁵⁶ Itzhak Ben-David et al., *The Behavior of Hedge Funds During Liquidity Crises* at 3 (Ohio State University, Charles A Dice Center for Research in Financial Economics, 2010).

¹⁵⁷ LO, at 25.

¹⁵⁸ NARANG, BLACK BOX at 186. (“[The ATM Effect] happens because investors, who have exposures to both [elements of risk], especially if highly levered, reduce their liquid in the face of financial distress and margin calls, since their illiquid holdings are usually impossible to sell at such times. In essence, the good, liquid strategy is exited to raise cash to cover the losses of the bad, illiquid strategy.”)

¹⁵⁹ NARANG, BLACK BOX at 186-187.; *see also*, LO at 201.; *see also*, Rothman, *infra* note 157, at 8; Markus K. Brunnermeier, *Deciphering the Liquidity and Credit Crunch 2007-08*, at 92-93 (National Bureau of Economic Research 2008); Nicole M. Boyson et al., *Hedge Fund Contagion and Liquidity Shocks*, 65 THE JOURNAL OF FINANCE 1789, 1790 (2010).

of driving forces.¹⁶⁰ Most concerning for our purposes, is the widespread proliferation of quantitative long-short equity strategies.¹⁶¹ Another important factor is the practice multi-strategy funds cross-collateralizing many strategies against each other.¹⁶² When credit becomes tight, these cross-collateralized credit strategies become illiquid, and more liquid quant based equity strategies must be liquidated to raise cash during a crunch.¹⁶³

A. Liquidity Spirals and the Gambler's Ruin

Doubling down on leverage to increase volumes in holdings exacerbates the risk that market movements can spark liquidity spirals.¹⁶⁴ When combined with crowded trade and style drift, the results of adverse market movement can be catastrophic.¹⁶⁵ Distinct from traditional forms of investment risk, “Funding Liquidity Risk” is the risk that adverse price movements can evaporate liquidity when prices are uncertain.¹⁶⁶ Liquidity Risk is the risk of a situation “in which too many funds have set up the same trades and may not be able to exit their positions quickly. In such a case, prices may overreact, and liquidity may fall sharply.”¹⁶⁷

¹⁶⁰ NARANG, at 192.

¹⁶¹ NARANG, at 187. (“[by early 2007] quant long-short traders likely controlled about \$1 trillion in gross positions (the value of longs and absolute value of shorts added together).”);

¹⁶² *Id.*

¹⁶³ NARANG, at 188-189.; *see also* LO at 25.

¹⁶⁴ LO, at 199-201.

¹⁶⁵ NARANG, at 192.

¹⁶⁶ MARKET SENSE at 95–96. (“Getting out of illiquid positions may require selling at a very large discount, especially if the order size is large. Liquidity is prone to large variation. When Markets are rising and volatility is low, even less liquid holdings may be able to be liquidated without creating a major negative impact. In a bear market, however, the value at which an illiquid portfolio can be closed out is likely to be far lower than implied by the most recent price prints.; Investors should realize that for illiquid portfolios, market prices may not reflect portfolio value and may greatly exaggerate the dollar amount that would be realized if the portfolio were liquidated.”).

¹⁶⁷ DIXON ET AL., *supra* note 15, at 5, note 15 citing to stultz; *see also*, MARKET SENSE at 97. (“The fact that many funds hold similar positions amplifies the gap between supply and demand during risk-aversion

Liquidity risk is exacerbated most when a fund is holding illiquid positions.¹⁶⁸ The risk arises when these illiquid positions must be promptly and aggressively liquidated, most often at a large loss.¹⁶⁹ The instant need for liquidity, or the motivation to sell illiquid positions at a loss, can stem from the Fund's desire to exit positions it no longer has confidence in, or to meet sudden investor redemptions or creditor margin calls.¹⁷⁰ Since illiquid markets most often correlate to with Thin markets, steep price declines result from a dearth of buyers.¹⁷¹ Liquidity risk reaps the most damage to the market at the most inopportune times.¹⁷²

The paradox of the gambler's ruin, is that position unwinding is forced at times when investment opportunities are particularly good.¹⁷³ Downward pressure from one fund unwinding a significant position puts forced pressure on other investors—through margin calls, depressed asset values and tactical portfolio rebalancing or forced fire sales—to similarly unwind positions in a depressed market, further depressing prices and causing others to sell, creating an adverse feedback loop.¹⁷⁴ A particular liquidity spiral

periods, resulting in especially wide bid/ask spreads, and extracting a large penalty from those forced to liquidate.”); accord Rothman, *infra* note 157, at 8.

¹⁶⁸ Market Sense at 95.

¹⁶⁹ Id.

¹⁷⁰ MARKET SENSE at 96.; Nicole M. Boyson et al., *Hedge Fund Contagion and Liquidity Shocks*, 65 THE JOURNAL OF FINANCE 1789, 1790 (2010).

¹⁷¹ Id.

¹⁷² MARKET SENSE at 96. (“Ironically, liquidity risk is most problematic at the most inopportune times. Liquidity conditions will be worst during crisis periods when a flight-to-safety market psychology prevails and heavy investor redemptions force funds to liquidate their holdings.”); M.K. Brunnermeier & L.H. Pedersen, *Market Liquidity and Funding Liquidity*, 22 REVIEW OF FINANCIAL STUDIES 2201, at 2207 (2009).

¹⁷³ EFFICIENTLY INEFFICIENT, at 81. (Funding liquidity risk, or the ‘Gambler’s Ruin’ is the risk that you are forced to sell your positions and, in the extreme, that you are forced out of the game.”).

¹⁷⁴ EFFICIENTLY INEFFICIENT, at 81. (“[Forced Selling] can depress prices and, more importantly, because forced liquidation does not happen at random times. When one hedge fund is forced to liquidate, it is more likely that other similar funds are also in trouble, which means that they may be selling similar securities

of note, the 2007 “Quant Quake,” is detailed in the next section. Liquidity spirals can function upwards as much as they can function downwards.¹⁷⁵ Upward Liquidity Spirals are prevalent during times of cheap credit and high return investments, permissibly incentivizing the use of leverage and exotic financial instruments.¹⁷⁶

Unexpected drivers of large swings in equity prices can diverge significantly from traditional quantitative expectations.¹⁷⁷ Particularly significant price swings can cause ripple effect disruptions in alternative markets that funds have similar positions in.¹⁷⁸

B. August 2007

The first week of August 2007 was ultimately the precursor to the mortgage meltdown of 2008, but it was an unforeseen and devastating event for quantitative investment managers.¹⁷⁹ These quantitative investors hit the hardest where Market Neutral and Stat Arb funds focused on exchange traded equities, funds that by definition and construction have minimal beta exposure and immunity from market gyrations.¹⁸⁰

and that there are therefore fewer natural buyers with ready money.”); *see also*, Rothman, *infra* note 157, at 8.; Boyson et al., *supra* note 148, at 1790.

¹⁷⁵ Lasse Heje Pedersen, *When Everyone Runs for the Exit* (National Bureau of Economic Research 2009), at 181. (“In the years preceding the crisis, the global financial markets were flush with liquidity due to low interest rates, high savings rates in Asia, economic growth, and low volatility. As a response to low borrowing costs and low apparent risk, financial institutions became highly levered (a positive liquidity spiral).”).

¹⁷⁶ M.K. Brunnermeier & L.H. Pedersen, *Market Liquidity and Funding Liquidity*, 22 REVIEW OF FINANCIAL STUDIES 2201 (2009).

¹⁷⁷ Pedersen, *supra* note 29, at 187. (“even though momentum is normally negatively correlated to value, these strategies became positively correlated as they both experienced significant losses during the unwind. Also, certain high frequency strategies that rely on price reversals were affected due to the unusual amount of price continuation.”).

¹⁷⁸ *Hedge Fund Forum Shopping* at 830. (“as active risk takers across instruments and markets, hedge funds may also exacerbate the risk of systemic failure, as their strategies involve multiple markets with as yet untested instrument links.”)

¹⁷⁹ LO at 255; *see also* Khandanhi and Lo.; *see* Daniel, *supra* note 55, at 14.; *See* Pedersen, *supra* note 29, at 178.

¹⁸⁰ LO, at 255.

Even more remarkable that the laserlike hemorrhaging and losses were concentrated almost entirely on model-drive quant funds positioned long/short in equity.¹⁸¹

Colloquially referred to by experts as the “Quant Quake” or the “Quant Crisis,” the first week of August 2007 saw unanticipated market movements on a colossal scale.¹⁸²

The market events of August 2007 have come to signify the epitome of interrelated quantitative strategies simultaneously reversing.¹⁸³ Against all predictions, models and trends, portfolio holdings that were determined by widely accepted quantitative theory simultaneously acted inapposite to both meticulously constructed models, as well as quantitative theories’ common sense market movement expectations.¹⁸⁴

Not only does this simultaneous market unwinding suggest that the financial sector is unexpectedly interrelated and commonly correlated, but it suggests begets a much more surprising and worrisome conclusion.¹⁸⁵ Investment strategy overlap and market-neutral portfolio correlation extend much further beyond superficially accepted

¹⁸¹ LO, at 255; *accord* Cahan & Yuo, *supra* note 92, at 20.; Daniels, *supra* note 55, at 16.

¹⁸² Khandani & Lo

¹⁸³ Some funds experienced losses that their models predicted as 25 or 30 sigma events, LO, *supra* note 15, at 256.

¹⁸⁴ LO, *supra* note 15, at 256; Matthew Rothman, *Turbulent Times in Quant Land*, Market Commentary/Strategy (U.S. Equity Quantitative Strategies, Lehman Brothers Equity Research), Aug. 9, 2007, at 1.

¹⁸⁵ Pedersen, *supra* note 29, 185. (“In many different markets, it turned out that levered liquidity providing traders had some common features in their portfolios. Despite their different investment philosophies and analysis, one manager’s long position was another manager’s long more often than it was a short.”); LO, *supra* note 15, at 273. (comparing 2007 to August, 1998, arguing that liquidity demand across sectors in 2007 was severe, while 1998 had no discernable cross impact. Suggesting that the market integration is now a vast source of cross asset contagion.); *accord* Cahan & Yuo, *supra* note 92, at 15; *accord* Rothman, *supra* note 157, at 1.

portfolio observations.¹⁸⁶ The “Quant Quake” of 2007 suggests that investment and portfolio management theory creates a much larger and more disconcerting issue of portfolio based systemic risk.¹⁸⁷ When a single or multi strategy fund must deleverage a liquid asset to meet margin calls for a less liquid asset, the value of liquid asset holdings decreases in direct relation with the speed than a manager aggressively liquidates.¹⁸⁸

A single strategy investor deleveraging a portfolio can have minimal effect on the overall market; such market impact can be virtually unnoticeable to the greater market, particularly on volume heavy or momentum intensive days.¹⁸⁹ However, systemic market impact as a result of price impact in multiple asset classes can occur as a result of triggers that are seemingly uncorrelated.¹⁹⁰

¹⁸⁶ Pedersen, *supra* note 29, at 180. (. . . “[L]iquidity spirals” amplify and spread the initial shock when selling leads to more selling, higher margin requirements, tighter risk management, and withdrawal of capital, consistent with the evidence from the crisis that I present.”).

¹⁸⁷ LO, *supra* note 15, at 257. (“ . . . [August, 2007] had less to do with a breakdown of any specific quantitative algorithms than with the apparent sudden liquidation of one or more large quantitative equity market neutral portfolios. Because such portfolios consist primarily of exchange traded instruments,

¹⁸⁸ LO, at 256-257. (“The speed and magnitude of this price impact suggest[s] that [the fund’s] unwind was the result of a sudden liquidation of a multi-strategy fund. . . . This price-impact pattern suggests that the losses were the short term side effects of a sudden and probably forced liquidation. . . . [t]he coordinated losses do imply a growing common component in the hedge fund sector.”); *But See Also*, Tom C. W. Lin, *The New Financial Industry*, 65 ALA. L. REV. 567, 587. (“In the new financial industry of cyborg finance, financial transactions operate at incredible velocities. Billions of transactions worth trillions of dollars move through cables and spectra across seas and states at the speed of milliseconds.”).

¹⁸⁹ Markus K. Brunnermeier, *Deciphering the Liquidity and Credit Crunch 2007-08*, 23 JOURNAL OF ECONOMIC PERSPECTIVES 77, 92 (National Bureau of Economic Research Winter 2009).

¹⁹⁰ Pedersen, *supra* note 29, at 186. (“[L]iquidity shock started to affect the currency carry trade, commercial mortgage-backed securities, convertible bonds, event arbitrage, and fixed-income markets. Investors ran for the exit in one market after another, and the rush to the exits reached its peak after Lehman failed in September 2008. Market liquidity deteriorated in most markets and vanished almost completely in many over-the counter markets. For instance, dealers in emerging-market interest rate swaps largely stopped quoting bid and ask prices. The extreme market liquidity risk was complemented by extreme funding liquidity risk as haircuts and margin requirements went up and certain securities became unacceptable as collateral for many counterparties.”); *see also* Lin, *supra* note 192, at 585 (“Further complicating the risks of ‘too linked to fail’ is the fact that many financial participants engage in similar and interdependent strategies. As such, many of these strategies may be similarly flawed due to shared conceptual biases. As a result, the failing of one participant or one product could not only adversely impact

August 2007 triggered by adverse market movement in asset classes with no apparent correlation, dragging down aggregate portfolios for many investment managers.¹⁹¹ When an aggregate portfolio experience negative pressure based on a portfolio of completely unrelated assets in a diversified strategy, unforeseen consequences arise.¹⁹² While deleveraging one asset portfolio to met the margin calls required of another, anti-trend or contra momentum result of the sell off can run amok of the conventional models that anticipate momentum and movement based on the input parameters.¹⁹³ When the models begin to recognize anomalies within the market movement parameters, every investor—people and computers—see the prices and liquidity moving contrary to expectations.¹⁹⁴ What follows is each of these investors

others, but could also create vicious cycles of volatility for the entire global financial system as trades cascade and generate feedback loops and spillover effects of serious consequences.”).

¹⁹¹ Pedersen, *supra* note 29, at 186. (“By mid-2007, quant managed stock portfolios had about \$300–\$400 billion long and short positions in equities by some estimates. In August, a significant liquidity event occurred in which some quants were forced to unwind and others also reduced positions. The buying and selling pressure was immense. It consisted of hundreds of billions of dollars as aggregate positions were reduced approximately by half according to some prime broker estimates. While the effects were clear to quants, they were at first largely hidden to outsiders since the trades were spread over thousands of stocks, with some stock prices being pushed up and others pushed down. To ‘see’ the event, one must look through the lens of a typical quant’s diversified long-short portfolio at a high frequency.”).

¹⁹² Pedersen, *supra* note 29, at 186. (“In August, a significant liquidity event occurred in which some quants were forced to unwind and others also reduced positions. The buying and selling pressure was immense. It consisted of hundreds of billions of dollars as aggregate positions were reduced approximately by half according to some prime broker estimates. While the effects were clear to quants, they were at first largely hidden to outsiders since the trades were spread over thousands of stocks, with some stock prices being pushed up and others pushed down.”).

¹⁹³ *Id.* (“In June 2007, many banks and some hedge funds experienced significant losses due to credit exposure or to the ripple effects of the credit turmoil. In July, some started to reduce risk and raise cash by selling liquid instruments such as their stock positions, hurting the returns of common stock selection strategies. Some banks even closed down some of their trading desks, including quant proprietary trading operations. Simultaneously, some hedge funds were experiencing redemptions. For instance, some funds of funds (hedge funds investing in other hedge funds) hit loss triggers and were forced to redeem from the hedge funds they were invested in, including quants.”); *but see also*, Rothman, *supra* note 157, at 8.

¹⁹⁴ Lin, *supra* note 185, at 587. (“As cyborg finance expands, the systemic perils posed by ‘too linked to fail’ will only grow more challenging and more pressing in the coming years as the complexity and multiplicity of linkages create greater risks and opportunities for error.”); *See* Rothman, *supra* note 157, at 1.

liquidates their portfolio reduce exposure and stem the bleeding lest it become one monetary hemorrhage of spiraling value drain upon the then-present portfolio positioning.¹⁹⁵

Systemic implication results from when investment strategy overlaps by using active tactical strategies; strategies that draw off of investment in overlapping batches of securities.¹⁹⁶ If a fund is to maintain truly market neutral in their comprehensive investment strategy, there must be equities that are seemingly in favor with a contravening reversion anticipation, and equities which assume the antithetical position within any given portfolio.¹⁹⁷ When these reversion strategies, or anticipatory contrarian strategies, all act in unison, they push asset prices out of equilibria.¹⁹⁸

August 2007 is a direct result of several multi-strategy funds and bank proprietary trading desks deleveraging their portfolios in response to poor performance of credit oriented strategies.¹⁹⁹ Fund Managers were forced to sell of their long equity positions in

¹⁹⁵Lin, *New Finance* at 588 (“Automated programs operating at warp speeds can exacerbate volatility and reduce liquidity during periods of tumult by eliminating trading positions in the marketplace.”); accord Cahan & Yuo, *supra* note 92, at 19.; Daniels, *supra* note 55, at 16.

¹⁹⁶ Pedersen, *supra* note 29, at 185. (“[I]n a standard Markowitz/CAPM world, all investors are holding exactly the same portfolio, namely the “tangency” portfolio with the highest risk-adjusted return. While real-world traders are far more diverse than this theoretical benchmark since they use different methods to estimate risk and expected return, it is natural to expect that at least the most sophisticated traders in a specific market have some overlap in their portfolios since they are striving toward the same goal.”); *but see also*, Cahan & Yuo, *supra* note 92, at 18.

¹⁹⁷ More specifically, opposing securities held in Statistical Arbitrage trade should have Beta Coefficients that average out to 1. With a Beta ratio of 1, these securities will move in sync with market risk, absent any esoteric or endogenous risk, and each security’s specific Beta will prove itself more favorable once the market moves. For a truly Beta neutral portfolio, market neutral excess return = $R_t^e - \beta R_t^{M,e} = \alpha + \varepsilon_t$. EFFICIENTLY INEFFICIENT at 28.

¹⁹⁸ LO, *supra* note 15, at 273.

¹⁹⁹ NARANG, at 190; *see also*, Cahan & Yuo, *supra* note 92, at 19-20; accord Rothman, *supra* note 157, at 1.; Daniels, *supra* note 55, at 18; LO at 281.

order to cover their shorts.²⁰⁰ The result was significant market impact.²⁰¹ What were held as long positions saw violent price declines, while short positions saw massive price gains.²⁰² That any firm holding a quantitative long short strategy saw portfolio divergence to unexpected levels, and this adverse performance resulted in significant portfolio losses.²⁰³ As losses accrue, fund managers must continue to liquidate at the worst time, and the liquidity crisis spirals as an adverse feedback loop.²⁰⁴ This negative adverse feedback loop, impacting only quantitative value strategies, defied any predictable modeling or previous market behavior.²⁰⁵

²⁰⁰ LO, *supra* note 15, at 283.

²⁰¹ *Id.*

²⁰² *Id.*

²⁰³ *Id.*; *See also* Lin, *supra* note 192, at 589. (“While the accelerated speed of finance can be beneficial in terms of efficiencies, the accelerated speed also increases risks of error, volatility, market fragmentation, and malfeasance before anyone can stop it. A single misinformed or rogue trader can cause material damage to a financial institution or the entire system in a very short amount of time. . . . Beyond human traders, automated programs pose even more serious systemic perils related to speed. Automated programs responding to bad data or nefarious stimuli can cause catastrophic harm to financial institutions before remedial or rescue measures can be implemented.”).

²⁰⁴ LO, *supra* note 15, at 185.

²⁰⁵ *Id.* (“The strategy has been scaled to have an annualized volatility of about 6 percent using a well-known commercial risk model. The strategy loses about 25 percent in four days, about four annual standard deviations and more than thirty standard deviations based on the four-day volatility of $(4/260)^{1/2} * 6\% = 0.74\%$. *The thirty standard deviations must be interpreted correctly. This number does not mean that this was a thousand-year flood and can never happen again. It means that the event was a liquidity event, not based on stock fundamentals, and that this risk model does not capture liquidity risk and the endogenous amplification by the liquidity spirals.*”) (emphasis added); *See also*, Daniel, *supra* note 55, at 16 (calculating the chance of occurrence as the six valuation themes each dropping six standard deviations on August 10, 2007, equating to a 36 standard deviation event).

VI. INCREASED CONFIDENTIALITY TO REMEDY

DISCLOSURE RISKS

Section I lays out a brief overview of the Form 13F confidentiality provisions and when they are available to qualifying investment managers.²⁰⁶ As mentioned *supra*, while confidential treatment is possible, in practice, only a select few managers satisfy the stringent qualifications to be granted this treatment.²⁰⁷ The investment community has voiced concern over the lack of confidentiality and its risks to sensitive and proprietary investment strategies.²⁰⁸ Sections IV and V have detailed the risks that result from disclosure and the risks to the health of the overall financial system.²⁰⁹ This section argues that broadening the qualifications that can be afforded confidential treatment serves as a remedy for the risks attendant in the current disclosure paradigm.

The broadest category of qualified filings are those from investment managers “identifying securities held by the account of a natural person or an estate or trust,” excepting those held by a business trust or an investment company.²¹⁰ The form instructs managers seeking confidential treatment to “provide enough factual support for its request to enable the Commission to make an informed judgment as to the merits of the request.”²¹¹ This discretionary standard leaves vast discretion to the Commission to

²⁰⁶ See *supra*, part I.

²⁰⁷ Robertson, *supra* note 25, at 792; See also, Martin, *supra* note 27, at 578.

²⁰⁸ See Congressional testimony; See Robertson, *supra* note 25, at 788, 793; accord Martin, *supra* note 26, at 586.

²⁰⁹ See *supra*, Sections IV and V.

²¹⁰ SEC Form 13F, Page 1, Section 2, para 1.

²¹¹ SEC Form 13F, Page 2, para 4.

decide whether or not a filing qualifies for discretionary treatment, without specifying when a claim is determined meritorious. However, the form instructs filers to describe any applicable conditions from a set listed on the form, to assist in their determination of confidential status.²¹²

Paragraph 2 instructs that managers claiming the subject information “is confidential, commercial or financial information” to provide information detailed in paragraphs 2(a) through 2(e); the instruction does contain a small qualification in paragraph 2(f) for managers holding open risk arbitrage positions.²¹³ Paragraph 2(a) first requires the manager to describe the specific securities holdings that are subject to the acquisition and disposition through the manager’s investment strategy.²¹⁴ Once described, paragraph 2(b) instructs the manager to describe why public disclosure would be likely to reveal the investment strategy; but this instruction is qualified by a strict limitation that the filer must consider the request “in light of the specific reporting requirements of Form 13F, (*e.g.*, securities holdings are reported only quarterly and may be aggregated in many cases).²¹⁵ Thus, the onus is with the filer to prove the sensitivity of the information, in light of the presupposition that the Form 13F requirements are already structured with a significant degree of leniency.²¹⁶ A facial reading suggests that the Commission considers the filing requirements sufficiently lenient, without regard for the sensitivity of the individual investment strategy.

²¹² SEC Form 13F, Page 2, para 2(a)-(g).

²¹³ SEC Form 13F, Page 2, para 2, 2(a)-2(e).

²¹⁴ SEC Form 13F, Page 2, para 2(a).

²¹⁵ SEC Form 13F, Page 2, para 2(b).

²¹⁶ Robertson, *supra* note 25, at 792-793.

Paragraph 2(c) further requires that the manager prove that revealing the information is “premature,” in light of whether the security is being traded both at the close of the quarter and at the time of the filing, and whether the investment strategy is already known to the public.²¹⁷ The term “premature” is defined only to include securities traded within that narrow window between the close of the quarter and the filing, with any other securities seemingly unqualified. Whether or not an investment strategy is known to the public, and to what degree, is an unclear definition and offers no guidance as to what that means, giving broad discretion to the Commission in its determination of “otherwise known to the public.”²¹⁸

Most troublesome is paragraph 2(d), that managers must:

Demonstrate that failure to grant the request for confidential treatment would be likely to cause substantial harm to the Manager’s competitive position; show what use competitors could make of the information and how harm to the manager could ensue.²¹⁹

This requirement imposes both a substantially high burden of proof on manager, that of showing substantial harm, and a detailed explanation of exactly how a competitor can use the information for their own benefit.²²⁰ As I have explained in previous sections, there are a multitude of ways that competitors can use information for their own benefit, to the detriment of the manager.²²¹ With the multitude of disclosure risks possible, the result is significant risk of harm to both the fiduciaries of the manager, and the system as a

²¹⁷ SEC Form 13F, Page 2, para 2(c).

²¹⁸ *Id.*

²¹⁹ SEC Form 13F, Page 2, para 2(d).

²²⁰ Robertson, *supra* note 25, at 793.

²²¹ See *supra*, section IV.

whole.²²² Overlapping positions, coupled with the cross collateralization of assets, can send violent shocks across markets and spread contagion through the system.

While open risk arbitrage positions constitute a limited allowance for potential confidential treatment, the exception is similarly small. Only securities held in an open position on the last eligible filing day constitute protected securities.²²³ Qualified securities are further limited to positions that the manager reasonably believes will not be closed out between the close of the quarter and the last eligible filing date.²²⁴ Within the broad realm of strategic merger arbitrage and its inherent contingencies (such as bidding wars, deal collapse, macro economic shifts, etc.) these limited exceptions do not offer significant opportunities for confidential treatment.

Enhancing the ability for investment managers to attain confidential status recognizes the value of a proprietary trade secret, while not adversely affecting the Commission's ability to analyze and compile data about the market.²²⁵ Prominent fund managers have voiced their support of enhanced disclosure obligations, and a willingness to engage regulators more, so long as that disclosure remains privately held by the regulators.²²⁶ The current disclosure paradigm creates serious systemic risk when competing investment managers with overlapping portfolios must respond to unexpected events. Sensible changes to the regulation can have the threefold benefit of empowering regulators through enhanced disclosures, protect strategies for the benefit of the

²²² See *supra*, section V.

²²³ SEC Form 13F, Page 3, para 2(f)(i).

²²⁴ SEC Form 13F, Page 3, para 2(f)(ii).

²²⁵ Martin, *supra* note 26, at 595-596.

²²⁶ Fund managers panel.

investment manager and their investors, and reduce the contagion effects of unexpected events.²²⁷ Much like the relationship between the US Banks and the Office of the Comptroller of Currency, it is possible to collect and analyze extensive hedge fund data in the same fashion, while protecting the confidentiality of the parties involved.²²⁸

VII. CONCLUSION

It is not easy task for regulators to balance the proprietariness of investment strategies against the need for disclosure. Disclosure serves a vital purpose in informing both the regulators and the public about risks and returns that individual funds produce. However, disclosure is also beset by negative externalities that can have serious consequences on the health of the overall financial system. When positions are made public through disclosure, it is more than just the regulators that become privy to a specific fund's investment strategy. For sophisticated and competitive investment managers, having access to portfolio information can allows one manager to clone or copy the investment strategies of another. When multiple funds align portfolios with copied positions, any shock to the system can send ripples across markets and asset classes. However, this risk can be remedied simply and sensibly. Regulatory disclosure can still serve its purpose to apprise regulators of institutional risk without being made public. By requiring the same amount, if not more information from funds, but assuring it is kept confidential by the regulator, systemic copycat risk can be significantly curbed.

²²⁷ Martin, at 596.

²²⁸ LO, at 252.

VIII. APPENDIX A: REGULATION TEXT:

§ 240.13f-1 Reporting by institutional investment managers of information with respect to accounts over which they exercise investment discretion.

(a)(1) Every institutional investment manager which exercises investment discretion with respect to accounts holding section 13(f) securities, as defined in paragraph (c) of this section, having an aggregate fair market value on the last trading day of any month of any calendar year of at least \$100,000,000 shall file a report on Form 13F ([§ 249.325](#) of this chapter) with the Commission within 45 days after the last day of such calendar year and within 45 days after the last day of each of the first three calendar quarters of the subsequent calendar year.

(2) An amendment to a Form 13F ([§ 249.325](#) of this chapter) report, other than one reporting only holdings that were not previously reported in a public filing for the same period, must set forth the complete text of the Form 13F. Amendments must be numbered sequentially.

(b) For the purposes of this rule, “investment discretion” has the meaning set forth in section 3(a)(35) of the Act ([15 U.S.C. 78c\(a\)\(35\)](#)). An institutional investment manager shall also be deemed to exercise “investment discretion” with respect to all accounts over which any person under its control exercises investment discretion.

(c) For purposes of this rule “section 13(f) securities” shall mean equity securities of a class described in section 13(d)(1) of the Act that are admitted to trading on a national securities exchange or quoted on the automated quotation system of a registered securities association. In determining what classes of securities are section 13(f)

securities, an institutional investment manager may rely on the most recent list of such securities published by the Commission pursuant to section 13(f)(4) of the Act ([15 U.S.C. 78m\(f\)\(4\)](#)). Only securities of a class on such list shall be counted in determining whether an institutional investment manager must file a report under this rule (§ 240.13f-1(a)) and only those securities shall be reported in such report. Where a person controls the issuer of a class of equity securities which are “section 13(f) securities” as defined in this rule, those securities shall not be deemed to be “section 13(f) securities” with respect to the controlling person, provided that such person does not otherwise exercise investment discretion with respect to accounts with fair market value of at least \$100,000,000 within the meaning of paragraph (a) of this section.²²⁹

²²⁹ 17 C.F.R. 240.13f