

The Challenges of Detection and Enforcement of Insider Trading

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Special Issue on The 27th EBEN Annual Conference in Berlin

Guest Editors: Michael S. Abländer · Tobias Gössling · Peter Seele

Editorial: Business Ethics in a European Perspective: A Case for Unity in Diversity?

M.S. Abländer · T. Gössling · P. Seele 633

Accounting Professionals' Ethical Judgment and the Institutional Disciplinary Context: A French-US Comparison

L. Bañada-Hirèche · G. Garmilis 639

Suppliers as Stewards? Managing Social Standards in First- and Second-Tier Suppliers

M.S. Abländer · J. Roloff · D.Z. Nayir 661

The Relationship Between Ethical Organisational Culture and Organisational Innovativeness: Comparison of Findings from Finland and Lithuania

R. Pučetaitė · A. Novelskaitė · A.-M. Lämsä · E. Riivari 685

Trust and Distrust Constructing Unity and Fragmentation of Organisational Culture

J. Kujala · H. Lehtimäki · R. Pučetaitė 701

Understanding Responsible Management: Emerging Themes and Variations from European Business School Programs

G. Nonet · K. Kassel · L. Meijs 717

Beyond the Curriculum: Integrating Sustainability into Business Schools

M. Painter-Morland · E. Sabet · P. Molthan-Hill · H. Goworek · S. de Leeuw 737

Ethical Decision-Making Theory: An Integrated Approach

M.S. Schwartz 755

Continued on back cover

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The Challenges of Detection and Enforcement of Insider Trading

Brian J. Adams¹ · Tod Perry² · Colin Mahoney¹

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Abstract Trading on non-public material information is fertile ground for a discussion of ethical behavior. The long-running legal tug-of-war over what constitutes illegal insider trading delivers challenges to regulatory authorities charged with detecting and enforcing the law, and is likely one of the reasons that prosecution of insider trading events remains rather uncommon. One can observe both increased volume in the equity and option markets and run-ups in the stock price prior to the announcement of the acquisitions; however, the detection of illegal or unethical insider trading can be difficult. Given the legal uncertainty around insider trading and the circumstantial evidence from the trading activity, it is almost impossible to identify unethical insider trades unless there is a whistleblower or trades are large in size and impeccable in timing. Using call option trading around two merger announcements with similar firms that resulted in different ultimate treatment from the SEC, we illustrate the struggle regulators and prosecutors have with identifying and enforcing unethical insider trades.

Keywords Accounting and finance · Insider trading · Ethics · Mergers · Securities law

Introduction

Socrates would tell us there are issues with the detection of an unethical trader's actions without knowing their motivation. According to Socrates, "He has only one thing to consider in performing any action—that is, whether he is acting right or wrongly, like a good man or a bad one". Therefore, determining the ethical nature of a trade by analyzing trading volume and returns leading up to a merger announcement can easily lead us to incorrect conclusions. The statistics alone are not sufficient to determine ethical behavior.

One reason is the legal ambiguity around the definition of illegal insider trading creates ethical uncertainty. Since the 1980s, legal decisions have been made in favor of 'caveat emptor' (let the buyer beware), only to be overturned. Other cases were decided against traders for misappropriating inside information, and those cases were also overturned. Furthermore, these outcomes were instances when the use of insider information was uncovered (for a discussion on how not to get caught insider trading, see Levine 2014).

A second reason for the difficulty in the detection of unethical insider trading is research on the ethics of insider trading reaches ambiguous conclusions too. There are arguments that conclude insider trading should be condoned (see for example Manne (1966) and McGee (2009)), as it can make markets more efficient through the revelation of private information by the insider trades. Contrasting arguments (see for example Meulbroek (1992)) conclude that the asymmetric information environment increases trading costs. Cornell and Sirri (1992) find liquidity can improve with insider trading, but the inside traders receive superior order execution. We appear to be no closer to a consensus definition of the legal and ethical

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use of insider information today than we were when modern financial markets were formed after the Great Depression.

A related issue involves the enforcement of insider trading laws that do exist, and the legal and ethical issues involved from the regulator's perspective. Profitable, timely trades that are similar in nature and occur prior to the release of market-moving information may result in disparate treatment from the regulatory authorities depending on the facts and specific characteristics of the trades and trading parties. Given that enforcement of insider trading laws has been found to improve liquidity and reduce the cost of capital (see Bhattacharya and Daouk (2002)), these issues are relevant and important as it relates to the functioning of the capital markets.

Using call option transactions occurring around two similar acquisition announcements, we examine the trading activity and speculate why one transaction was determined to be illegal and unethical insider trading while other transactions were not. Financial markets with a high frequency of trading activity, such as equities, create enough consistent 'noise' that large transactions prior to material news releases attract less attention. Financial markets with lower volume, such as call options, give regulators a better chance of identifying possible illegal activity. However, we highlight the challenges for anyone, outside of the insider trader themselves, to determine legality and ethical motivation behind most financial transactions.

This research contributes to the discussion of the ethical nature and the difficulty associated with identifying insider trading and the enforcement aspects given legal and ethical uncertainty. Previous theoretical research discussed the ethical implications of insider trading but not the ethical implications of detection and enforcement of illegal insider trading. Past empirical research in this area has developed tools to identify possible insider trading and the associated cost. However, these studies mostly analyze aggregate information, which obscures specific unethical or illegal events and the nuances, at least from a regulator's perspective, of what appears ethical and what appears unethical. Studies of cases of specific insider trading activity, such as Cornell and Sirri (1992), have examined the affects of insider trading but not compared the illegal, and assumed unethical, trading around a merger with a similar corporate event where no illegal trading was identified and prosecuted.

The goal of this paper is to highlight the challenges of detecting and enforcing illegal and unethical insider trading. This outcome will not render earlier research in this area moot. Rather, we are furthering the discussion into the effectiveness of detecting illegal insider trading and the merits of an enforcement system that provides beneficial deterrent effects. Similar to Engelen's (2006)

analysis of how European courts address illegal trading, we analyze how American regulators might identify illegal insider trading. By comparing and contrasting similar merger events, one with illegal and unethical insider trading and the others without explicit identification of unethical behavior, we can gain a better understanding of the opaqueness involved in the detection and enforcement of unethical trading in financial markets. Outside of a whistleblower, regulators are resigned to waiting for a trader to execute a trade of a size and timing precision that would prompt further investigative work. We are left with the question whether regulators can develop ethical protocols and obtain the resources to identify and enforce potentially illegal insider trading.

Background

Manne (1966) was one of the first to consider the ethics of insider trading in suggesting that corporate insider trading is compensation for the entrepreneurial activity of collecting material information. In addition, Manne suggested that this additional information makes financial markets more efficient through the accurate pricing of securities and the incorporation of private, value-relevant information. Finally, Manne argued that corporate insider trading is a victim-less crime, and if no one's rights are violated, then this behavior is likely ethical. Akerlof (1970), on the other hand, argues that if buyers know there is asymmetric information, the price they would be willing to pay for assets would be reduced and liquidity decreased. Akerlof's argument was based more on the fraudulent use, or non-use, of material information, but his argument has been supported with empirical evidence from the mergers and acquisitions market (see Meulbroek (1992)).

McGee (2009) discusses the relevance of utilitarianism in insider trading cases. He asserts that if insider trading results in a "positive-sum game", where there are more gains from trading on non-public material information (such as market efficiency) than losses (such as monetary losses realized by the other party), then insider trading is ethical. However, in his concluding statements, McGee stated that utilitarianism is not the correct ethical lens with which to view insider trading because it is virtually impossible to aggregate all gains and losses from a trade based on inside information.

An alternative viewpoint is incorporated in the role of the United States Securities and Exchange Commission (the "SEC"), which advocates for the use of non-public material information based on consequentialism and virtue ethics:

“Our markets are a success precisely because they enjoy the world’s highest level of confidence. Investors put their capital to work—and put their fortunes at risk—because they trust that the marketplace is honest. They know that our securities laws require free, fair, and open transactions”.

Arthur Levitt, Chairman of SEC (February 1998).

The goal of the SEC is to “protect investors, maintain fair, orderly, and efficient markets, and facilitate capital formation”.¹ If a country’s financial markets are perceived as virtuous, they will attract capital and traders and have improved liquidity, which will have the positive consequence of increasing the value of firms and their financial securities. Thus, consequentialism may be a better ethical lens with which to detect unethical insider trading, with the potential negative consequences being a perception of unfairness, leading to a loss of liquidity with lower volumes and higher bid–ask spreads. Bhattacharya and Daouk (2002) and Fernandes and Ferreira (2009), among others, provide empirical evidence supporting the positive impact of enforcement of insider trading laws.

Using virtue ethics to detect unethical insider trading requires self-awareness; people taking the right action for internal, not external, benefit. Dobson (1993) argued the motivation or character of a trader using non-public material information is what determines the ethics of their actions. If traders are truly virtuous, we have no way of knowing because we cannot quantify the internal good of traders. Additionally, it is difficult for people to follow an ethical norm if there is ambiguity as to what is right or wrong with a behavior. According to Dobson (1993), for ethics to be accepted in the financial community requires first and foremost that a justification for ethical behavior be clearly and unambiguously delineated. Therefore, virtue ethics would not be of much help with detecting unethical insider trading.

The clearest definition of the ethical use of insider information may come from a rights-based approach. (Engelen and Van Liederkerke 2007) used the two-step process of Macey (1988) in advocating for the rights-based approach as a framework for evaluating the ethical behavior of insider traders. The two steps are to determine: (1) who holds ownership rights of the information and (2) whether the owner gave the trader permission to use the inside information. McGee (2009) illustrated the very straightforward rights-based approach with a similar two-step flow chart. If we can define the ownership of insider information, then we may have a black & white ethical lens with which to view insider trading.

Clearly defined legal rules and regulations might help establish a framework for detecting unethical insider trading; however, the current legal analysis related to insider trading leaves gray areas due to the ambiguity of the law and challenges in enforcement. According to Dalley (1998), in US common law there is no fraud liability for failing to disclose material, non-public (insider) information, while conducting a financial transaction with an exception for when a fiduciary relationship exists and the fiduciary trades on non-disclosed information with his or her contracted beneficiaries. Without a formal common law definition of insider trading, the SEC established Rule 10b-5 of the Securities Exchange Act of 1934, which combined with subsequent judicial opinions and additional SEC Rules, forms the basis for the insider trading laws in the United States.

The U.S. legal system has spent the past 50 years sending contradicting signals to financial markets about what constitutes insider trading. For example, in the 1980 case of *Chiarella v. United States* the Supreme Court reversed the conviction of a print shop worker who learned of a corporate merger by obtaining the security code to unlock the information and bought the target stock before the merger was announced. Non-disclosure of the non-public, material information by the employee was not considered fraud since the defendant did not have a fiduciary duty to disclose the information. The SEC subsequently adopted Rule 14e-3, which prohibits any person possessing material information relating to an upcoming tender offer bid by another person from trading in the securities of the target company. In 1997, the U.S. Supreme Court broadened the scope of what constitutes insider trading by upholding the rule and accepting the ‘misappropriation theory’ in the decision on *United States v. O’Hagan*.

Activity since the 2008 financial crisis leaves the impression that the SEC has been increasing its focus on insider trading in recent years, as the SEC and the US Department of Justice was able to obtain insider trading convictions on two high profile hedge funds.² In October 2011, Raj Rajaratnam, of the Galleon Group was found guilty, in federal court, on 14 charges of insider trading and sentenced to 11 years in prison and fined a total of \$150 in criminal and civil penalties. In November 2013, S.A.C. Capital Advisors pled guilty to insider trading charges before going to federal court and paid \$1.2 billion in penalties. However, the recent overturn of insider trading convictions of hedge fund managers Anthony Chiasson and Todd Newman has raised new questions

¹ <https://www.sec.gov/about/whatwedo.shtml>.

² See Del Guercio et al. (2015) for a discussion and supporting empirical evidence of the increased enforcement intensity from the SEC during this period.

about the legality of certain behaviors (for example, see “Friends without benefits”, 2015 October 10th). Over 30 years after the *Chiarella* case, there is still legal uncertainty on the definition of what constitutes an illegal insider trade, which in turn clouds the discussion of the ethics associated with insider trading and enforcement of the rules. Given the positive relationship between enforcement of our insider trading laws and improved liquidity and lower costs of capital, however, regulatory enforcement of the level playing field in the markets is important. If traders are operating in the legal gray area in which possibly unethical trading behaviors may be found to be legal, the enforcement regime will have ethical consequences.

From the consequentialism perspective, the attempted enforcement of the insider trading laws is important. Using the real options framework for evaluating insider trading enforcement established in Engelen (2004), more consistent prosecution of insider trading by the regulatory authorities reduces the value of the option to trade on inside information for the trader. An enforcement strategy that reduces the uncertainty to the trader in turn reduces the value and benefit of the insider information. For example, trades that are similar in nature and characteristics should be handled in a consistent manner by the regulators. The nature of trading activity in periods immediately prior to acquisition announcements, however, can easily lead to disparate treatment for what appears to be identical trades. In the next section of the paper, we examine more closely the trading activity in the options and equity markets for two firms that were subsequently acquired. In one case, the SEC brought charges of insider trading, and in the other case no formal charges have been observed although trading patterns in the preannouncement period were similar for the two firms.

Quantifying the cost and benefits of insider trading and enforcement of the insider trading regulations and laws provides data to help resolve ethical concerns. Prior empirical studies on the impact of insider trading have attempted to measure the cost of the behavior to affected businesses or the costs and/or benefits to the capital markets in aggregate. (Meulbroek 1992) reports that over 40% of the price appreciation in target firm's stock before tender announcement is directly due to insider trading, and (Meulbroek and Hart 1997) report that illegal insider trading increases takeover premiums by 10%. On the other hand, Del Guercio et al. (2015) look at more recent transactions and find a significant negative relation between the preannouncement price appreciation and measures of SEC enforcement activity. They interpret the results as suggesting that increased SEC enforcement activity has had a deterrent effect and reduced the levels of insider trading prior to the disclosure of the bid. Our

approach is to examine these issues more closely using information from two cases described below.

Case Study: Option Trading prior to the HJ Heinz and Kraft Acquisitions

An alternative approach to examining the ethical aspects of insider trading and the ancillary detection and market impact issues has been to look at individual cases. Cornell and Sirri (1992) examine detailed transactional data around the 1982 acquisition of Campbell Taggart by Anheuser Busch, compiled through the various court documents associated with the case. Cornell and Sirri have the unique ability to examine intraday price and volume effects of each individual illegal inside trade because they can identify the specific trades that were known to be illegal trades. Engelen (2006) also uses a case-based approach and examines the attempted prosecution by Belgian authorities of insider trading around a dividend announcement in Bekaert, NV. In a case that was watched closely because it was one of the first cases attempting to prosecute insider trading under a new law, the Appeals Court ruled that the information used by the accused parties was not value-relevant and therefore was not privileged because it had already been disclosed that the firm would pay a dividend and dividends have been found to be irrelevant to the markets. Engelen uses the case to discuss the problems with burden of proof standards in these cases and how statistical analysis can be used to help in the determination.

We build on these earlier case studies by looking more closely at trading activity in the option markets in the pre-announcement period for two large acquisitions: HJ Heinz and Kraft Foods. The option market is an attractive place to exploit for a trader in possession of insider information on an impending takeover, and the findings of Beny and Seyhun (2012) lead us to believe that traders are increasingly using non-public material information in the derivatives markets, possibly due to the ambiguity of the ethical and legal implications. Relative to equities, options are cheaper and provide greater returns than equities. Our analysis focuses on out-of-the-money call contracts (defined as a Strike price-to-Stock price ratio between 80 and 95% as in (Cao et al. 2005)), since these contracts have the possibility of a significant return, assuming a takeover premium of approximately 10–25%. A drawback to trading options rather than equities for a trader is that options are time-depreciating assets. A trader can have accurate information about the possibility of a future takeover bid, but if the options expire before the announcement of the bid, the investment could be lost. For example, if the takeover announcement is expected to occur in late February but is delayed until May, then options with March

and April expirations will expire before the announced offer merger positively impacts the target's stock price. Therefore, there remains an element of speculation until immediately before the takeover is announced, even if the trader is in possession of non-public material information.

We can easily distinguish our work from the prior case studies. Although we cannot examine the detailed intraday transactional data in the equity markets available to Cornell and Sirri (1992), we can identify the date and magnitude of the option transactions that were found to be insider trading in the HJ Heinz case and can compare to transactions in the options of other firms including the Kraft acquisition. The option market is a logical place for insider trading to take place because of the leverage benefits to the trader, and Augustin, et al. (2015) document pervasive informed trading activity in equity options before acquisition announcements. We can also examine contemporaneous activity in the equity markets and can compare that activity to other similar transactions. Unlike the Bekaert case in Engelen (2006), the information about the impending takeover offer in our transactions has significant value-relevance to anyone with knowledge pre-announcement, as both HJ Heinz and Kraft have significant stock price increases at the announcement of the acquisition.

The Heinz Option Contracts Example

On February 15th, 2013, the SEC filed an insider trading complaint against "Certain Unknown Traders" regarding "highly suspicious trading in call option contracts". The complaint (*SEC v. Certain Unknown Traders in the securities of HJ Heinz Company*) identified the purchase of 2533 Heinz June 2013 \$65 call option contracts for a Goldman Sachs Swiss bank account on February 13th. The traders paid \$40 per call contract (quoted at $\$0.40 \times 100$ shares per contract), which gave them the option (per contract) to buy 100 shares of Heinz stock for \$65 per share. The next day, February 14th, Berkshire Hathaway Inc. and 3G Capital Partners announced the acquisition of HJ Heinz Company for \$72.50 per share, approximately 20% above the firm's closing share price of \$60.48 on February 13th. After the announcement, the call options traded at \$733 per contract (quoted at $\$7.33 \times 100$ shares per contract). This advantageously timed call option purchase resulted in a one-day return of 1733%, not including transaction costs.

It was announced on April 2nd, 2014 that Michel and Rodrigo Terpins would pay \$3 million in fines and give up \$1.8 million in profits as the "Certain Unknown Traders" in the Heinz option insider trading case. The Terpins,

whose family owns department stores in Brazil, allegedly were tipped that investment firm 3G Capital, founded by a trio of Brazilian billionaires, was helping Berkshire in talks to acquire Heinz. The legality of the Terpins' trade was called into question by the facts outlined in an October 10th, 2013 SEC filing (*SEC v. Michel Terpins and Rodrigo Terpins, 13 Civ. 1080* (2013)). The trade was characterized as "highly suspicious" due to being the first time Heinz securities were purchased, the first time call options were purchased for this account, and the Brazilian connection between 3G Capital, the Terpins, and Alpine Swift, the corporate entity that owned the account used to trade the options. Based on the information collected on the Terpins, it appears this insider trading case was both unethical and illegal.

Interestingly, there was other activity in Heinz call options before the Berkshire announcement that could also have been viewed as unethical or illegal insider trading. There were over 100 people working for multiple companies who knew that Berkshire and 3G partners were negotiating with Heinz on the acquisition beginning December 2012 (Nixon 2014). In addition to this private information, there were at least three articles that mentioned the potential for Berkshire to acquire Heinz starting in May 2012. Finally, Heinz had three earnings announcements starting in May 2012 before the announcement on February 14, 2013. Here are some significant 'out of the money' Heinz call contract transactions with material information releases included:

April 9th, 2012	Heinz stock closed at a price of \$52.98/share; the average share price year-to-date was \$52.81
April 10th, 2012	12,605 January 2014 60 call option contracts were traded (open interest increased from 110 to 12,625 contracts)
May 7th, 2012	Alex Shek, on Benzinga.com, wrote an article suggesting Berkshire may be considering possible acquisitions. Heinz was second on the list (this was the first mention linking Berkshire and Heinz that we could find beginning in 2011)
May 10th, 2012	13,542 January 2014 60 call option contracts were traded (open interest increased from 12,746 to 26,137 contracts)
May 24th, 2012	Q4 2012 earnings release
June 1st, 2012	2750 January 2014 65 call option contracts were traded (open interest increased from 4843 to 7410 contracts)

August 29th, 2012	Q1 2013 earnings release
October 24th, 2012	The Financial Times publishes an article “Buffett looks for big-ticket acquisition”, Heinz was mentioned as a possible target
November 15th, 2012	880 June 2013 60 call option contracts were traded (open interest increased from 163 to 1018 contracts)
November 20th, 2012	Q2 2013 earnings release
January 11th, 2013	3003 January 2014 60 call option contracts were traded (open interest increased from 16,151 to 19,152 contracts)
January 13th, 2013	Sammy Pollack, on Seeking Alpha, published an article titled “HJ Heinz Co: A Good Fit For Berkshire”
January 24th, 2013	2008 June 2013 60 call option contracts were traded (open interest increased from 2700 to 4697 contracts)
February 13th, 2013	2593 June 2013 65 call option contracts were traded (open interest increased from 364 to 2626 contracts)

What can we conclude about the derivative activity leading up to the Berkshire announcement? Over 26,000 January 2014 60 call contracts were traded around the first published story linking Berkshire and Heinz; a significant amount of volume given prior open interest and the amount of time between the transaction dates and the expiration date of the contract. These trades could have been based on non-public private information or speculation. However, due to the nine-month lag between the trades and the announcement, these trades did not appear to register on the SEC’s illegal insider trading radar. Other option transactions prior to February 13th could be argued to have been based on illegal insider trading, but the activity likely does not stand out to regulators as being as suspicious. In addition, the further removed a trade is from the announcement, the more speculative the transaction appears regardless of use of insider information. Even if a trader has possession of material inside information, the earlier he or she transacts before the announcement, the higher the probability that something could delay or derail the merger announcement to beyond the maturity date of the option contract.

Regulators’ perceptions regarding the legality of these call option contract trades are likely conditioned on timing and the relative size of the trades. For example, a trader could have learned of the Berkshire–Heinz negotiations in December. There were 659 January 2014 60 call contracts purchased on December 14th, 2012 at a price of \$2.30.

Since there were already 15,872 contracts open, these new contracts do not stand out as abnormal. The transaction date was 2 months before the acquisition announcement, so there is no suspicion of illegal insider trading based on the timing of the purchase. Possibly by coincidence, 689 contracts were sold the day after the announcement, on February 15th, 2013. If the contracts purchased in December were sold the day after Berkshire’s news, the trader would have realized a profit of over \$651,000 ($(\$12.60 - \$2.72) * 100 * 659$), less transaction costs, without generating any suspicion. Thus, what activity stands out as abnormal to the point it is detected by regulators?

The Kraft Options Contracts Example

An interesting comparison to the Berkshire–Heinz insider trading case emerged 2 years after the Berkshire–Heinz deal when Heinz announced that it would acquire and merge with Kraft Foods. If regulators were to examine the call option trading activity prior to the Heinz/Kraft merger announcement would they find similar trades as those that occurred prior to the Berkshire/Heinz announcement?

On March 24th, 2015 both the Wall Street Journal and The New York Times reported 3G Capital was in advanced negotiations with Kraft to merge with Heinz. The next day, March 25th, the deal was confirmed. A timeline with relevant media articles and selected option activity (for brevity just the June call contracts are used) follows:

May 6th, 2014	Bloomberg’s Tara Lachapelle and Will Robinson reported that Heinz might target Kraft Foods, along with other firms, based on comments from Warren Buffett of Berkshire Hathaway
January 6th, 2015	Kraft’s closing price was \$61.86 per share; the average share price, over the last year, was \$57.26
January 7th, 2015	The Wall Street Journal reported 3G Capital might be looking at Kraft Foods as a potential merger target for Heinz
January 15th, 2015	847 June 2015 65 call option contracts were traded (open interest increased from 1247 to 1908 contracts) 649 June 2015 67.50 call option contracts were traded (open interest increased from 66 to 643 contracts) 1130 June 2015 70 call option contracts were traded (open interest increased from 272 to 1217 contracts) 172 June 2015 72.50 call option contracts were traded (open interest increased from 0 to 172 contracts)

February 5th, 2015	4025 June 2015 65 call option contracts were traded (open interest increased from 2756 to 6202 contracts)
February 12th, 2015	Kraft announced Q4 earnings, $-\$0.68$ vs. expectations of $\$0.73$, and executive leadership changed (CFO, COO, and CMO)
March 10th, 2015	15,629 June 2015 67.50 call option contracts were traded (open interest increased from 5382 to 18,106 contracts)
March 23rd, 2015	692 June 2015 65 call option contracts were traded (open interest increased from 8864 to 9417 contracts)
March 24th, 2015	Numerous sources reported Heinz and Kraft in 'advanced' talks to merge
March 25th, 2015	Formal announcement of the Heinz/Kraft merger valued at approximately $\$77.83$ /share for Kraft shareholders

What can we conclude about the derivative activity leading up to the Heinz/Kraft announcement? More than 8 months after the first story linking Heinz and Kraft, and over one week after a follow-up story, there was a significant increase in the open interest of four different Kraft option contracts on January 15th. Again, the perceived ethical implications of these call option contract trades are subjectively conditioned on timing and the relative size of the trades.

The relative size of these transactions was large; however, due to when these transactions fell in the timeline between May 2014 and late March 2015, they appear to have been motivated by speculation, not non-public information. The March 10th transaction was two weeks before the announcement. Even though the relative size of this transaction was very large, the timing of the transaction reduced the suspicion of illegal and unethical behavior. The transactions on March 23rd occurred the day before the announcement, so the timing could suggest insider trading activity. However, the relative sizes of the transactions, based on previous activity, do not appear to be large enough to generate regulatory interest.

Unlike the Terpins transactions, the Kraft June 2015 option activity did not have both the large relative size and a close enough proximity to the release of the material information to arouse suspicion of unethical trading. Using different ethical filters, virtue, deontological, or rights-based, becomes entirely subjective with these trades because they did not pique the interest of regulators. However, the profits (assuming the contracts were closed on March 25th) from the combined January 15th transactions could have exceeded $\$2.9$ million [(March 25th closing price less purchase price) \times 100 contracts \times (Purchase date open interest less previous day's open

interest)]. The February 5th transaction could have potentially earned a trader a $\$4.7$ million profit. The March 10th transaction may have earned someone over $\$20$ million. Finally, the March 23rd transaction could have added almost one million dollars to a trader's account. Nevertheless, we cannot assess the ethical use of information within these Kraft option transactions because the lack of SEC enforcement in these cases suggests that no illegal behavior was detected.

Additional Analysis of Option and Equity Volume Data

In this section, we perform additional analyses related to the option data for the two firms and also examine the contemporaneous volume in the equity markets for these firms and a sample of large acquisition targets. We first analyze Heinz and Kraft call option data based on the approach of Cao et al. (2005), focusing on two out-of-the-money contracts for each firm that were or were likely to have been contracts used by a trader with information about the impending acquisition announcement. Second, we examine abnormal equity volume levels and returns for Heinz, Kraft, and our sample of acquisition targets in the period prior to the takeover bid announcement. Finally, we analyze call option trading activity for the broader set of acquisition targets using similar out-of-the-money contracts as above.

Given that we are looking at one event with confirmed insider trading and we do not have access to individual trade data in the options markets, we modified the approach of Cao et al. (2005) to fit our data. We calculate return, bid/ask spread, and volume data of the four Heinz contracts referenced in the timeline above. With the takeover announcement date as day 0, we define the benchmark period as day -75 to day -31 and the preannouncement period as day -30 to day -2 . We only go back 75 days from the announcement, rather than 200, because the June 2013 65 call contract did not come into existence until late October 2012. In addition, we stop the preannouncement period at day -2 , rather than day -1 , because the Terpins' transaction occurred on day -1 .

Volume imbalance is defined as the difference between buyer- and seller-initiated volume divided by the average volume over the benchmark period, as it is in Cao et al. (2005). Since we do not have trade-level data, buyer-initiated volume is defined by day rather than by trade. A 'buy' ('sell') day is one where the closing price is higher (lower) than the previous day's closing price. If the price has not changed from the previous day, then if the closing price is greater (less) than the day's midpoint between the bid and the ask then that day's volume is defined as buyer-initiated (seller-initiated). Our definition is not as specific

as Cao et al. (2005), but it does attempt to characterize the market pricing trend as accurately as possible.

The summary statistics in Table 1 provide some expected results and a few surprises. The most liquid contracts of the four were, as expected, the lower strike prices that were closer to being in-the-money. The June 60, with 62 days of trading, or the January 60, with over 400 contracts traded, on average, over its' 54 trading days. The June 60 contract had the only significant change in liquidity from the benchmark to the preannouncement period. The almost 2% difference in bid/ask spread between the two periods is significant at the 1% level. The June 65 calls were, by all measures, the most illiquid of the four contracts; with fewer trading days, less volume, and higher bid/ask spreads. Thus, this contract's illiquidity made it easier for the SEC to identify the possibility of unethical and illegal insider trading.

Obviously, whichever Heinz call contract the Terpins decided to use, their purchase of 2533 call contracts would have stood out to regulators. However, if they would have developed a trading strategy of buying the more liquid 60 strike contracts and in smaller amounts during the weeks leading up to the takeover announcement, then the ethics and legality of their transactions may have never been questioned. They would have taken on more monetary risk with this strategy, but they may have significantly cut their risk of being caught. The one constant would have been the ethical content of the Terpins' actions, which regulators may not have questioned with smaller trades spread out over a longer period of time.

The summary statistics, reported in Table 2, for four June 2015 Kraft call contracts provides a useful comparison and contrast to the trading activity in the Heinz call contracts. The main constant is that a deeper look at the trading of option contracts does not clear up the ethical picture unless trades are relatively large and possess impeccable timing.

The underlying stock had similar starting and ending points over the 74 trading days examined—Heinz \$56.92 to \$60.88 & Kraft \$59.70 to \$62.12. However, Kraft's stock had roughly double the volume of Heinz over this time frame, Kraft had a negative earnings report during the study period, and Kraft's takeover announcement was made almost a month and a half closer to the call expirations of the June contracts than Heinz's announcement.

Kraft's June 65 call contract is closest in moneyness to Heinz's June 60 contract used by the Terpins As with the Heinz contract, the bid/ask spread significantly narrowed, volume imbalance switched from negative to positive, and open interest increased over time. However, the returns turned negative in the preannouncement period for Kraft due to the negative earnings announcement in February. Interestingly, there were a few significant volume days in the preannouncement period that were buyer-initiated during a time of the price of the contract declining from \$1.30 to \$0.80 during the two weeks prior to the merger announcement with Heinz. There were three buying-dominated days with an aggregate volume over 3000 contracts in the two weeks prior to the 65 call contract jumping to \$18.00/contract on the announcement day. However, none of the transactions appeared to be large enough to question their ethical and legal nature.

The Kraft June 67.50 call contract is similar in moneyness to the Heinz June 65 call contract that the Terpins used for their illegal insider trade. The preannouncement period for the 67.50 call stands out because of the increase in volume, buyer-volume imbalance, and open interest from the benchmark period while the average daily return over the 29-day period was negative. The value of the contract declined from \$2.90 on February 10th to \$0.56 on March 23rd. However, on March 10th 15,629 contracts were purchased (accounting for 60% of the total volume over the preannouncement period), and the price closed at

Table 1 Summary statistics for Heinz call contracts

	Trading days	Means			Volume imbalance (%)	Open interest
		Bid/ask spread (%)	Daily price change (%)	Volume		
June 2013 65 (−75,−31)	16	33.31	3.25	10	−0.16	45
June 2013 65 (−30,−2)	16	35.52	5.97	17	0.04	229
Jan 2014 65 (−75,−31)	17	17.06	−0.94	35	1.31	7533
Jan 2014 65 (−30,−2)	22	16.08	1.26	74	3.67	7716
June 2013 60 (−75,−31)	37	9.88*	0.34	58	−6.36	931
June 2013 60 (−30,−2)	25	8.05*	2.91	132	17.13	3610
Jan 2014 60 (−75,−31)	32	8.43	0.64	492	−71.98	24,829
Jan 2014 60 (−30,−2)	22	8.64	1.55	419	5.63	15,979

* Equals *t* test for differences of means significant at the 1% level

Table 2 Summary statistics for Kraft call contracts

	Trading days	Means			Volume imbalance (%)	Open interest
		Bid/ask spread (%)	Daily price change (%)	Volume		
June 2015 65 (-75,-31)	36	16.57*	9.07	215	-11.60	1667
June 2015 65 (-30,-2)	29	8.37*	-3.45	225	4.22	7414
June 2015 67.50 (-75,-31)	22	12.48	8.43	72	0.26	621
June 2015 67.50 (-30,-2)	29	10.71	-4.44	899	24.99	8398
June 2015 70 (-75,-31)	33	22.12	9.29	204	-11.29	1678
June 2015 70 (-30,-2)	29	19.27	-4.63	147	18.22	4606
June 2015 72.50 (-75,-31)	16	16.77*	1.13	132	0.07	1516
June 2015 72.50 (-30,-2)	15	34.67*	-4.47	36	0.39	1885

* Equals *t* test for differences of means significant at the 1% level

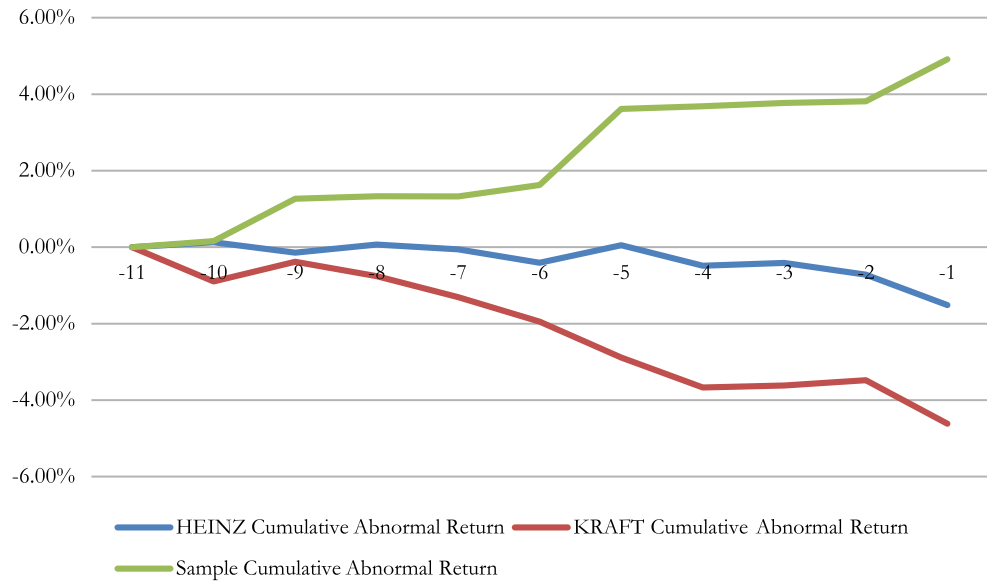
\$0.80 (a 14% increase over the previous day). The price of the 67.50 call contract closed at \$16.90 the day after the Heinz/Kraft merger announcement, a 2013% return earned on the contracts purchased on March 10th. The unrealized profit as of March 26th was approximately \$25 million for the 15,629 contracts. If these contracts were purchased by one individual they would have earned a profit over ten times greater than the Terpins. However, we could not find a report where the March 10th 67.50 call contract transaction was scrutinized for illegal and unethical behavior. Therefore, it appears that the magnitude and timing of the transaction was insufficient to raise regulator suspicion or the SEC investigated the trade and decided not to pursue it further. This trade stands out as abnormal relative to other trades in this contract; however, the timing of the trade was far enough from the merger announcement that it likely could have been viewed as a speculative bet on a forecasted M&A transaction.

As with the trading in Heinz call contracts, there could be multiple instances of traders using non-public material information to their favor. However, the transactions were small enough in volume and had enough distance from the news on February 14th to generate suspicion. The Terpins made the SEC's task of uncovering illegal insider trading easier with the size and timing of their trade. This, coupled with the additional information that the account trading the Heinz options had not previously conducted this type of derivative transaction, assisted in the SEC's case. The potential unethical nature of the Terpins' trade included abnormal signals in timing, size, and uniqueness, all helpful to the SEC in its efforts to uncover illegal and (possible) unethical trades.

While the option markets are likely places to trade on inside information given the potential leverage benefits discussed above, it is also possible that individual traders with private information would trade in the equity markets. In order to more closely examine the parallel activity in the

option and equity market during the period immediately prior to the announcement of the acquisition, we collect information about the volume in both of these markets. We collect stock volume information for Heinz, Kraft, and a constructed sample of other large acquisitions of US companies that occurred during this time period. Using the Mergers and Acquisitions database from SDC Platinum (SDC), we identify all completed transactions announced between January 1, 2013 and December 31, 2015 in which the target was a public company, and the acquiring firm went from a position of owning less than 50% of the target's shares before the transaction to owning greater than 50% of the target after completion of the transaction. Because we want to identify target firms that may have actively traded options, we focus on the largest transactions by also restricting our sample through a requirement that the value of the transaction was greater than \$15 Billion. We also require at least 90 days of valid stock return and volume information prior to the announcement of the acquisition, which we obtain from the Center for Research in Security Prices database. We find 22 transactions meeting these criteria, including the acquisition of HJ Heinz and Kraft. The median size of the deal for the sample (HJ Heinz) is \$22.3 Billion (\$23.5B), and the median one-day premium to the stock price at announcement reported in SDC is 30.77% (19.87%). The HJ Heinz transaction is similar in size to the other acquisitions; however the average premium paid in the other transactions is higher than the premium received by the Heinz shareholders. We also review the SEC Litigation Releases to verify that to date, no insider trading charges have been brought forth in any of the other cases.

We use Factiva and the Dow Jones News Retrieval Service to verify that the announcement dates listed in the SDC database correspond to the announcement of the subsequent acquisition of the firm. While the announcement dates typically reflect a significant return to the target

Fig. 1 Cumulative abnormal preannouncement returns

firm shareholders, we also observe that in many cases rumors or discussions of the takeover were evident prior to the announcement date and stock prices and volume had already begun to increase prior to the announced acquisition.

Figure 1 shows the cumulative abnormal returns for HJ Heinz, Kraft, and the average for the sample of 20 remaining firms in the 10 days prior to the announcement of the acquisition.³ While no run-up in stock price is observed for Heinz and Kraft, the average cumulative abnormal return for the other 20 firms in the sample is over 3% in the two weeks prior to the announcement. While this run-up would be consistent with individuals trading on inside information, we cannot infer that is the case given the absence of observed enforcement cases.

As a measure of abnormal volume for each firm's equity, we follow the standard event study methodology and estimate a predicted volume or expected level of trading based on a regression model of the firm's volume on the overall volume of shares traded on the New York Stock Exchange. The estimation window ranges from 90 trading days prior to the announcement (−90 to −30), and the event window is defined as the 10 trading days prior to the announcement (−10, −1). We find that there is significant positive abnormal trading in the equity markets for 6 of the 20 sample firms during the run-up period, but the cumulative abnormal volumes for both Heinz and Kraft are not significantly different from 0 during this period. We present the abnormal equity volume as a percentage of outstanding

shares during the two weeks prior to the takeover announcement in Fig. 2. Given this is abnormal volume relative to the estimation period, a measure of 0 would reflect normal volume. Consistent with the preannouncement run-up observed in the stock price, the average of the sample of 20 firms also demonstrated abnormal volume during the entire week prior to the announcement. With the observed rumors and speculation of upcoming takeover bids in many of these other cases, it is challenging, if not impossible, to differentiate between abnormal volume and price run-up due to the expectations forming in the marketplace as opposed to a result of unethical or illegal insider trading.

For the additional sample of merger and acquisition targets, we also collect trading activity in call contracts expiring 120 days after merger announcements (similar to the Heinz analysis) and 90 days after merger announcements (similar to the Kraft analysis). We confine our analysis around out-of-the-money options (strike price-to-stock price of 80–95%) for two reasons. First, these were the moneyness contracts most often used in preannouncement option trading of expirations greater than 60 days according to (Augustin et al. 2015). Second, the call contract used by the Terpins was in this range of moneyness. The benchmark period prior to the announcement was shortened to −60 to −31 days due to low trading volume in most of the contracts. Even with this change, we only find six of the twenty merger events with enough contract trading to be included in the analysis. With these additional cases, we will analyze if there are trades of significant magnitude and timing that were not detected as illegal and unethical occurring prior to the acquisition announcements.

The results in Table 3 show preannouncement activity in these 120-day call contracts resembling speculative

³ The Cumulative Abnormal Returns were computed using a standard market model with a benchmark period of daily returns from 90 days before the announcement to 30 days before the announcement.

Fig. 2 Abnormal preannouncement volume as a percentage of O/S shares

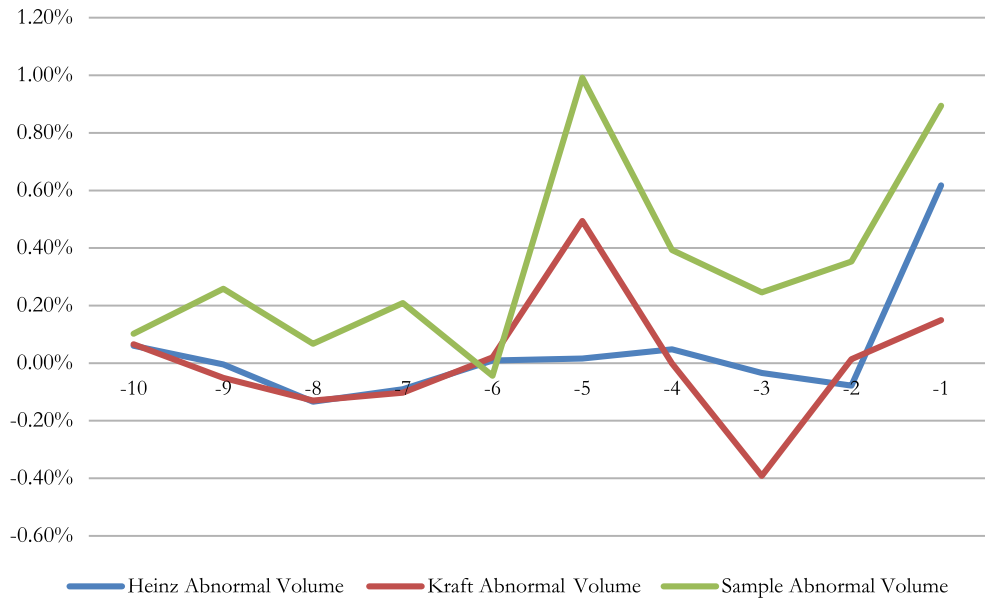


Table 3 Summary statistics for 120-day call contracts

	HNZ	LIFE	DTV	ALTR	MWE	PCP
Average benchmark (−60,−31) volume	11	42	42	438	1803	53
Volume % of stock volume	0.07%	0.24%	0.09%	0.00%	0.22%	0.00%
Average preannouncement (−30,−1) volume	179	83	198**	724	332	13*
Volume % of stock volume	1.11%	0.47%	0.46%	0.01%	0.04%	0.00%
Average benchmark return	−9.7%	9.9%	−12.3%	15.6%	−2.3%	−5.4%
Average preannouncement return	8.9%*	40.8%	20.4%**	−2.5%**	−11.5%	0.3%
Volume imbalance benchmark	0.02%	−1.02%	−0.53%	−2.18%	−222.83%	20.50%
Volume imbalance preannouncement	15.18%	−2.64%	−6.06%	14.92%	30.82%	1.80%

Significantly different than the Benchmark period at the 10% (*), 5% (**), and 1% (***) levels

trading with no red flags of potential unethical insider trading. Only the out-of-the-money DirecTV (DTV) contracts had significantly higher volume and daily returns in the month leading up to the merger announcement than the benchmark period. Volume imbalances prior to the merger announcements were both positive and negative with no clear trend. The Terpins’ illegal Heinz call contract trades, and the other potentially suspicious trades, fade into the averages Table 4.

Trading activity around 90-day call contracts of target firms was less liquid than the 120-day contracts, with only four of the twenty firms with enough volume to conduct analysis. However, we did find two of the four targets (Dell (DLL) and SanDisk (SNDK) with significantly higher volume in the month prior to the merger announcement. Interestingly, all three Dell contracts in this sample (strike prices of \$14, \$15, and \$16) lost 44, 60, and 80%, respectively, on the day of the private takeover. So this is at least one case where abnormal volume leading up to a

significant corporate announcement appears to be a speculative trade gone bad. The results were similar with the three SanDisk call contracts in the sample. The \$80, \$85, and \$90 strikes lost 34, 44, and 60%, respectively, on the announcement day. These two results do not provide the weight to question the value of abnormal volume analysis in detecting possible unethical behavior. However, these results do show that abnormal volume could also signal speculative bets that did not pay off, which would be consistent with traders acting on rumors in the marketplace.

Enforcement of Insider Trading Regulations

Engelen (2004) uses a real option approach to provide a framework for evaluating insider trading from the perspective of the trader holding the inside information. Because the individual has the *option* to act on the information (by trading illegally), any changes to parameters

Table 4 Summary statistics for 90-day call contracts

	DELL	FRX	KRFT	SNDK
Average benchmark (−60,−31) volume	51	388	251	33
Volume % of stock volume	0.00%	0.02%	0.01%	0.00%
Average preannouncement (−30,−1) volume	4171***	149	189	477**
Volume % of stock volume	0.02%	0.01%	0.01%	0.01%
Average benchmark daily return	−1.5%	16.4%	−3.9%	14.7%
Average preannouncement daily return	23.6%*	2.0%	−3.9%	36.8%
Volume imbalance benchmark	−0.14%	23.40%	−9.94%	0.34%
Volume imbalance preannouncement	−18.72%	−6.94%	−2.99%	0.98%

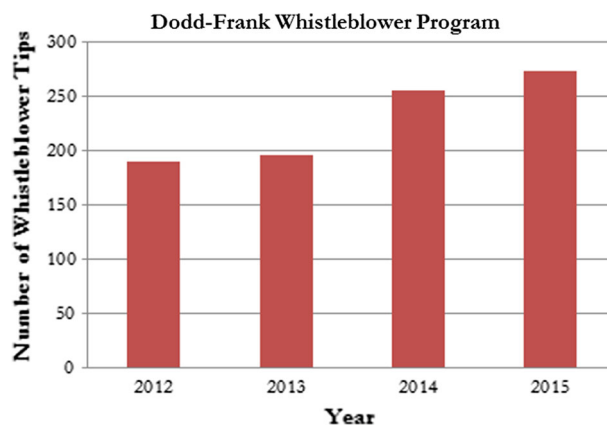
Significantly different than the Benchmark period at the 10% (*), 5% (**), and 1% (***) level

that affect the value of the underlying option will affect the decision to act. This framework is useful for evaluating the impact of enforcement and detection of insider trading.

Any enforcement strategy that effectively reduces the value of the option of insider trading should decrease the incentive to trade on the inside information. For example, increasing the cost of exercising the option through greater penalties or fines will reduce insider trading. Del Guercio et al. (2015) report that the punishment and fines associated with insider trading have significantly increased in recent years, which is consistent with an enforcement regime that has increased the exercise cost of the option to trade illegally.

In addition, an enforcement process that is consistent in how it investigates or handles suspicious trades will lower uncertainty for the trader, reducing the value of the option. In the analysis above, we have demonstrated how transactions that appear to be similar in nature can result in differential ultimate treatment by regulators. While the Terpins' trades were subject to SEC prosecution, other suspicious trades in the option market appear to have avoided prosecution. In addition, similar trades by activist investors in the option markets preceding takeover bids have sparked an interest by the SEC, but to date no insider trading cases have been brought forth. (*Flurry of Allergan Trades Preceded Bid*, (April 22, 2014)). Given shortcomings in the SEC's ability to detect and enforce insider trading activity consistently due to the nature of the circumstantial evidence from trading activity alone, resources targeted at increasing alternative sources of direct evidence would appear to be beneficial.

As one example, the Dodd–Frank Wall Street Reform Act of 2010 mandated the creation of the Office of the Whistleblower under the SEC. The Office of the Whistleblower provides monetary rewards to individuals who report information to the SEC that leads to SEC enforcement action of a certain magnitude. We report the number of tips related to insider trading that have been passed on from this office according to the 2015 Report of the U.S.

**Fig. 3** Whistleblower tips since 2012

Whistleblower⁴ in Fig. 3. The number of tips turned over to the SEC has increased each year from 2012 to 2015, which should provide the SEC with additional tools to detect and enforce insider trading laws. The SEC has also recently established a cooperation program with agreements that encourage witnesses to provide valuable information to the SEC.⁵

Ethical Analysis of Insider Trading and Enforcement

Returning to the ethical issues around insider trading and enforcement, option trading is generally a zero-sum game. There are few post-transaction gains or losses since derivative contracts are almost always bought to open and sold to close, meaning a contract is created at purchase and retired at sale by the same trader. The clearinghouse assumes the

⁴ <https://www.sec.gov/whistleblower/reportspubs/annual-reports/owb-annual-report-2015.pdf>.

⁵ Statement by Robert Khuzami, Director, Division of Enforcement U.S. Securities and Exchange Commission, Before the United States Senate Committee on Homeland Security and Governmental Affairs (<https://www.sec.gov/news/testimony/2011/ts120111rsk.htm>).

other side of the options transaction, to greatly reduce credit risk, but there is usually a seller to match with a buyer. Due to the appreciation in Heinz share price, the Terpins' gained roughly \$1.8 million and the writer (seller) of the contracts lost the same amount. Thus, consequentialism would not produce a verdict for regulators regarding the ethical nature of this transaction since the overall outcome of the trade was a net \$0. If we would rather measure outcomes by utility gained and lost in the transaction, then we would be entering a subjective argument where it would be difficult to agree on an objective measure of utility for both parties.

Determining the ethical implications of the Terpins' insider trading activity through a virtue filter becomes far more complex than the consequentialism/utilitarian argument. Since virtue is about doing the right thing, to the right person, in the right measure, at the right time, Sreenivasan (2002) sees too many factors in play. The probability of regulators correctly assessing virtue to a single observed action is extremely low, and the task is made more difficult since they do not know the Terpins' motives for their actions. A deontological approach would look at the rules and duties the Terpins were operating under when they bought the call option contracts. According to SEC regulations, it would be straight forward to make the case the Terpins misappropriated non-public material information with the goal of profitably trading on that information in the derivatives market. The evidence that the Terpins received the information from an insider within 3G is circumstantial. We could not find verification of the identity of the tipper and whether they had a fiduciary responsibility.

McGee (2009) stated that a rights-based approach to the ethics of insider trading may be best in a heterogeneous society like the United States "where different segments of society take different positions regarding what is ethical and what is not." Whoever has ownership of the information determines how the information is disseminated. The issue is determining the owners of information. This could be seen as a very Orwellian task for regulators; where legal and regulatory organizations sort through written, electronic, and audio communications to determine the original owner of a piece of information. The inherent subjectivity involved with the detection of unethical behavior is evident with the rights-based approach and those we mentioned previously. Whichever ethical lens regulators use, at the end of the day it all feels nearly impossible to detect unethical insider trading in the absence of a whistleblower.

Prosecution of insider trading events remains rather sparse. Although Del Guercio et al. (2015) report an increase in prosecutions that is correlated with the resources provided to the SEC, the overall number of insider

trading cases remains relatively small. One can observe both increased volume and run-ups in the stock price and option markets prior to the announcement of acquisitions; however, almost all of these trades do not result in an insider trading prosecution. While insider trading may have occurred, the SEC is limited in bringing only those cases to which it believes it can prosecute the case, meaning that it likely has additional information from a whistleblower or evidence of significant activity and suspect timing. Given the problems with prosecuting these cases, a question arises as to the appropriate boundaries. Whether an individual trade is illegal requires a complex and often confusing analysis, which leaves the ethical question as an important one.

Conclusion

In this paper, we reviewed over twenty recent acquisition events similar in size; two in greater detail. Only one case of illegal insider trading occurred. Regulators needed a large well-timed transaction to draw suspicion and a whistleblower to make their case. Otherwise, these transactions, as well as many others, blend into speculative noise that makes it difficult for regulators to effectively determine legal and ethical behavior.

Detecting unethical insider trading, whether for the Terpins or others, is similar to the argument regarding market efficiency. Whether you argue for or against market efficiency, you will also need to argue for the asset pricing model you used to determine whether current market prices reflect an asset's 'true' market value or not. You want to concentrate your efforts on what you feel is the more important discussion, but you end up mired in the secondary discussion advocating for the assumptions you used in your asset pricing model. Along the same line, regulators want to have a discussion on the ethical implications of insider trading, but they will also have to argue whether or not illegal insider trading actually occurred, and the legal history of this argument is uncertain at best.

Even though the legal and ethical boundaries around insider trading continue to be vague and uncertain, enforcement of insider trading laws has been shown to have positive effects on markets through reduced costs of capital and improved liquidity. If we observe inconsistent treatment from the regulatory authorities for what appears to be similar behavior or trades, then the perception of fairness in the markets is affected and the benefits of enforcement may be limited. While analytical tools can be used to uncover suspicious trading activity, the evidence will still be circumstantial. Additional efforts or resources targeted at developing more direct evidence of insider trading can help maintain the market benefits of an active

enforcement program, even when legal and ethical questions related to insider trading are less certain.

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