An Event Study Analysis of the Nexen-CNOOC Takeover:

Implications for the Canadian Market

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Abstract : The CNOOC bid for Nexen was one of the most publicly scrutinized takeovers in Canadian history due to ambiguous language in the Canadian Investment Act. This paper aims to examine how the markets reacted to the lengthy bidding process. Performing an event study analysis on sectors of the Canadian stock market, using new information as a means to show abnormal returns in the different sectors, we can see how the takeover impacted the Canadian stock market sectors. As a proxy for new information, news articles and statements by various market influencers were taken from a Bloomberg terminal. The Bloomberg terminal also captured the daily stock market information for 170 companies over 166 days. Sectors that are more open to international investment, and considered backbone sectors, were more impacted than those that are mostly isolated from international pressures.

## Table of Contents


1-Introduction ........ 3
1.1-Why this deal is happening ........ 5
1.2-Nexen ........ 7
1.3-CNOOC ........ 8
1.4-Chinese Investment in Canada ........ 10
1.5-Net Benefit to Canada ........ 10
1.6-What does Nexen bring to China/CNOOC? ........ 12
1.7-Political Considerations ........ 13
2-Timeline ........ 14
3-Literature Review ........ 19
3.1-Event Study Method ........ 19
3.2-Efficient Market Hypothesis ........ 21
3.3-Mergers and Acquisitions (M&As) ........ 23
4-Methodology ........ 24
5-Data ........ 27
5.1-Traded Securities ........ 28
5.2-News Stories ........ 29
5.3-Analyst Ratings ........ 31
6-Results ........ 33
6.1-Backbone Sectors ........ 35
6.1.1-Energy ........ 35
6.1.2-Financials ........ 36
6.1.3-Technology ........ 37
6.1.4-Summary of Backbone sectors ........ 38
6.2-Auxillary Sectors ........ 39
6.2.1 –Communications ........ 39
6.2.2-Health ........ 40
6.2.3-Industrials ........ 41
6.2.4-Consumer Discretionary ........ 42
6.2.5-Utilities ........ 43

6.2.6-Materials ........ 44
6.2.7-Summary of Auxiliary Sectors ........ 45
7-Conclusion ........ 45
Appendix ........ 48
A-Comments By Politicians ........ 48
B-Variable List ........ 51
C-Regressions ........ 52
Bibliography ........ 60

## 1-Introduction

In late July 2012, CNOOC Ltd placed the largest bid for a Canadian company by a Chinese state owned enterprise, putting Nexen Incorporated in the middle of a national debate. This bid would put the debate over Canada's role in intervening in capital markets, and natural resources, front and center in the news and public dialog. Knowing this bid would likely set the precedent for all future deals, it was widely discussed and debated on media channels from CBC to Bloomberg Television. Canadian investment rules necessitated a review process, which would later prove to be very ambiguous, and this sparked political debate across North America. The current paper aims to quantify some of the market reactions due to the ambiguous nature of the Canada Investment Act and the debate that it spawned.

The majority of existent material focusing on mergers and acquisitions seems to examine these events as a group, not as individual cases. Considering the debate that occurred during the initial phase, it is shocking to find out that no publicly-available analysis has been undertaken on this topic. Not only is there no research, the debate gauged always seemed too broad; it never asked which industries would be impacted or how, simply stating that it was detrimental.  This paper aims to fill this gap for policymakers, business analysts, as well as Canadians whom are concerned with the impact of large scale takeovers on their economy. So the question this paper hopes to answer is: how did this merger process impact the Canadian economy, and more specifically, how did the process impact individual sectors? It will be difficult to ascertain the long term effects, as it has not yet been a year, but we can analyze what happened to the markets in the short term.  Taking each sector's returns individually, and controlling for the rest of the market forces, how does new information regarding the CNOOC Ltd. bid impact each sector?

By using different proxies for information, this paper demonstrates that some sectors were significantly impacted by new information, while others were mostly unaffected. Just as there is no magic lever to push to strengthen every sector of the economy, it is reasonable to assume that one event will not impact every sector the same way. Clearly, some sectors of the economy will be impacted more than others due to their linkages with local and foreign markets. For example, the energy sector is highly linked to international markets, because its prices and profits are dictated largely by foreign demand. The health sector, on the other hand, is mostly removed from international markets. If we look at the Canadian economy as a whole, we can single out a few sectors as crucial backbone sectors for both growth and innovation. A recent poll by Harris-Decima shows that 87% of Canadians believe the oil and gas sector is economically important, and 53% believe it is the most important sector in Canada (CBC 2013). Following the energy sector are the banking, manufacturing and high tech industries.

The recent bid for Potash Corp, which occurred a year prior to the case examined here and was rejected on the grounds that it did not pass the net benefit test, clearly drew comparisons to the CNOOC-Nexen case. The Potash bid, by an Australian firm, is said to likely have been vetoed due to significant Conservative party opposition. While Potash's failed bid was significantly different, as it held 40% of the world's potash supply, it showed that the bids were subject to political interference (Ljunggren and Palmer 2012).

There was substantial debate around the CNOOC bid from all political parties and interest groups. The concerns which were raised ranged from foreign state ownership of Canadian companies, key Canadian industries, and intellectual property, to human rights issues in China. Some argue that this fear has reached levels which are unreasonable, and the meteoric rise of China leaves others wanting to latch onto the growth.[1]

## 1.1-Why this deal is happening

Canada's oil production industry ranks third behind Saudi Arabia and Venezuela, and the country remains as one of the few net exporters of petroleum products. The province of Alberta supplies roughly 15 percent of the United States crude oil imports, and Canada supplies roughly 25 percent (Government of Alberta 2013). In Alberta, there are over 150,000 employees in the oil and gas industry, making it one of the most important sectors of the Canadian economy. It is estimated that one in 14 workers in Alberta is employed at a job directly related to energy (Government of Alberta 2011).

With oil being such a large driver of the Canadian economy, there are political ramifications to its extraction, use, and ownership. As with any natural resource, the debate over ownership will be intense in both the political and the public arenas. This debate is intensified further because the extraction process of the oil sands is commonly criticized on environmental grounds. Given the Chinese record on environmental issues, this debate is even further intensified.

The oil sands production is also only economically viable at high oil prices. The higher the price of oil, the more producers will be coming in to produce on the oil sands, and this is what we have been seeing in recent years. Alberta's economic forecasts indicate very large growth in the industry for years to come. There are approximately 170 billion (proven) barrels remaining in the oil sands and current production is about 1.7 million barrels a day (Province of

[1] For further elaboration on this topic, please see Appendix A, where selected quotes have been included.

Alberta 2012). Clearly, there is still a large opportunity for growth in this sector, and this will inevitably attract suitors.

Unfortunately for Canada, there just are not enough independent firms that have large amounts of free cash to purchase large amounts of the oil sands, or companies operating within them, to keep it entirely Canadian-owned. Extracting oil from the oil sands is an expensive process, and it requires a large amount of capital expenditure. The vast majority of oil and gas firms operating in Canada have their headquarters within Canada, but many of them are foreign-owned, and half of the revenue goes to foreign entities (Souza 2012). Admittedly, much of the ownership is due to open market transactions and these owners are largely from the United States.

Chinese National Offshore Oil Company (henceforth referred to as CNOOC) formally announced its intent to purchase Nexen Incorporated (henceforth referred to as Nexen) in late July 2012 for approximately $15.1 billion, making it the second largest takeover in Canadian history. After an unsuccessful attempt at purchasing Unocal, an American oil and gas company, CNOOC set its sights north on Nexen.

If CNOOC were an American or European company, the debate over the fate of Nexen would likely be less intense. But because CNOOC is a state owned enterprise (SOE), there are additional concerns about its intentions in Canada. Whether these concerns are founded in fact or not, investors and speculators will likely give some credence to them when making financial decisions.

Comparing the ownership of the Americans and the Chinese is by the fact that CNOOC purchased the companies outright, while the American firms have fractional ownership. More recently, with Blackberry's shares plummeting in value, and the firm looking for strategic alternatives, there have been a few mentions in the media about Lenovo (a Chinese computer firm) being blocked in their attempts to acquire Blackberry due to national security concerns (Chase and Erman 2013).

In these times, people are looking towards the Prime Minister and his office (PMO) for clarification or any guidance as to what the deal will net, as it is well-known around Ottawa that Stephen Harper likes to 'keep a tight leash' on his cabinet (Delacourt 2013). Investors will try and gain insight from information being announced through the PMO in order to determine their investment decisions.

## 1.2-Nexen

Nexen dates back to the formation of Canadian Occidental Petroleum (CanOxy) in 1969; CanOxy was renamed Nexen Inc. in 2000. They were originally 80% owned by an American firm, Occidental Petroleum, based in Los Angeles. Their operations were initially in Alberta and British Columbia, but eventually expanded to Yemen, the Gulf of Mexico, and the UK North Sea. At the time of the acquisition, only 28% of their production and 11% of their cash flow came from Canada.

As one of Canada's leading oil and gas companies, it frequently ranked around fifth or sixth in both gross revenue and oil barrels extracted (includes natural gas). This is not to say this company dominated the market; in fact, it produced less than half the oil produced by larger companies such as Suncor, CNRL, or Imperial Oil.

## 1.3-CNOOC

CNOOC was founded in 1999 and listed on the NYSE. It is China's largest producer of offshore crude and natural gas. It is considered a part of the 'big three' Chinese state owned oil and gas companies, the other two being China Petroleum and Chemical Corporation (Sinopec), and China National Petroleum Corporation (CNPC). China National Petroleum Corporation is China's largest oil producer, and Sinopec is the largest refiner of oil in China. CNOOC is relatively small compared to the three, but seems to be the most profitable with an operating profit margin of 34% in 2008 (International Energy Agency 2011).

Their reserves were traditionally around the China Seas, and before the acquisition they claimed to have approximately 3.5 billion barrels of oil equivalent[2]. As China's energy requirements grow along with their economy and population, they will need to acquire more oil for themselves. In 2005, they attempted to purchase the American company Unocal, but failed due to political action; it was eventually merged with Chevron[3]. This failed bid could be thought of as the reason for the firm setting its sights on Nexen, and increased the likelihood of a successful bidding process, because the firm had learned from past mistakes. The failed bid also did something else; it brought forward Chinese investment in energy markets into the public debate.

When discussing CNOOC, most people consider it to be simply an extension of the Chinese government; however, this has recently been brought into question by a report by the International Energy Agency (International Energy Agency 2011). Chinese National Oil

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[2] Barrels of Oil Equivalent, BOE, summarizes the amount of energy that is equivalent to the amount found in a battle of crude oil. This is done so oil and gas reserves can be combined into one figure.

[3] Technically, CNOOC withdrew its bid, but it was after a vote in the House of Representatives, just prior to President George Bush making a decision.

Companies (NOCs) have substantial independence and their business decisions have actually helped increase the global supply of oil and gas. In 2009, these three companies accounted for 13% of total global oil and gas acquisitions, and 61% of all acquisitions by national oil companies (International Energy Agency 2011).

The large amount of capital available in China makes these NOCs very good vehicles to channel investment abroad to capital-heavy projects, such as Iraq or the Canadian oil sands. The Chinese have the unique (for the moment at least) characteristic of having far too much capital building up, and the resultant need to continue investing outwards to sustain growth in their economy. With most other developed economies still struggling through the recent recession, this is a buyers' market for China.

It should also be noted that the three large NOCs, China Petroleum and Chemical Corporation (Sinopec), China National Petroleum Corporation (CNPC), and CNOOC, all are relatively young in comparison to most other oil and gas companies around the world. This puts them at a comparative disadvantage, because they would not have the same initial investments and experience in the oil and gas industry as other companies; in essence they lack institutional memory.

Historically, Chinese companies have invested predominantly in "unstable, corrupt, energy-rich countries that allow the NOCs to operate with a low level of competition from other International Oil Companies (IOCs)" (Wolfe and Tessman 2012). While this is a harsh assessment, it might be a fairly accurate description of what the public thinks of Chinese investment.

## 1.4-Chinese Investment in Canada

China's export led growth model has created a surging giant that requires more resources to continue growing, such that about half of their current foreign direct investments (a total of 14$ billion) are in resources.  Before the CNOOC-Nexen deal, most positions they held in Canada were minority positions, allowing them to avoid political issues (Fear the Dragon – Conference Board of Canada). In a survey done by the Conference Board of Canada of Chinese investment intentions, it was revealed that 56% of respondents were interested in setting up sales channels in Canada, but only 10% were looking at setting up manufacturing in Canada.

The natural question to ask is whether it is a good idea to allow them to continue increasing investment in Canada. If they are just investing in Canada to attain our resources and technology, do we take their money and allow this? This is not a simple question, particularly in the case of the oil industry. Oil and gas are publicly-traded goods, and while the Chinese would like to see much of it go to China to fuel their own consumption, they will also sell it locally.

## 1.5-Net Benefit to Canada

The current bid entered into the political spectrum because of the Investment Canada Act. This act has been widely criticized as very vague, so quoting from the website of Industry Canada, the act was created:

"To provide for the review of significant investments in Canada by non-Canadians in order to ensure such benefit to Canada".

Investments will trigger review if the asset being acquired meets various criteria. Specifically:

- if the country is a non-WTO investor, the maximum amount without a review is 5$ million for direct acquisition and 50$ million for indirect.
- if the country is a WTO investor, the maximum amount is $344 million

If either of these limits has been surpassed, as CNOOC did with its $15.1 billion bid, then the Minister of Industry has 45 days to determine whether or not to accept the deal, with a potential 30-day extension.

However, the idea of "net benefit" is easily quantifiable. According to the Industry Canada website, the minister will consider six factors:

1) the effect on the level of economic activity in Canada on employment, resource processing, utilization of parts and services produced in Canada, and exports from Canada;
2) the degree and significance of participation by Canadians in the Canadian business or new Canadian business and in any industry or industries in Canada;
3) the effect of the investment on productivity, industrial efficiency, technological development, product innovation and product variety in Canada;
4) the effect of the investment on competition within any industry in Canada;
5) the compatibility of the investment with national industrial, economic and cultural policies; and
6) the contribution of the investment to Canada's ability to compete in world markets.

None of these factors are easily quantifiable, and there was much criticism in the press of the lack of transparency in the process. Eventually the acquisition was allowed, with no explanation, but the government stated that similar deals in the future would be held to some higher form of scrutiny (Industry Canada 2013).

## 1.6-What does Nexen bring to China/CNOOC?

We can look at the bid for Nexen as both a financial and political one. To begin with it improves the public image of China and Chinese investment. Over 90% of Nexen's reserves are in OECD countries and Nexen does not have any glaring stains against its reputation. As mentioned before, a large number of China's NOC investments are in developing economies, which can reinforce the human rights complaints against China.

Diversification of oil producing locations is critical to mitigating the negative impact of supply shocks on the economy. By establishing a foothold in the oil sands, as well as entry into both the Gulf of Mexico, and the North Sea, China has effectively created a global energy supply.

A North American hub has now been acquired for CNOOC. Some centralized control/management of North American operations can be performed out of Calgary, as well as existing Nexen offices in the Gulf of Mexico and North Sea. Having more of a presence in one of the most oil abundant countries in the world is surely important in maintaining relations with them and thus a steady supply line.

As mentioned earlier, CNOOC, and most of the NOCs for that matter, are fairly young companies. By acquiring Nexen, with over 50 years' experience in a variety of oil and gas production regions, they are dramatically increasing their institutional memory.

It must be mentioned, that this deal was considered to be a drastic overbid for Nexen, and if we look at the stock price of CNOOC, we can see a stark drop after the announcement date. It received a lot of criticism at home and abroad for its decision to pay a 61% stock premium for Nexen.

## 1.7-Political Considerations

There are a number of non-quantifiable aspects regarding the success or failure of the CNOOC-Nexen deal. To begin with, there would certainly be a negative reaction from the Chinese, as demonstrated in the Wan and Wong (2009) paper as well as by the response to the Unocal case in the United States. There would surely be retaliatory actions against Canadian companies and industries, as happened in the case of the blocked bid on Unocal.

It is entirely speculative, but because of the improved relationship with China, as a result of deals like the CNOOC-Nexen, that Canada, specifically Toronto, is going to be a hub for trading the yuan before the United States (Altstedter 2013). The rapid expansion of China and Chinese goods and services being sold across the world certainly gives credence to those that think the Yuan might replace the American Dollar one day as the world's primary reserve currency. At the very least, the Yuan might soon overtake the Euro, and having Toronto as a trading hub will certainly give more power to the TSX.

The failure of the Keystone XL pipeline that was due to send oil to the United States also forces the hand of the Canadian government to sell it then to China, who are the second largest consumer of oil after the United States. CNOOC has recently proposed building a large liquid natural gas pipeline through British Columbia (Lewis 2013).

The relative strengthening of the Asian region versus the United States, which has nearly 80% of our exports, should make Canada want to diversify its trade relationships. While Canadian banks were not exposed to the same risk as American banks, and thus were not severely damaged, the Canadian economy at large still was greatly affected by the fact that the United States was severely impacted. It is debatable whether diversifying the economy of Canada to include China would protect it more, because China might have a crisis as well. But since there is a growing market in China, Canada should be proactive and try to supply more of its growth to increase exports to China.

A fairly common argument against SOEs, or any foreign companies, acquiring companies at home is the concern that foreigners may take over the native workforce. In this case, Nexen employs about 3000 workers worldwide, and the majority of the operations are done abroad, meaning that few Canadian citizens will be displaced from a job.

## 2-Timeline

The timeline for the CNOOC bid begins in 2011, with CNOOC purchasing OPTI Canada for $2.1 billion on November 28. OPTI had a very strong working relationship with Nexen, effectively operating alongside them on most projects. This can be seen as the first step into acquiring Nexen, basically making it a smaller company to take over. CNOOC might have realized that taking over large companies was a political error; acquiring smaller pieces over time would reduce the impact of the end result on the local political scene. However, this is not included in the analysis, because it would have been a very risky bet to assume that Nexen was eventually going to be taken over. What follows is a timeline of the major events, as well as some smaller, but important events[4].

On Monday, July 23 2012, CNOOC announced its intention to purchase Nexen, at a bid price of $27.50 Canadian, which constituted a 61% premium on their closing price the previous Friday, for a total bid of approximately $15.1 billion. The acquisition would increase CNOOC's output of oil by approximately 20%.

Over the next week, this would be the piece dominating the news cycle of most business news, as it would be the largest acquisition deal ever for both Canada and China. The Canadian government announced they would be actively reviewing the case under the Investment Canada Act. The Chinese government announced it would be actively pursuing more energy projects abroad to secure more energy for their growing economy. This was also accompanied by a 4% decrease in CNOOC shares, since investors believed the 61% premium on the share price was far too high.

On July 30th, Congressional Democrats in the United States begin speaking of potentially stalling the deal, claiming that the United States wanted more concessions from China. At the same time, this could unnerve the Canadian market due to potential repercussions for dealing with China and loosening ties with the United States (Snyder 2012).

On August 7th, further speculation hit the news wires with more questions regarding the United States, as well as how CNOOC would treat Nexen's debt, which was standing at $4.3

[4] This is described in more detail below, but in brief; major events are defined as news that either directly relates to the investors actions or by decision makers (Harper, Paradis). There were many analyst reports and pundits discussing the deal on days without real decision makers' input, such as what was written on Aug 7.

billion. CNOOC states it will assume Nexen's debt, but does not elaborate on whether the bonds will be guaranteed by CNOOC assets. Additionally, Nexen's investment rating is Baa3 by Moody's Investors Service, while CNOOCs is Aa3, a difference of 6 levels (Gutscher and Penty 2012).

On August 8th, Prime Minister Stephen Harper and his cabinet are revealed to be 'wrestling with how to handle the proposed takeover'. The vagueness of the Investment Canada Act is the subject of further comment (Mayeda and Argitis, CNOOC-Nexen bid tests Harper's China policy 2012).

This continues on the 20th of August, with remarks from the Premier of Alberta stating that "these projects (oil sands in Alberta) are going to require substantial investment to be able to move forward, and we're going to require investment dollars from both Canadian companies and companies outside our nation". The Prime Minister adds in an interview that it is a national priority to export natural resources to the growing Asian economies. (Mayeda, Nexen Shows No Confidence Yet in Harper Assent 2012)

August 23rd brings more remarks from the Prime Minister, effectively continuing to mull the decision over. He was responding to a question from a reporter about a poll from Sun News Network that showed the majority of Canadians do not approve of CNOOC acquiring Nexen. (Mayeda, Harper Says Cnooc-Nexen Must Be in Canada's Interest 2012)

On August 29th, reports indicate that "inbound takeovers from China to Canada may be on hold while the Canadian government weighs what to do about CNOOC's bid". The Chinese government has apparently halted any other acquisitions that are potentially in the pipeline for

Canada until this issue is resolved. Additionally, CNOOC makes their formal application for government approval. The government now has 75 days to make a decision. (Balji 2012)

On August 30th, opposition parties are demanding more clarity into how this deal is being analyzed. "We don't have clear rules, we don't have a clear process, we don't have a transparent process. The public has lost confidence… And on the other hand, I think investors really question will this takeover blow up ... or is it subject to clear rules and a thorough review process that everybody can trust", said NDP MP Peter Julian. (Levitz 2012)

On September 6th, the Prime Minister, speaking to a Bloomberg reporter, states that “the Chinese are acutely aware, in my own experience, of the fact the trade and investment flows are disproportionately in their favor. They recognize that has to change. We will also be seeking things from them.” Additionally, he is aware of Canadian sentiments on the issue, adding that China must show it can play by “the same rules” as Canada. (Argitis and Mayeda 2012)

On September 20th, Nexen shareholders vote favorably on the CNOOC takeover bid. “CNOOC, China’s largest offshore oil and gas producer, agreed to pay $27.50 a share for Calgary-based Nexen in an offer announced July 23. The deal still needs approval from the Canadian government, which reviews foreign acquisitions worth more than C$330 million ($337 million) to ensure there’s a “net benefit” to the country. “ (Penty, Nexen Shareholders Approve Cnooc’s $15.1 Billion Takeover Offer 2012)

On October 11th, Ottawa extends the deadline for review by 30 days. “Extensions to the review period are not unusual,” said Industry Minister Christian Paradis. “The proposed transaction is undergoing a rigorous review under the Investment Canada Act…The required time will be taken to conduct a thorough and careful review of this proposed investment." (Mayeda, Canada Extends Cnooc's $15.1 Billion Nexen Review by 30 Days 2012)

On October 19th, the Minister of Industry, Christian Paradis, rejects PETRONAS' proposal to acquire Progress Energy, indicating that it has failed the net benefit test. Progress Energy responds the following day, saying that this deal is crucial (Krugel 2012).

On November 2nd, Nexen's deadline is extended for another 30 days. (Canadian Press 2012)

On December 7th, 2012, the bid passes the Canadian regulators, and Industry Minister Christian Paradis announces that both the Nexen and Progress energy deals have been approved. The Minister reiterates numerous times that these were special circumstances, both in his statements after markets closed and in the following days. The only additional barrier remaining is the American regulators, due to the assets in the Gulf of Mexico. (Isfeld 2012)

On February 2, 2013, the bid finally comes to an end, with the American regulators giving final approval. The Committee on Foreign Investment in the United States (CFIUS) did not elaborate on any restrictions it might have, but Nexen representatives aimed for the deal to finish by February 25th. CNOOC would eventually cede control of Nexen's Gulf of Mexico assets a few weeks later due to national security concerns. (Penty, Cnooc Wins Final Approval for $15.1 Billion Nexen Takeover 2013)

## 3-Literature Review

### 3.1-Event Study Method

Arguably the most important, and most cited, paper in event study analysis is the famous Fama, Fisher, Jensen and Roll (1969) paper, "The adjustment of stock prices to new information." Their analysis uses the market model to examine event impacts, where $R_{i,t}= \beta_i + \beta_i R_{m,t} + u_{i,t}$ where $R_{i,t}$ denotes return for the firm, and $R_{m,t}$ denotes return for the market. The return for the market is critical in this analysis, as it is the primary control variable. The assumption is that it captures general market sentiment, so any other market activity that would have impacted the firm has been accounted for. In their study, they have a structural break, regarding stock split on stock prices, and the residual $u_i$ is an estimator of the abnormal return for stock i during the time period. Thus, by effectively setting up the regression before and the regression after the date, they are able to estimate the impact of the event. The abnormal return reflects the extent to which the market/portfolio/security was impacted by some event, and differs from the expected rate of return.

However, Binder (1985) finds fault with the Fama et al. method, because it assumes that the residuals are independent and identically distributed. Firstly, the abnormal returns predicted will likely differ across firms. Secondly, there is evidence (presented by Fama, 1976, no less), that the residual variance differs across firms. And finally, the residuals are not independent if the event occurs during the same period for firms in related industries. It is thus suggested that researchers use a multivariate regression model, which is similar to the market model used by Fama et al. but with one addition:

$$\check{R}_{i,t}= \beta_i + \beta_i R_{m,t} + \Sigma_{\alpha=1}^{A} \gamma_{i,\alpha} D_{\alpha,t} + \check{u}_{i,t}$$

Here, $\gamma_{i,}$ is where the abnormal returns lies. $D_{\alpha,t}$ is the dummy variable for an event. The analysis can be performed using numerous dummies, or one dummy which is equal to one in every period where there is an event, which yields results in the average abnormal return[5]. In this case, the individual abnormal returns can differ across firms. Thus, the return on an individual security is dependent upon the market return and that of abnormal returns given by events. We can analyze the individual events' impact on the securities with this method. This is the methodology that is used in the current paper.

Corrado (2011) found that the methods used today in event study analysis are largely the same as the methods used by Binder. While most modern studies use market portfolios, papers such as Wan and Wong's analysis of the CNOOC-Unocal attempted takeover examine impacts on selected markets (Wan and Wong 2009). This paper is obviously of specific interest to our analysis; however, the markets they examined were oil and gas exploration firms, and oil refining firms. The events that they used were statements by American politicians, and major financial analysts, which are divided into Pro-CNOOC, Anti-CNOOC and Ambiguous events. The study examined the impact of these events on one- and three-day returns. Wan and Wong found a significant correlation between negative news and negative returns in these selected markets.

Analyst recommendations have been used as a proxy for public information as recently as last year in a paper by Savor. The logic he used is the same as the current paper; "price events associated with new information are more likely to be accompanied by analyst reports" (Savor 2012). By using analyst reports' as a quantitative tool to proxy information regarding stocks,

[5]Average abnormal return was used in the analysis here due to the large number of events.

Savor is able to show price movements across various markets. This is to be expected, because these analyst reports are designed to do exactly that.

Bartholdy, Olson and Peare (2007) determined that, on small stock exchanges, at least 25 events are required for the event study analysis, trade-to-trade returns should be used, and there should not be abnormal performance detection of less than 1% unless the analysis is using thickly traded stocks[6].

## 3.2-Efficient Market Hypothesis

The empirical question raised in this paper is the following: how does the Nexen deal impact Canadian stock prices? As a way of looking at the impact, we must consider the various forms of the efficient markets hypothesis.

There are three theoretical arguments on which the efficient markets hypothesis stand (Copeland, Weston and Shastri 2005):

1) Investors have rational preferences and beliefs in valuing securities. They make trades that maximize expected utility and update their beliefs using Bayesian rules.
2) For those who are not rational, their trades are random, and when there is a large number of such traders, they cancel each other out.
3) If these irrational investors have trading strategies that are not random, and are in fact correlated, they are met with rational arbitrageurs who eliminate their influence on prices.

[6] In our case, this is why the largest 170 companies were chosen.

There are two major empirical predictions of the efficient market hypothesis as a result of this:

1) When news about the value of an asset is revealed to the market, the asset price should react and incorporate the news quickly and correctly. Prices should neither under- nor overreact to the news. There should be neither price trends nor reversals.
2) Prices should not change without news on the asset.

The efficient markets hypothesis is vital to most financial econometric analysis. It is a strong assumption supporting the rationale of the multivariate regression model.

Calvet and Lefoll (1985) performed a merger and acquisition event study analysis on the Toronto stock exchange, with data from 1963 to 1982. They tested to see whether the efficient markets hypothesis holds, and found that it does.  This implies that all information is calculated into the stock's current share price.

On June 4, 2013, Certified General Accountants in Canada (CGA Canada) released a report titled "Empirical Testing of the Momentum Effect in Canadian Capital Markets". They examined the momentum effect, which is the acceleration of a security's price or volume. It is an anomaly of the financial markets that challenges the validity of the efficient markets hypothesis. The analysis used daily adjusted closing prices of 180 cross-listed companies (Canada and the United States) from January 1, 1991 to September 30, 2012. They found that "correlation progresses no further than two weeks of past prices… Hence there is only weak evidence of a short-term momentum effect in Canadian capital markets consistent with the similar findings in international markets" (Gosalia and Lefebvre 2013, p.5).

## 3.3-Mergers and Acquisitions (M&As)

A merger is defined as two or more companies combining their assets to form a single company; only one company officially remains. An acquisition can be differentiated from a merger if the acquired company no longer remains. In the 2005-08 period, when the United States was the target country, it represented 25% of all mergers and acquisitions in the OECD countries, proceeded by the United Kingdom (17%), and then Canada, Germany and Netherlands (all roughly 7%). On acquisitions, the United States led with 19%, followed by the United Kingdom (15%), France (10%) and finally Germany (9%).

According to Halpern (1982), there are two classes of acquisition theories. The first is a "non-value maximizing behavior by the management of acquiring firms". Essentially, firms acquire others in order to grow, they have no net benefit, and one shareholder's gain is the result of another's loss. The firm is empire-building. The second class refers to "value maximization motivations in which the acquisition should meet the same criteria as any other investment decision." This should result in positive economic gain, and the acquiring firm should at least earn a normal rate of return.

Typically, event study analysis papers dealing with mergers and acquisitions take one of two approaches. Some examine a number of mergers and acquisitions on a given variable; for example, Bertrand and Zuniga (2005) examined the impact of cross-border Mergers and Acquisitions (M&As) on research and development. Others examine one variable impacting M&As; for example, Aharon, Gaviou and Yosef (2009) analyzed stock market bubbles and M&As. The CNOOC-Nexen case does not fall clearly into one of these areas, because the shareholder of CNOOC is essentially the Chinese government, and the deal was done primarily for the as-yet unquantifiable gain to the Chinese oil and gas industry as a result of entering

Canada, Great Britain and the Gulf of Mexico. While the examination of Canadian shareholders' change in equity would surely be of interest and warrants further examination, there is almost no literature regarding the impact on the rest of the economy in mergers and acquisitions.

Other than Wan and Wong's (2009) paper, there has been no research on the impact of political opposition of cross-border merger and acquisitions on home stock markets[7]. There are only two differences between the Wan and Wong case and the case analyzed here: first, CNOOC was attempting to purchase Unocal (an American firm, roughly equivalent in size to Nexen for the United States energy firms), and second, the CNOOC bid failed in the Unocal case. The Wan and Wong paper examined the impact on the returns of oil and gas companies that specialized in oil and gas exploration as well as oil refining. Both negative and ambiguous political events regarding CNOOC-Unocal resulted in a negative correlation with returns, whereas positive events resulted in positive returns.

## 4-Methodology

Using news as a proxy variable for the quantity of information that is held by analysts presents an obvious question: which variable should be chosen? Although analyst reports have been used, in this case we adopted a broader approach. Because no recently published work identifies certain variables to be of interest over others, a number of different variables were used independently of each other. Moreover, it is unlikely that financial investors will openly reveal the exact methods they use to price securities, so the analysis undertaken in the current paper also has the fortunate side effect of contributing to academic knowledge of what the market considers important information in pricing options.

[7] There is none on Canadian markets.

Prior to testing, the data was examined for stationarity and for collinearity between variables. While stock market prices do not tend to be stationary, the variables used here are rates of return, which do tend to be. To test for stationarity, the Dickey Fuller test was used. All variables were (surprisingly) stationary[8]. A correlation matrix was made in Stata to check for multicollinearity across the independent variables, and it was dismissed because the correlation never rose above 0.4.

This empirical work aims to examine how the acquisition impacted markets around Canada. This is accomplished by setting the dependent variable to be a sector of the Canadian economy. While this varies from the traditional single-firm approach, it should capture a more macro impact.

To see how the variables interacted, a broad approach was used. Each sector, as the dependent variable, was regressed against an average of the rest of the market (RoM) as well as a news variable. As shown earlier, the RoM variable ($R_{m,t}$) is included as a control variable which should control for all other factors impacting a stock change. Since there was not any literature found describing the optimal usage of this control, the RoM variable is split into 1-, 2-, and 5-day returns (similarly to the dependent variable). Each dependent sector variable was regressed on its 1-, 2-, and 5-day RoM counterpart in successive fashion, followed by news variables. Overall, there were over 800 regressions[9]. As mentioned earlier, the multivariate regression model was used.

[8] Originally, stock prices instead of returns were also included. But this resulted in non-stationary variables, so they were not included in the paper.
[9] For reference, only the 1-day return dependent variables are included in the appendix.

$$\check{R}_{i,t} = \beta_i + \beta_i R_{m,t} + \Sigma_{\alpha=1}^{A} \gamma_{i,\alpha} D_{\alpha,t} + \breve{u}_{i,t}$$

$$\text{Sector}_{i,t} = \beta_0 + \beta_1 \text{RoM}_{i,t} + \gamma\ \text{news}_{i,t}$$

Here $\check{R}_{i,t}$ and $R_{m,t}$ can be set up in 9 different combinations, with each representing a separate regression[10]:

| Dependent Variable (Return on individual market sector) | Independent Variables (RoM +News) |
|---|---|
| $R_{i,1}$ | $R_{m,1}$ + $news_{i,t}$ |
| $R_{i,1}$ | $R_{m,2}$ + $news_{i,t}$ |
| $R_{i,1}$ | $R_{m,3}$ + $news_{i,t}$ |
| $R_{i,2}$ | $R_{m,1}$ + $news_{i,t}$ |
| $R_{i,2}$ | $R_{m,2}$ + $news_{i,t}$ |
| $R_{i,2}$ | $R_{m,5}$ + $news_{i,t}$ |
| … | … |

Many different combinations were used because the literature does not contain convincing evidence suggesting that one combination was preferable to the others. Particularly in light of the results shown Gosalia and Lefebvre's (CGA) paper, with market momentum existing in the TSX, it was felt best to present a number of different approaches to the RoM variable. Ultimately, this is a control variable, and is not the focus of attention for this paper.

The variable of particular interest here is the news variable mentioned above, because it gives the average abnormal return based on the event study method using the multivariate regression model suggested by Binder. The news variable, or new information, actually

[10] The full output and list of regressions are available in the appendix.

comprises a number of different variables. As mentioned above, there exists little information in this area, so a number of different variables are used to try and best approximate new information. Each news outline was regressed individually because the interconnectivity between them was unknown. Chow tests proved inconclusive in adding variables, and to avoid specification error it was thought prudent to avoid mixing and matching news variables. The news variables selected (described in the data section at greater length), were chosen due to their availability on a Bloomberg terminal.

The approach was initially going to code each event as a separate dummy, but too many events were present for proper analysis. A separate dummy variable for each event would allow us to analyze the impact of each individual event, but because each news variable contains well over 15 events, the analysis was rendered infeasible. For the purposes of this paper, determining the average impact of the news variables is more important in establishing some type of baseline in this area of research.

## 5-Data

All the data was taken from a Bloomberg terminal on University of Ottawa campus using the Microsoft Excel plugin. All news articles were also taken from Bloomberg using their news search program. The reasons behind this were twofold: first, the internal search engine was easy to use to find any news related to the takeover bid, and not any news that just happened to have both CNOOC and Nexen mentioned in it (for example an article discussing all companies that operate in a given region); and second, Bloomberg is the market leader in providing market data (larger than Thompson-Reuters, with more than 300,000 subscribers), and can thus be considered a major source of news for investors the world over, so to use its own search engine should be the best product for the news available to the market. The data begins a week before the bid by CNOOC; on Monday July 16th, 2012, and ends a week after the deal concluded on February 9th, 2013. In total it spans 166 days; thus, for each regression n=166.

## 5.1-Traded Securities

The traded securities were the 170 largest companies on the TSX that are Canadian-owned. The 1-day, 2-day and 5-day return for each stock was obtained (avg_#d_sector). The securities were then split into market sectors given by Bloomberg and the average value taken; sectors included communications, consumer goods, energy, financial, health, industrial, materials, technology, and utilities.

A new variable, best described as Rest of Market returns (RoM), was created to capture the market movement related to every sector except the sector being examined. For example, avg_1d_xhealth = average (communications, consumer goods, energy, financial, industrial, materials, technology, and utilities), where health has not been included, in order to capture the market movement of everything other than the health industry[11]. The theory behind this variable is that, rather than trying to capture the exact nature of the other exogenous variables that might impact the given sector, we assume that it has already been accounted for in the rest of the market data. As described above, the Canadian stock market was shown to be semi-strong in the efficient markets hypothesis, so this approach should allow us to examine all the major variables.

[11] A correlation matrix was done for this to ensure multicollinearity would not be a problem; it rarely rose above 0.6 and never above 0.7.

## 5.2-News Stories

We now detail our subjective measures to examine news stories relating to the deal. In terms of information regarding the deal, these news reports/Bloomberg estimates are used as proxy variables for the new information given by the market. It is unclear which variable will actually impact the markets, since some combination of them are likely used by traders, who use programs to automate their trading strategies. The news stories were divided into three broad categories/events, positive, negative and ambiguous, based on the general sentiment of the articles read.

A positive event would be an event that moves the deal in a forward direction, such as the announcement of the deal, the Nexen Shareholders signing off on the deal, or the Government giving final approval.

A negative event would be an event that negatively impacts the deal, such as the opposition party condemning the deal, a financial firm indicating their worries over the deal, or a significant poll indicating negative Canadian support for the deal.

An ambiguous event would be considered news that mentions the deal, but does not directly impact it. There are many instances where a member of the government mentions something similar to “the deal is under close review”, or the fairly common use of extending the deadline for the government to make their decision on whether it may pass or not. This is included because, while it will not necessarily change an investor’s opinion on the stock price evaluation, increasing the amount of news might impact the price of a stock based on the efficient market hypothesis. In other words, if the article was not clearly positive or negative, it was classified as ambiguous.

Major_Positive, Major_Negative, Major_Ambiguous, are dummy variables indicating any major event/story relating to the bid. A major event constitutes an official announcement from CNOOC, Nexen, or the Government of Canada. With this variable, the dummy is entered a day before, and a day after the event is indicated. This spread is designed to allow for news occurring in China and news that occurs at the end of the trading day. The spread is indicated by the inclusion of the suffix, "_3" in the variable name. The major events were included in the timeline above.

All_Positive, All_Negative, All_Ambiguous, are dummy variables indicating all events/stories reported on the Bloomberg wires. This also contains the Major dummy above. This variable also contains the aforementioned spread when the suffix "_3", has been added. There were simply too many events here to have been included in the timeline section above. These dummy variables fill up the entirety of July, most of August and September, lessen in October and November, and slowly decline further until the eventual February completion.

During the acquisition time period, there were no major news or shocks that should have impacted oil and gas companies in Canada besides the acquisition[12]. In fact there was only one day with a large stock price change (Nov 14, 2012); we performed a test for structural break, and it was rejected, so the date was not included in the testing.

[12] With the exception of the Progress Energy deal, which was initiated before the Nexen deal. The Nexen deal was also extended before the Progress energy deal was. These events were recorded in the events, but not seen as structural breaks.

## 5.3-Analyst Ratings

A number of variables are a quantitative measure of the news of Nexen, given by Bloomberg and other professional analysts. These variables are based on the idea that the analysts respond to the news given about Nexen and will accurately report it in their recommendation.

An important assumption must be made about the analysts here. CNOOC gave a 61% premium on the closing stock price of Nexen, so a buy rating would assume that the deal is going through since it began lower than its eventual settlement price.

AMT_REC_RATING is the rating created in-house at Bloomberg; this rating is created using individual analyst ratings and the Bloomberg proprietary algorithm. The rating takes a value between 1 and 5, where a rating of 3 means the market should hold, < 3 means they should sell, and > 3 means they should buy.

Two variables have the prefix 'RELA', which indicates whether the position has changed relative to last recommendation; thus, if the stock moves more towards sell than buy while still holding an overall buy position (e.g., from 3.5 to 3.4), it will appear as a relative sell (RELA_RELATIVESELL). This also represents a simple binary dummy variable.

TOTBUYCHANGE, TOTSELLCHANGE, and TOTHOLDCHANGE, are variables that represent the change in the number of analysts who are issuing a buy, sell or hold respectively. For example, if one analyst moves from hold to buy at time T, we will have -1 for TOTHOLDCHANGE and +1 for TOTBUYCHANGE, with zeroes everywhere else. The number of analysts is not fixed and analysts come and go from the total pool.

Finally, the NEWS_HEAT variables quantify all news articles regarding a company. Unfortunately, the exact statistical methods used for calculating these are proprietary methods used by Bloomberg; we provide their descriptions below, but cannot elaborate[13].

To determine the amount of news read regarding Nexen, the variables used were NEWS_HEAT_READ_DAVG and NEWS_HEAT_READ_DMAX; referring to both the average value NEWS_HEAT_READ and the maximum for each day respectively. The NEWS_HEAT_READ is "a measure of readership interest in a company relative to the previous 30 days, based on the number of times people call up stories with the ticker attached and the number of times they run CN on the ticker looking for news. A score of 0 indicates readership is not widespread or is below the 30-day average. Scores of 1-4 indicate readership is unusually high, with 4 representing the top of the range" (Bloomberg L.P. 2013).

To determine the number of news stories published; the variables used were NEWS_HEAT_PUB_DNUM and NEWS_HEAT_PUB_DMAX, which refer to the total number of stories published and the maximum published respectively. NEWS_HEAT_PUB, is "a measure of the amount of stories currently being published on a company relative to the flow over the previous 45 days. A score of 0 indicates the current flow of stories is not unusually heavy for the security. Scores of 1-4 indicate the story flow is unusually high, with 4 representing the top of the range" (Bloomberg L.P. 2013).

Finally, in order to try and control for the actual takeover events, a variable appropriately named takeoverevent was used. This was a dummy variable indicating an event that was a significant event on the takeover cycle. For example, if there was a vote by Nexen or CNOOC

[13] Bloomberg specialists were contacted by phone and would not elaborate beyond what is written here.

shareholders to move forward, or the origin/completion of the deal, it would be indicated through this dummy variable.

## 6-Results

To summarize the dependent 2- and 5-day return results is straightforward: they initially showed positive autocorrelation after performing the Durbin-Watson test, and could not be corrected for regardless of method. Every variation of a test using Stata (and a few using SAS) was attempted to no avail; correcting for autocorrelation never yielded a Durbin-Watson statistic even close to acceptable. Adding in "takeover event" as an additional dummy did not yield a significant result, nor did it affect the sign of any variable, so it was dropped from the final analysis. This autocorrelation is likely due to the overlapping nature of the days analyzed.

The 1-day return also carried positive autocorrelation, but this was remedied by using a Prais-Winston transformation[14]. The RoM variable was significant in 170 out of 190 cases, and held a positive relation in all cases.

To summarize, the variable of interest is the news variable. As mentioned above, the various sectors of the Canadian economy should not all react to the news, because some parts are largely removed from market influence. This section is broken down into two groups, backbone and auxiliary.

Because Canadians believe energy, financials, technology, and materials are the most important sectors of the economy, they will be considered the backbone sectors, as mentioned earlier in the polling by Harris-Decima. These sectors are also largely impacted by the markets at

[14] Specifically, in Stata the option 'Adjusted Durbin-Watson' was selected, under 'Method to compute autocorrelation'. No other options were selected for the regressions, although every option was evaluated. It was then exported to excel using the estout command.

home and abroad. These sectors are the most visible, and these companies make up a large percentage of the most active on the TSX, as well as having higher value.

Auxiliary sectors are those that are largely not subject to international markets, and are reasonably insulated against other market movements, foreign or domestic. This will include Communications, health, consumer discretionary, industrials and utilities. The communications and health industries are very well shielded from outside influence due to regulation. Consumer discretionary, industrials and utilities are less so, but are more shielded than the backbone sectors. It is not expected that these sectors will be largely impacted by this deal.

The tables in the following section show significant results only (above t-stat of 1.645, or 10% level of significance). The first column indicates how many days' return the RoM variable was over, followed by its coefficient and then t-statistic. The next column shows the news variable that is significant. The dependent variable is 1-day return of the sector in question, and the independent variables can be read across the row. The RoM variable was not included for the auxiliary sectors in order to save space, and because it is not necessarily of interest in our analysis, but can be seen in the appendix[15]. The r-squared was also included for each regression.

[15] A full output of all regressions preformed on the 1 day dependent return is available in the appendix

## 6.1-Backbone Sectors

### 6.1.1-Energy

**Energy**

| Return | RoM | T-Stat | amt_rec_rating | T-Stat | $R^2$ |
|---|---|---|---|---|---|
| 1 Day | 1.585 | (9.13) | 0.0337 | 2.3 | 0.335 |
| 2 Day | 0.140 | (4.89) | 0.0265 | 1.62 | 0.112 |

The energy variable is one of the most telling with respect to the efficacy of the model. Nothing was expected to have a strong impact on the market in this sector, because the sector is largely dominated by international demand and supply movements. There were only two positive significant results in amt_rec_rating. If we consider the immense size of the oil and gas industry worldwide, and the fact that most impacts on stock prices are due to demand and supply of worldwide markets, the Nexen deal is just a drop in a barrel of crude, mounted on a ship. Furthermore, Chinese expansion is no surprise; news of China purchasing more oil and gas assets should not have a strong impact on world markets. Moreover, any actions CNOOC makes (investment in pipelines, etc) will not be able to occur until well after the deal is completed, if at all. A sizeable investment in Nexen will also likely leave CNOOC with considerably less cash to invest in projects like this. There is no immediate, or even long-term, risk of China ‘stealing’ all of the Canadian and British oil and gas as a result of this deal. The only real change in the foreseeable future will be the title of who has the right to extract oil and gas from the ground.

However, an increase in the rating could raise other stock prices in the sector due to the increased investment that China will bring. An increase in the rating results in an average abnormal return of approximately 0.03. While not a large amount, it is expected theoretically.

As the focus of the debate, listening only to pundits and politicians and ignoring fundamental economics would lead us to expect significant change in this variable. While the positive result is not that large, the less obvious observation is that there is no negative result. So even if one questions the positive impact to this, we cannot claim that there is evidence of net loss. For policy makers, this observation is as important as finding a positive result.

### 6.1.2-Financials

**Financial**

| Return | RoM | T-Stat | rela_relativebuy | T-Stat | rela_relativesell | T-Stat | | | $R^2$ |
|---|---|---|---|---|---|---|---|---|---|
| 1 Day | 0.00476 | (0.29) | 0.00307 | (0.48) | -0.0111* | (-2.07) | | | -0.016 |
| 2 Day | 0.154** | (2.81) | 0.00264 | (0.34) | -0.0147* | (-2.21) | | | 0.039 |
| 5 Day | 0.730** | (2.84) | 0.00229 | (0.26) | -0.0160* | (-2.15) | | | 0.038 |
| | | | | | | | | | |
| Return | RoM | T-Stat | totbuychange | T-Stat | totholdchange | T-Stat | totsellchange | T-Stat | $R^2$ |
| 1 Day | 0.186 | (1.80) | 0.00512* | (2.01) | 0.00485 | (1.43) | 0.000352 | (0.06) | 0.010 |
| 2 Day | 0.0286 | (1.88) | 0.00496 | (1.60) | 0.00781 | (1.89) | -0.000606 | (-0.08) | 0.001 |
| 5 Day | 0.0386** | (2.80) | 0.00726* | (2.07) | 0.00717 | (1.53) | 0.00119 | (0.14) | 0.055 |

Financials showed a negative return across all return dates when the rating was a relative sell, as well as positive when more analysts thought it was a buy or hold. So, in brief, the financial industry reacts well to positive ratings and negatively to negative ratings, implying that progression towards a deal was good for markets. Each time the analysts doubted that the deal would go through and issued a sell, the financial services sector had an average abnormal return of approximately -0.01. If the analysts believed it would rise, it would result in an average abnormal return of just over 0.05.

It makes sense that the financial markets respond to analyst changes. The financial markets would see a marked increase in investment in Canada if the deal passed through. China would certainly boost capacity and revenues in the industry, creating more local jobs and more taxable revenue to the province and country.

### 6.1.3-Technology

**Technology**

| Return | RoM | T-Stat | all_ambiguous_3 | T-Stat | all_negative_3 | T-Stat | all_positive_3 | T-Stat | $R^2$ |
|---|---|---|---|---|---|---|---|---|---|
| 1 Day | 0.602 | (4.62) | -0.000238 | (-0.21) | 0.000700 | (0.41) | -0.00251* | (-2.04) | 0.109 |
| 2 Day | 0.0690 | (3.45) | -0.000265 | (-0.23) | 0.000779 | (0.44) | -0.00236 | (-1.86) | 0.061 |
| 5 Day | 0.0799 | (4.55) | -0.0000330 | (-0.03) | 0.000181 | (0.10) | -0.00243 | (-1.77) | 0.127 |

The technology sector was only negatively impacted by the all_positive_3 variable, across all three return days. It showed a fairly consistent -0.002 decrease in average abnormal returns; while not a very large result, this represents a not-insignificant amount of movement for an entire market. Similar to the results in the energy sector, we cannot say that the eventual end of the deal resulted in a net benefit. We might say the loss was not substantial, but there is no evidence to show that there was a net benefit.

Although Canada is a relatively large economy, it does not share the same large scale investment as the United States, as evidenced by the lack of a Canadian acquisition of Nexen, Blackberry, Potash Corp., etc., there is only so much capital to go around. The technology sector could view this as energy getting all of the potential capital attention of investors.

As mentioned earlier, the bid for Blackberry by Lenovo (amongst others) was halted due to national security concerns. The CNOOC bid sparks concerns of industrial espionage which would clearly negatively impact Canadian firms. After energy, the next popular area of Chinese investment is technology.

### 6.1.4-Summary of Backbone sectors

Overall, we have three separate responses for the three backbone sectors. This is quite interesting because it creates a complicated answer to the net benefit question. The analysis ended up yielding positive average abnormal return of the financial and energy sectors, but yielded negative average abnormal returns for the technology sector.

Given that the energy and financial sectors are greater than the technology sectors, we are tempted to say that overall this represents a net benefit for the backbone sectors. However, this is based on this initial analysis with relatively low t-statistics and adjusted r-squares. For the purposes of this initial paper, this will be considered a positive net benefit for the backbone sectors as a whole.

## 6.2-Auxillary Sectors[16]

### 6.2.1 –Communications

**Communications**

| Return | totbuychange | T-Stat | totholdchange | T-Stat | totsellchange | T-Stat | $R^2$ |
|---|---|---|---|---|---|---|---|
| 2 Day | -0.000838 | (-0.82) | 0.00235 | (1.73) | -0.00216 | (-0.85) | 0.058 |
| 5 Day | -0.000539 | (-0.53) | 0.00238 | (1.73) | -0.00180 | (-0.70) | 0.117 |
| | | | | | | | |
| Return | amt_rec_rating | T-Stat | | | | | $R^2$ |
| 1 Day | -0.00417 | (-1.96) | | | | | -0.007 |
| 2 Day | -0.00422 | (-1.95) | | | | | 0.015 |
| 5 Day | -0.00384 | (-1.72) | | | | | 0.025 |

The communications sector was significantly impacted by two variables, amt_rec_rating and totholdchange. It held a negative relationship with the analyst rating across 1-, 2-, and 5-day returns, and a positive with the hold ratings.

The communications industry in Canada is dominated by only a few firms, and they have a well-known oligopoly over consumers, resulting in high prices. Thus, if analysts view this stock as a buy (i.e., they believe that the deal will go through), communications investors may be concerned about an increased likelihood that Canada will allow international communications companies (Verizon, Vodaphone, AT&T, etc.) to operate in Canada. As stated earlier, due to the

[16] Only the key explanatory variables have been included here to save space. The RoM variable was not included in the tables, but is available in the appendix.

ambiguity of the Investment Canada Act, as well as the size and nature of this deal, its passing could lead the way for more cross-border acquisitions, or specifically entry into Canada.

### 6.2.2-Health

**Health**

| Return | all_ambiguous_3 | T-Stat | all_negative_3 | T-Stat | all_positive_3 | T-Stat | $R^2$ |
|---|---|---|---|---|---|---|---|
| 1 Day | 0.00201 | (1.77) | -0.000478 | (-0.27) | 0.000712 | (0.57) | 0.325 |
| 2 Day | 0.00204 | (1.74) | -0.000592 | (-0.32) | 0.000700 | (0.54) | 0.117 |
| 5 Day | 0.00227 | (1.89) | -0.00108 | (-0.59) | 0.000507 | (0.38) | 0.168 |
| | | | | | | | |
| Return | news_heat _pub_dmax | T-Stat | news_heat_pub_dnumstories | T-Stat | news_read_dmax | T-Stat | $R^2$ |
| 1 Day | -0.00160 | (-2.81) | 0.00000691 | (2.14) | 0.000491 | (1.16) | 0.104 |
| 2 Day | -0.00155 | (-2.65) | 0.00000637 | (1.93) | 0.000566 | (1.31) | 0.063 |
| 5 Day | -0.00136 | (-2.29) | 0.00000544 | (1.62) | 0.000607 | (1.37) | 0.122 |
| | | | | | | | |
| Return | amt_rec_rating | T-Stat | | | | | $R^2$ |
| 1 Day | -0.00358 | (-2.02) | | | | | 0.047 |
| 2 Day | -0.00369 | (-2.02) | | | | | -0.01 |
| 5 Day | -0.00339 | (-1.82) | | | | | 0.030 |

The health sector has contradictory results. It was impacted both positively and negatively with increasing levels of published stories, which can be seen by the first two news_heat variables. While they are separate variables, one should expect they would move in the same direction, as they do in every other case.  If we look at the value of the average abnormal return, it is very small for the number of stories. It is curious as to how ambiguous news positively impacted the health market, as well as how there is a negative relationship with the rating of Nexen. There was no information that theoretically impacted the health market, so by the efficient market hypothesis there should not be any movement in the stock price. However, this question should be further explored in future research.

### 6.2.3-Industrials

**Industrials**

| | all_ambiguous_3 | T-Stat | all_negative_3 | T-Stat | all_positive_3 | T-Stat | $R^2$ |
|---|---|---|---|---|---|---|---|
| 1 Day | -0.00324 | (-1.82) | -0.0000713 | (-0.03) | -0.00174 | (-0.88) | 0.093 |
| 2 Day | -0.00319 | (-1.68) | 0.000132 | (0.04) | -0.00142 | (-0.68) | 0.431 |

The industrial sector was negatively impacted by 1- and 2-day returns and all_ambiguous_3. However, the average abnormal return is quite small, averaging around -0.0032, meaning that there was minimal impact. Similarly to the health sector, these results are likely due to the fact that there is no linkage between the sectors; again, however, this finding should be further explored in future research.

## 6.2.4-Consumer Discretionary

**Consumer**

| Return | all_ambiguous_3 | T-Stat | all_negative_3 | T-Stat | all_positive_3 | T-Stat | $R^2$ |
|---|---|---|---|---|---|---|---|
| 1 Day | 0.00642 | (2.04) | -0.00372 | (-0.77) | -0.00132 | (-0.38) | 0.008 |
| 2 Day | 0.00606 | (1.68) | -0.00434 | (-0.78) | -0.00147 | (-0.37) | 0.003 |
| 5 Day | 0.00726 | (1.78) | -0.00730 | (-1.18) | -0.00141 | (-0.31) | 0.028 |
| | | | | | | | |
| Return | major_ambiguous_3 | T-Stat | major_negative_3 | T-Stat | major_positive_3 | T-Stat | $R^2$ |
| 5 Day | 0.0111 | (1.21) | -0.0256 | (-1.68) | -0.00643 | (-1.09) | 0.422 |
| | | | | | | | |
| Return | n_pub_dmax | T-Stat | n_pub_dnumstories | T-Stat | n_read_dmax | T-Stat | $R^2$ |
| 1 Day | 0.00125 | (0.85) | -0.0000147 | (-1.73) | 0.0000542 | (0.05) | 0.325 |
| 2 Day | 0.00156 | (0.89) | -0.0000182 | (-1.82) | 0.000837 | (0.63) | 0.133 |
| 5 Day | 0.00272 | (1.46) | -0.0000246 | (-2.26) | 0.00128 | (0.87) | 0.183 |

The consumer discretionary sector held positive significant results for all_ambiguous_3, negative for all_negative_3, and news_heat_pub_dnumstories. The average abnormal return is almost non-existent for number of stories.  There appears to be an overall decrease in average abnormal return, due to the major_negative_3 variable having a larger negative value. However, this variable is quite close to insignificant, so it is likely just an anomaly. Overall, one would not expect consumer discretionary to be significantly impacted, because there is no strong theory relating the buyout to consumer discretionary products.

### 6.2.5-Utilities

**Utilities**

| Return | all_ambiguous | T-Stat | all_negative | T-Stat | all_positive | T-Stat | $R^2$ |
|---|---|---|---|---|---|---|---|
| 1 Day | 0.00117 | (0.89) | -0.000140 | (-0.06) | -0.00269 | (-1.65) | 0.328 |
| | | | | | | | |
| Return | all_ambiguous_3 | T-Stat | all_negative_3 | T-Stat | all_positive_3 | T-Stat | $R^2$ |
| 1 Day | 0.000304 | (0.30) | -0.000544 | (-0.35) | -0.00262 | (-2.37) | 0.032 |
| 2 Day | 0.000126 | (0.13) | -0.000201 | (-0.13) | -0.00248 | (-2.24) | 0.158 |
| 5 Day | 0.000386 | (0.35) | -0.00116 | (-0.68) | -0.00243 | (-1.96) | 0.319 |
| | | | | | | | |
| Return | major_ambiguous_3 | T-Stat | major_negative_3 | T-Stat | major_positive_3 | T-Stat | $R^2$ |
| 1 Day | -0.00455 | (-1.99) | -0.00243 | (-0.63) | -0.00293 | (-1.92) | 0.244 |
| 2 Day | -0.00368 | (-1.62) | -0.00406 | (-1.04) | -0.00285 | (-1.86) | 0.033 |
| 5 Day | -0.00260 | (-1.04) | -0.00564 | (-1.32) | -0.00368 | (-2.21) | 0.128 |
| | | | | | | | |
| Return | n_pub_dmax | T-Stat | n_pub_d#stories | T-Stat | n_read_dmax | T-Stat | $R^2$ |
| 1 Day | 0.000415 | (0.82) | -0.00000255 | (-0.89) | 0.000882 | (2.34) | 0.007 |
| 2 Day | 0.000353 | (0.69) | -0.00000281 | (-0.98) | 0.000984 | (2.63) | 0.019 |
| 5 Day | 0.000734 | (1.37) | -0.00000490 | (-1.62) | 0.00112 | (2.80) | 0.036 |
| | | | | | | | |
| Return | totbuychange | T-Stat | totholdchange | T-Stat | totsellchange | T-Stat | $R^2$ |
| 1 Day | 0.00161 | (1.94) | 0.000613 | (0.54) | 0.00385 | (1.71) | 0.029 |
| 2 Day | 0.00163 | (1.93) | 0.00105 | (0.90) | 0.00366 | (1.58) | 0.009 |
| 5 Day | 0.00194 | (2.18) | 0.000945 | (0.77) | 0.00365 | (1.50) | 0.042 |

The utilities sector was significantly impacted in numerous areas. It was negatively impacted by all three time spreads for all_positive, and major_positive_3. It was negatively impacted by two of the days for major_ambigious_3. It was positively related by totbuychange for all three days.

While the utilities should have been negatively impacted by news of the deal going through, with Canada potentially having less oil and gas in the future due to reserves being shipped to China, it could also have been increased due to the increased investment in pipelines and oil and gas infrastructure that CNOOC can provide and that Nexen could not. Increased infrastructure should also decrease overall cost for this sector.

### 6.2.6-Materials

**Materials**

| Return | all_ambiguous | T-Stat | all_negative | T-Stat | all_positive | T-Stat | $R^2$ |
|---|---|---|---|---|---|---|---|
| 2 Day | -0.0162 | (-2.05) | 0.00619 | (0.43) | -0.00233 | (-0.24) | 0.045 |
| 5 Day | -0.0149 | (-1.75) | 0.00135 | (0.09) | -0.00214 | (-0.21) | 0.023 |
| | | | | | | | |
| Return | major_ambiguous_3 | T-Stat | major_negative_3 | T-Stat | major_positive_3 | T-Stat | $R^2$ |
| 1 Day | 0.0129 | (0.99) | 0.00107 | (0.05) | 0.0145 | (1.72) | 0.012 |
| | | | | | | | |
| Return | n_pub_dmax | T-Stat | n_pub_d#stories | T-Stat | n_read_dmax | T-Stat | $R^2$ |
| 5 Day | 0.00574 | (1.71) | -0.00000280 | (-0.14) | 0.000176 | (0.07) | 0.246 |

The materials sector was negatively impacted by all_ambigious on the 2- and 5-day returns, and positively impacted by the 1 day return of major_positive_3. The number of published news positively impacted the news on the 5-day return.  Again, similar to the health sector, this contradictory result is expected since the sectors do not have any theoretical connection.

### 6.2.7-Summary of Auxiliary Sectors

Overall, with the exception of the utilities sector, the average abnormal return seems to be very low, indicating that none of these sectors are strongly impacted. This result was largely expected, as hypothesized above; none of these sectors are strongly impacted by foreign markets. The notable exception was the utilities sector, which was more impacted than previously thought, and was a legitimate surprise in the analysis.

Returning to the impact to Canadian markets, it is obvious that this deal did not have a large impact on these sectors. This finding is expected, because these sectors are not heavily related to the oil and gas industry. It is difficult to say definitively whether or not this outcome constitutes a net benefit, because it straddles the required significance levels, and these sectors have not been weighted. As a first pass, however, it seems that there is no real impact for the auxiliary sectors on average. If we also consider the lack of significance across all the other variables not included here in this analysis, as well as in the rest of the regressions, we can state with some certainty that these auxiliary sectors were not impacted by this deal, neither in a direct sense, nor due to the ambiguity of the Investment Canada Act.

## 7-Conclusion

The present paper aimed to fill a hole in the literature regarding cross-border acquisitions and their impact on the Canadian market. While this constitutes a very special case, dealing with an acquiring firm that is an SOE, we have shown that the net benefit to Canadian markets may be ambiguous, but it is certainly not negative. We have demonstrated different effects on different market sectors, depending on their exposure to worldwide markets. There was a positive average abnormal return of the financial and energy sectors, and negative average abnormal returns for the technology sector.

This paper is a first pass at a topic that has yet to be fully explored in the literature, and the findings highlight several important points. First, there does appear to be a net benefit to the backbone sectors, while the auxiliary sectors are minimally impacted. As stated above, this is based on an unweighted average; however, we have provided a solid foundation for future research. An important future question relates to how we can use these findings in the future. We are now able to discount many variables as irrelevant to the takeover event study analysis in Canada, and future analyses can focus on the variables identified here.

The linkages between the backbone sectors and auxiliary sectors remain unknown, and the impact of this deal on backbone sectors could have ripple effects in the auxiliary sectors. This question merits follow-up research.

We note that we were unable to correct the 2- and 5-day return dependent variables. However, we postulate that any correction is unlikely to result in statistically significant findings, because even prior to the correction of positive autocorrelation there were few variables of statistical significance. Because a very common symptom of autocorrelation is decreased t-scores, the likelihood of achieving significant results with already low t-statistics is low.

One of our aims was to be able to use individual dummies to analyze the abnormal return of each event, instead of the average. Unfortunately, the number of events and variables renders the analysis infeasible. Clearly, narrowing down the variables is key to accomplishing this.

Another serious follow-up question relates to the reasons for the failure of the event study analysis when examining the variable ‘takeover event’.

Overall this paper constitutes a first step towards establishing further literature in this previously understudied area. As China becomes a larger force in acquisitions worldwide, future acquisitions of this nature seem likely. It is imperative that this analysis be continued and elaborated upon so that policy makers can adjust the Investment Canada Act and ensure that there is a clear net benefit to Canada. Interestingly, there is no mention of the Canadian marketplace within the act; it is hoped that the analysis provided here will begin the movement towards policy action.

## Appendix

### A-Comments By Politicians

Conservative MP Rob Anders in an interview in September 2012; "For Canadian hard assets I am concerned about any acquisition by a foreign state… I have even greater concerns when it comes to China" (Fekete, Financial Post 2012). In referencing the concern of Chinese spying and hampering future growth, Anders was quoted, "There is also the issue of intellectual property. Alberta has a somewhat difficult resource basin that has inspired innovations we should market abroad rather than sell to China" (Fekete, Financial Post 2012). As a member of the leading party, and in the traditionally Conservative province of Alberta, going against party leadership's byline of 'we are reviewing the deal', surely raised a few eyebrows in the media.

The House leader for the NDP, Nathan Cullen, stated that the deal would "be very harmful to the Canadian economy and we have a government that seems to say that 'well, laissez-faire is going to take care of this one.' Well, that's clearly not the case… if Mr. Harper wants to allow other countries to nationalize our industry, then he should have that conversation with Canadians" (Fekete, Financial Post 2012).

"This transaction will be scrutinized very closely," Industry Minister Christian Paradis said Monday in question period, after the NDP demanded a public review of the takeover. "Unlike the other side of the House (of Commons), it is not the intention of the government to put the oil industry out of business." (Fekete, Financial Post 2012)

"If Nexen is to be purchased, then what's next? Is it Talisman, is it Cenovus, is it Encana? Where do these dominoes begin to fall and where do they stop?... They have been absolutely negligent in not engaging Canadians on this file and having the rules set by now …

This decision will set the template for a lot more transactions." Liberal deputy leader Ralph Goodale said.

Peter Julian, NDP-Burnaby-New Westminster: "I have grave concerns about the proposed CNOOC takeover of Nexen. CNOOC is a state-owned entity. While CNOOC has promised to comply with federal and provincial health, safety and environmental laws, this commitment does not address the fact that the executives directing the Canadian subsidiaries' actions reside in China, well beyond the reach of Canadian courts. The CNOOPEC case shows that Chinese state-owned entities will fight all the way to the Supreme Court of Canada to avoid prosecution. Selling our non-renewable natural resources to the highest bidder is not the answer to the issues before us. Please note, I'm not asking you to say no to a foreign investment in the oil sands, but rather to say no to a foreign takeover of the oil sands. Once these resources are sold to a state-owned entity, Canada will never get them back." (Julian 2012)

Conservative MP Brent Rathgeber noted after a caucus meeting; "I share some of my caucus colleagues concerns with respect to the Chinese government's record on human rights" (Curry, Bill 2012). These sentiments were also repeated by above mentioned MP Rob Anders.

Independent MP Peter Goldring moved for full review of the case by a special committee, and create this committee for future use of all incoming takeover bids. "The special committee (is to) present its final report to the House of Commons within 10 months after the adoption of this motion with answers to the following questions, (i) are such takeovers conducted on an equitable basis keeping in mind human rights, citizen rights, worker's rights, and environmental practices, (ii) is due diligence being done on foreign state-owned enterprises, both the corporation as well as their home country, who are looking to takeover a Canadian owned company, (iii) what will the long term effects be for Canada and Canadians with regards to the industry in question, (iv) what are the options available to Parliament in the exercise of its legislative authority in accordance with the Constitution and decisions of the Supreme Court of Canada to affirm, amend, or replace existing legislation regarding foreign state-owned enterprises taking over Canadians companies or corporation". The independent MP's motion did not pass. (O'Malley 2012)

## B-Variable List

| Name | Definition |
|---|---|
| 1(Sector), 2(Sector), 5(Sector) | The number refers to the amount of days the return was over, and the sector refers to an individual sector of the economy. 1Health refers to 1 day return of the health sector. 5Financial refers to 5 day return of the financial sector. |
| Rest of Market (RoM) | Rest of Market returns (RoM), was created to capture the market movement related to every sector except (x) the sector being examined. For example, the health sector: = average (communications, consumer goods, energy, financial, industrial, materials, technology, and utilities) |
| Major_Positive<br>Major_Negative<br>Major_Ambiguous | Using the news articles from Bloomberg, a value of 0 or 1 was given to each of the three variables. A major event must be a news article which is an event that will directly impact the bid (shareholder vote, government extension/approval, etc), or it contains speech/text from a person of significant power whom is alluding to the outcome (Stephen Harper says it will pass, House Democrats will try and block, etc). The suffix "_3" means that the dummy variable is also assigned a day before and a day after the event. |
| All_Positive<br>All_Negative<br>All_Ambiguous | Same as above, but instead of only major events, this variable contains an anaylsis of every news story available on the Bloomberg news application. The suffix "_3" means that the dummy variable is also assigned a day before and a day after the event. |
| amt_rec_rating | Based on Bloomberg analyst rating, which itself is a properitary algorithm, but ranges from 1-5 (includes decimals). If security is a 3 it means analysts believe the stock is a hold, less than 3 it is a sell, greater than 3 is a buy. |
| totbuychange<br>totholdchange<br>totsellchange | Each one of these variables represents a change of the number of analysts to the analyst recommendation of buy, hold or sell. |
| rela_relativebuy<br>rela_relativesell | These two dummy variables represent a change in the Bloomberg rating towards either a buy or sell. For example, if the rating changes from 3 to 3.8, rela_relativebuy will be equal to 1. If there is no change, it remains zero. |
| news_heat_pub_dmax<br>news_heat_pub_dnumstories<br>news_heat_read_dmax | These variables represent Bloomberg proprietary values which indicate the number of published stories max for the day, the number of stories for the day, and the max number of stories read by the reader for the day. The data is collected from Bloomberg terminal usage to see what their users are reading, and if the readership is above what would be considered normal it is given a value between 1-4, zero otherwise. |

## C-Regressions

| RoM Sector and Period | RoM | T-Stat | | Coef. | T-Stat | | Coef. | T-Stat | | Coef. | T-Stat | $R^2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1comm | 0.139*** | (4.45) | all_ambiguous | 0.000175 | (0.12) | all_negative | -0.000808 | (-0.30) | all_positive | 0.00273 | (1.52) | 0.103 |
| 2comm | 0.939*** | (11.11) | all_ambiguous | -0.000452 | (-0.28) | all_negative | -0.00129 | (-0.46) | all_positive | 0.00280 | (1.48) | 0.422 |
| 5comm | 3.910*** | (11.21) | all_ambiguous | -0.000328 | (-0.20) | all_negative | -0.00140 | (-0.49) | all_positive | 0.00281 | (1.47) | 0.428 |
| 1comm | 1.175*** | (12.67) | all_ambiguous_3 | 0.00119 | (0.93) | all_negative_3 | 0.000190 | (0.10) | all_positive_3 | -0.00102 | (-0.71) | 0.493 |
| 2comm | 0.101** | (3.24) | all_ambiguous_3 | 0.00138 | (1.05) | all_negative_3 | -0.000183 | (-0.09) | all_positive_3 | -0.00103 | (-0.70) | 0.046 |
| 5comm | 0.338*** | (7.53) | all_ambiguous_3 | 0.00170 | (1.26) | all_negative_3 | -0.000730 | (-0.35) | all_positive_3 | -0.00133 | (-0.88) | 0.246 |
| 1comm | 1.576*** | (9.08) | major_ambiguous_3 | -0.00155 | (-0.52) | major_negative_3 | -0.000911 | (-0.19) | major_positive_3 | -0.00144 | (-0.77) | 0.333 |
| 2comm | 0.139*** | (4.86) | major_ambiguous_3 | -0.000701 | (-0.23) | major_negative_3 | -0.00244 | (-0.49) | major_positive_3 | -0.00186 | (-0.97) | 0.113 |
| 5comm | 0.163*** | (5.90) | major_ambiguous_3 | -0.000401 | (-0.13) | major_negative_3 | -0.00263 | (-0.52) | major_positive_3 | -0.00197 | (-1.00) | 0.173 |
| 1comm | 0.0408 | (1.82) | rela_relativebuy | 0.00107 | (0.44) | rela_relativesell | 0.00140 | (0.67) | | | | 0.012 |
| 2comm | 0.385*** | (5.69) | rela_relativebuy | 0.00108 | (0.42) | rela_relativesell | 0.000688 | (0.31) | | | | 0.149 |
| 5comm | 2.376*** | (8.75) | rela_relativebuy | 0.00103 | (0.40) | rela_relativesell | 0.000480 | (0.22) | | | | 0.310 |
| 1comm | 0.584*** | (7.28) | n_pub_dmax | 0.0000883 | (0.15) | n_pub_d#stories | -0.00000172 | (-0.49) | n_read_dmax | -0.000231 | (-0.48) | 0.236 |
| 2comm | 0.0360 | (1.79) | n_pub_dmax | 0.000208 | (0.33) | n_pub_d#stories | -0.00000294 | (-0.81) | n_read_dmax | -0.0000937 | (-0.19) | 0.003 |
| 5comm | 0.162*** | (4.86) | n_pub_dmax | 0.000352 | (0.56) | n_pub_d#stories | -0.00000341 | (-0.93) | n_read_dmax | -0.0000723 | (-0.15) | 0.112 |
| 1comm | 0.629*** | (4.86) | totbuychange | -0.00100 | (-1.03) | totholdchange | 0.00200 | (1.53) | totsellchange | -0.00218 | (-0.91) | 0.120 |
| 2comm | 0.0710*** | (3.59) | totbuychange | -0.000838 | (-0.82) | totholdchange | 0.00235 | (1.73) | totsellchange | -0.00216 | (-0.85) | 0.058 |
| 5comm | 0.0825*** | (4.68) | totbuychange | -0.000539 | (-0.53) | totholdchange | 0.00238 | (1.73) | totsellchange | -0.00180 | (-0.70) | 0.117 |
| 1comm | 0.00446 | (0.27) | amt_rec_rating | -0.00417 | (-1.96) | | | | | | | -0.007 |
| 2comm | 0.137* | (2.45) | amt_rec_rating | -0.00422 | (-1.95) | | | | | | | 0.015 |
| 5comm | 0.691** | (2.70) | amt_rec_rating | -0.00384 | (-1.72) | | | | | | | 0.025 |
| 1cons | 0.185** | (2.65) | all_ambiguous | -0.00232 | (-0.62) | all_negative | 0.000181 | (0.03) | all_positive | -0.000869 | (-0.20) | 0.030 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2cons | 0.00445 | (0.31) | all_ambiguous | -0.00555 | (-1.25) | all_negative | -0.00329 | (-0.41) | all_positive | 0.000581 | (0.11) | -0.016 |
| 5cons | 0.0745** | (2.79) | all_ambiguous | -0.00573 | (-1.18) | all_negative | -0.00538 | (-0.62) | all_positive | 0.000937 | (0.16) | 0.027 |
| 1cons | 0.165 | (1.59) | all_ambiguous_3 | 0.00642* | (2.04) | all_negative_3 | -0.00372 | (-0.77) | all_positive_3 | -0.00132 | (-0.38) | 0.008 |
| 2cons | 0.0274 | (1.79) | all_ambiguous_3 | 0.00606 | (1.68) | all_negative_3 | -0.00434 | (-0.78) | all_positive_3 | -0.00147 | (-0.37) | 0.003 |
| 5cons | 0.0324* | (2.39) | all_ambiguous_3 | 0.00726 | (1.78) | all_negative_3 | -0.00730 | (-1.18) | all_positive_3 | -0.00141 | (-0.31) | 0.028 |
| 1cons | 0.138*** | (4.37) | major_ambiguous_3 | 0.00286 | (0.39) | major_negative_3 | -0.0108 | (-0.90) | major_positive_3 | -0.00275 | (-0.59) | 0.097 |
| 2cons | 0.926*** | (11.07) | major_ambiguous_3 | 0.00711 | (0.87) | major_negative_3 | -0.0202 | (-1.49) | major_positive_3 | -0.00354 | (-0.67) | 0.436 |
| 5cons | 3.888*** | (11.05) | major_ambiguous_3 | 0.0111 | (1.21) | major_negative_3 | -0.0256 | (-1.68) | major_positive_3 | -0.00643 | (-1.09) | 0.422 |
| 1cons | 1.179*** | (12.60) | rela_relativebuy | 0.00440 | (0.74) | rela_relativesell | 0.00153 | (0.30) | | | | 0.488 |
| 2cons | 0.0946** | (3.02) | rela_relativebuy | 0.00500 | (0.70) | rela_relativesell | -0.00217 | (-0.35) | | | | 0.055 |
| 5cons | 0.345*** | (7.75) | rela_relativebuy | 0.00479 | (0.62) | rela_relativesell | -0.00373 | (-0.56) | | | | 0.265 |
| 1cons | 1.586*** | (9.04) | n_pub_dmax | 0.00125 | (0.85) | n_pub_d#stories | -0.0000147 | (-1.73) | n_read_dmax | 0.0000542 | (0.05) | 0.325 |
| 2cons | 0.139*** | (4.92) | n_pub_dmax | 0.00156 | (0.89) | n_pub_d#stories | -0.0000182 | (-1.82) | n_read_dmax | 0.000837 | (0.63) | 0.133 |
| 5cons | 0.158*** | (5.72) | n_pub_dmax | 0.00272 | (1.46) | n_pub_d#stories | -0.0000246* | (-2.26) | n_read_dmax | 0.00128 | (0.87) | 0.183 |
| 1cons | 0.0364 | (1.61) | totbuychange | -0.000113 | (-0.05) | totholdchange | 0.00138 | (0.43) | totsellchange | -0.00163 | (-0.28) | 0.006 |
| 2cons | 0.362*** | (5.32) | totbuychange | 0.000925 | (0.32) | totholdchange | 0.00368 | (0.96) | totsellchange | -0.00152 | (-0.21) | 0.158 |
| 5cons | 2.351*** | (8.53) | totbuychange | 0.00248 | (0.80) | totholdchange | 0.00355 | (0.85) | totsellchange | -0.000458 | (-0.06) | 0.301 |
| 1cons | 0.572*** | (6.99) | amt_rec_rating | -0.00314 | (-0.57) | | | | | | | 0.221 |
| 2cons | 0.0334 | (1.63) | amt_rec_rating | -0.00459 | (-0.77) | | | | | | | 0.018 |
| 5cons | 0.165*** | (4.92) | amt_rec_rating | -0.00288 | (-0.42) | | | | | | | 0.125 |
| 1energy | 0.611*** | (4.61) | all_ambiguous | 0.00774 | (0.71) | all_negative | -0.0260 | (-1.35) | all_positive | 0.00285 | (0.22) | 0.102 |
| 2energy | 0.0701*** | (3.54) | all_ambiguous | -0.0120 | (-1.01) | all_negative | -0.0305 | (-1.43) | all_positive | 0.00398 | (0.28) | 0.075 |
| 5energy | 0.0809*** | (4.56) | all_ambiguous | -0.00481 | (-0.34) | all_negative | -0.0298 | (-1.19) | all_positive | 0.0106 | (0.63) | 0.131 |
| 1energy | -0.00407 | (-0.24) | all_ambiguous_3 | -0.00270 | (-0.30) | all_negative_3 | -0.00816 | (-0.59) | all_positive_3 | 0.00163 | (0.16) | -0.010 |
| 2energy | 0.107 | (1.89) | all_ambiguous_3 | -0.00118 | (-0.12) | all_negative_3 | -0.0119 | (-0.78) | all_positive_3 | 0.00334 | (0.30) | 0.029 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5energy | 0.652* | (2.48) | all_ambiguous_3 | 0.00364 | (0.29) | all_negative_3 | -0.0153 | (-0.80) | all_positive_3 | 0.00515 | (0.36) | 0.019 |
| 1energy | 0.168* | (2.38) | major_ambiguous_3 | 0.0157 | (0.74) | major_negative_3 | -0.0166 | (-0.48) | major_positive_3 | 0.00138 | (0.10) | 0.018 |
| 2energy | 0.00177 | (0.12) | major_ambiguous_3 | 0.0285 | (1.24) | major_negative_3 | -0.0128 | (-0.34) | major_positive_3 | 0.000121 | (0.01) | 0.001 |
| 5energy | 0.0743** | (2.73) | major_ambiguous_3 | 0.0400 | (1.34) | major_negative_3 | -0.0672 | (-1.41) | major_positive_3 | -0.0110 | (-0.60) | 0.035 |
| 1energy | 0.159 | (1.50) | rela_relativebuy | -0.0179 | (-1.02) | rela_relativesell | -0.00426 | (-0.28) | | | | -0.003 |
| 2energy | 0.0204 | (1.31) | rela_relativebuy | -0.0139 | (-0.72) | rela_relativesell | -0.0105 | (-0.64) | | | | 0.013 |
| 5energy | 0.0277* | (1.98) | rela_relativebuy | -0.0128 | (-0.55) | rela_relativesell | -0.0177 | (-0.91) | | | | 0.039 |
| 1energy | 0.139*** | (4.42) | n_pub_dmax | -0.000505 | (-0.12) | n_pub_d#stories | -0.0000163 | (-0.65) | n_read_dmax | -0.00115 | (-0.34) | 0.093 |
| 2energy | 0.931*** | (11.02) | n_pub_dmax | 0.000360 | (0.08) | n_pub_d#stories | -0.0000206 | (-0.75) | n_read_dmax | -0.000881 | (-0.24) | 0.425 |
| 5energy | 3.860*** | (11.00) | n_pub_dmax | 0.00337 | (0.59) | n_pub_d#stories | -0.0000394 | (-1.19) | n_read_dmax | 0.00220 | (0.48) | 0.422 |
| 1energy | 1.196*** | (12.86) | totbuychange | 0.00000132 | (0.00) | totholdchange | -0.00234 | (-0.25) | totsellchange | 0.0241 | (1.39) | 0.499 |
| 2energy | 0.0937** | (3.00) | totbuychange | -0.00336 | (-0.43) | totholdchange | 0.00299 | (0.29) | totsellchange | 0.0125 | (0.65) | 0.045 |
| 5energy | 0.341*** | (7.54) | totbuychange | 0.00531 | (0.56) | totholdchange | 0.00519 | (0.42) | totsellchange | 0.0185 | (0.82) | 0.244 |
| 1energy | 1.585*** | (9.13) | amt_rec_rating | 0.0337* | (2.30) | | | | | | | 0.335 |
| 2energy | 0.140*** | (4.89) | amt_rec_rating | 0.0265 | (1.62) | | | | | | | 0.112 |
| 5energy | 0.165*** | (5.99) | amt_rec_rating | 0.0290 | (1.32) | | | | | | | 0.190 |
| 1finan | 0.0396 | (1.80) | all_ambiguous | -0.00122 | (-0.30) | all_negative | 0.00670 | (0.97) | all_positive | 0.00615 | (1.33) | 0.005 |
| 2finan | 0.381*** | (5.76) | all_ambiguous | -0.00757 | (-1.54) | all_negative | 0.00156 | (0.18) | all_positive | 0.00622 | (1.08) | 0.165 |
| 5finan | 2.342*** | (8.56) | all_ambiguous | -0.00614 | (-1.10) | all_negative | -0.000591 | (-0.06) | all_positive | 0.00818 | (1.27) | 0.304 |
| 1finan | 0.573*** | (7.20) | all_ambiguous_3 | -0.00163 | (-0.45) | all_negative_3 | -0.00451 | (-0.83) | all_positive_3 | -0.00157 | (-0.39) | 0.232 |
| 2finan | 0.0365 | (1.84) | all_ambiguous_3 | -0.00128 | (-0.30) | all_negative_3 | -0.00266 | (-0.41) | all_positive_3 | -0.000318 | (-0.07) | 0.012 |
| 5finan | 0.159*** | (4.74) | all_ambiguous_3 | 0.000972 | (0.19) | all_negative_3 | -0.00804 | (-1.06) | all_positive_3 | -0.000501 | (-0.09) | 0.103 |
| 1finan | 0.611*** | (4.79) | major_ambiguous_3 | -0.00751 | (-0.89) | major_negative_3 | 0.0174 | (1.30) | major_positive_3 | -0.00689 | (-1.35) | 0.117 |
| 2finan | 0.0707*** | (3.63) | major_ambiguous_3 | -0.000768 | (-0.08) | major_negative_3 | 0.00398 | (0.25) | major_positive_3 | -0.00894 | (-1.46) | 0.057 |
| 5finan | 0.0848*** | (4.86) | major_ambiguous_3 | 0.00495 | (0.43) | major_negative_3 | -0.00433 | (-0.23) | major_positive_3 | -0.0115 | (-1.62) | 0.136 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1finan | 0.00476 | (0.29) | rela_relativebuy | 0.00307 | (0.48) | rela_relativesell | -0.0111* | (-2.07) | | | | -0.016 |
| 2finan | 0.154** | (2.81) | rela_relativebuy | 0.00264 | (0.34) | rela_relativesell | -0.0147* | (-2.21) | | | | 0.039 |
| 5finan | 0.730** | (2.84) | rela_relativebuy | 0.00229 | (0.26) | rela_relativesell | -0.0160* | (-2.15) | | | | 0.038 |
| 1finan | 0.190** | (2.77) | n_pub_dmax | 0.000172 | (0.11) | n_pub_d#stories | -0.00000512 | (-0.55) | n_read_dmax | 0.00149 | (1.14) | 0.030 |
| 2finan | 0.0118 | (0.81) | n_pub_dmax | 0.000122 | (0.06) | n_pub_d#stories | -0.00000723 | (-0.64) | n_read_dmax | 0.00230 | (1.50) | -0.004 |
| 5finan | 0.0765** | (2.82) | n_pub_dmax | 0.00180 | (0.82) | n_pub_d#stories | -0.0000161 | (-1.26) | n_read_dmax | 0.00279 | (1.56) | 0.026 |
| 1finan | 0.186 | (1.80) | totbuychange | 0.00512* | (2.01) | totholdchange | 0.00485 | (1.43) | totsellchange | 0.000352 | (0.06) | 0.010 |
| 2finan | 0.0286 | (1.88) | totbuychange | 0.00496 | (1.60) | totholdchange | 0.00781 | (1.89) | totsellchange | -0.000606 | (-0.08) | 0.001 |
| 5finan | 0.0386** | (2.80) | totbuychange | 0.00726* | (2.07) | totholdchange | 0.00717 | (1.53) | totsellchange | 0.00119 | (0.14) | 0.055 |
| 1finan | 0.142*** | (4.53) | amt_rec_rating | -0.00807 | (-1.28) | | | | | | | 0.098 |
| 2finan | 0.944*** | (11.21) | amt_rec_rating | -0.0113 | (-1.58) | | | | | | | 0.426 |
| 5finan | 3.886*** | (11.12) | amt_rec_rating | -0.00860 | (-0.96) | | | | | | | 0.426 |
| 1health | 1.169*** | (12.73) | all_ambiguous | 0.00201 | (1.36) | all_negative | 0.00167 | (0.59) | all_positive | 0.000543 | (0.29) | 0.503 |
| 2health | 0.0958** | (3.05) | all_ambiguous | 0.00151 | (1.00) | all_negative | 0.00137 | (0.48) | all_positive | 0.000577 | (0.30) | 0.041 |
| 5health | 0.337*** | (7.52) | all_ambiguous | 0.00163 | (1.06) | all_negative | 0.00108 | (0.37) | all_positive | 0.000459 | (0.24) | 0.249 |
| 1health | 1.586*** | (9.07) | all_ambiguous_3 | 0.00201 | (1.77) | all_negative_3 | -0.000478 | (-0.27) | all_positive_3 | 0.000712 | (0.57) | 0.325 |
| 2health | 0.138*** | (4.84) | all_ambiguous_3 | 0.00204 | (1.74) | all_negative_3 | -0.000592 | (-0.32) | all_positive_3 | 0.000700 | (0.54) | 0.117 |
| 5health | 0.159*** | (5.71) | all_ambiguous_3 | 0.00227 | (1.89) | all_negative_3 | -0.00108 | (-0.59) | all_positive_3 | 0.000507 | (0.38) | 0.168 |
| 1health | 0.0403 | (1.81) | major_ambiguous_3 | 0.00142 | (0.55) | major_negative_3 | -0.00459 | (-1.05) | major_positive_3 | -0.00124 | (-0.72) | 0.004 |
| 2health | 0.380*** | (5.70) | major_ambiguous_3 | 0.00194 | (0.74) | major_negative_3 | -0.00546 | (-1.23) | major_positive_3 | -0.00128 | (-0.73) | 0.154 |
| 5health | 2.351*** | (8.55) | major_ambiguous_3 | 0.00231 | (0.87) | major_negative_3 | -0.00582 | (-1.27) | major_positive_3 | -0.00155 | (-0.87) | 0.302 |
| 1health | 0.569*** | (7.24) | rela_relativebuy | -0.0000657 | (-0.03) | rela_relativesell | -0.00121 | (-0.57) | | | | 0.251 |
| 2health | 0.0357 | (1.78) | rela_relativebuy | 0.000144 | (0.06) | rela_relativesell | -0.00165 | (-0.76) | | | | 0.006 |
| 5health | 0.158*** | (4.72) | rela_relativebuy | 0.000135 | (0.05) | rela_relativesell | -0.00185 | (-0.85) | | | | 0.110 |
| 1health | 0.604*** | (4.68) | n_pub_dmax | -0.00160** | (-2.81) | n_pub_d#stories | 0.00000691* | (2.14) | n_read_dmax | 0.000491 | (1.16) | 0.104 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2health | 0.0701*** | (3.58) | n_pub_dmax | -0.00155** | (-2.65) | n_pub_d#stories | 0.00000637 | (1.93) | n_read_dmax | 0.000566 | (1.31) | 0.063 |
| 5health | 0.0830*** | (4.72) | n_pub_dmax | -0.00136* | (-2.29) | n_pub_d#stories | 0.00000544 | (1.62) | n_read_dmax | 0.000607 | (1.37) | 0.122 |
| 1health | 0.00217 | (0.13) | totbuychange | 0.000599 | (0.64) | totholdchange | -0.00108 | (-0.84) | totsellchange | -0.00225 | (-0.88) | -0.016 |
| 2health | 0.130* | (2.37) | totbuychange | 0.000696 | (0.73) | totholdchange | -0.000820 | (-0.62) | totsellchange | -0.00227 | (-0.87) | 0.017 |
| 5health | 0.643* | (2.52) | totbuychange | 0.000892 | (0.93) | totholdchange | -0.000818 | (-0.62) | totsellchange | -0.00210 | (-0.80) | 0.025 |
| 1health | 0.178** | (2.64) | amt_rec_rating | -0.00358* | (-2.02) | | | | | | | 0.047 |
| 2health | 0.00530 | (0.37) | amt_rec_rating | -0.00369* | (-2.02) | | | | | | | -0.013 |
| 5health | 0.0709** | (2.66) | amt_rec_rating | -0.00339 | (-1.82) | | | | | | | 0.030 |
| 1indu | 0.158 | (1.55) | all_ambiguous | -0.000782 | (-0.37) | all_negative | -0.000355 | (-0.09) | all_positive | -0.00127 | (-0.50) | -0.003 |
| 2indu | 0.0251 | (1.67) | all_ambiguous | -0.00280 | (-1.22) | all_negative | -0.00148 | (-0.36) | all_positive | -0.000891 | (-0.32) | 0.006 |
| 5indu | 0.0342* | (2.55) | all_ambiguous | -0.00247 | (-1.02) | all_negative | -0.00274 | (-0.64) | all_positive | -0.000371 | (-0.13) | 0.040 |
| 1indu | 0.140*** | (4.43) | all_ambiguous_3 | -0.00324 | (-1.82) | all_negative_3 | -0.0000713 | (-0.03) | all_positive_3 | -0.00174 | (-0.88) | 0.093 |
| 2indu | 0.929*** | (11.04) | all_ambiguous_3 | -0.00319 | (-1.68) | all_negative_3 | 0.000132 | (0.04) | all_positive_3 | -0.00142 | (-0.68) | 0.431 |
| 5indu | 3.905*** | (11.06) | all_ambiguous_3 | -0.00291 | (-1.40) | all_negative_3 | -0.00112 | (-0.36) | all_positive_3 | -0.00107 | (-0.46) | 0.423 |
| 1indu | 1.171*** | (12.51) | major_ambiguous_3 | -0.00144 | (-0.34) | major_negative_3 | 0.000573 | (0.08) | major_positive_3 | 0.0000702 | (0.03) | 0.490 |
| 2indu | 0.108*** | (3.54) | major_ambiguous_3 | 0.000480 | (0.11) | major_negative_3 | -0.00311 | (-0.42) | major_positive_3 | -0.000195 | (-0.07) | 0.089 |
| 5indu | 0.340*** | (7.52) | major_ambiguous_3 | 0.00251 | (0.51) | major_negative_3 | -0.00623 | (-0.78) | major_positive_3 | -0.00176 | (-0.58) | 0.247 |
| 1indu | 1.582*** | (9.08) | rela_relativebuy | -0.000697 | (-0.20) | rela_relativesell | -0.00107 | (-0.37) | | | | 0.337 |
| 2indu | 0.137*** | (4.76) | rela_relativebuy | -0.000269 | (-0.07) | rela_relativesell | -0.00235 | (-0.74) | | | | 0.112 |
| 5indu | 0.154*** | (5.61) | rela_relativebuy | -0.000498 | (-0.13) | rela_relativesell | -0.00302 | (-0.91) | | | | 0.194 |
| 1indu | 0.0388 | (1.74) | n_pub_dmax | -0.000498 | (-0.59) | n_pub_d#stories | 0.000000244 | (0.05) | n_read_dmax | 0.000415 | (0.62) | 0.002 |
| 2indu | 0.370*** | (5.54) | n_pub_dmax | -0.000547 | (-0.60) | n_pub_d#stories | -0.000000903 | (-0.17) | n_read_dmax | 0.000702 | (0.99) | 0.165 |
| 5indu | 2.359*** | (8.51) | n_pub_dmax | 0.0000499 | (0.05) | n_pub_d#stories | -0.00000406 | (-0.73) | n_read_dmax | 0.000926 | (1.21) | 0.300 |
| 1indu | 0.567*** | (7.07) | totbuychange | 0.0000267 | (0.02) | totholdchange | 0.000259 | (0.14) | totsellchange | -0.00137 | (-0.41) | 0.234 |
| 2indu | 0.0445* | (2.27) | totbuychange | 0.0000416 | (0.03) | totholdchange | 0.00113 | (0.56) | totsellchange | -0.00187 | (-0.50) | 0.048 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5indu | 0.161*** | (4.79) | totbuychange | 0.000808 | (0.52) | totholdchange | 0.00109 | (0.52) | totsellchange | -0.00135 | (-0.35) | 0.110 |
| 1indu | 0.586*** | (4.48) | amt_rec_rating | -0.00440 | (-1.44) | | | | | | | 0.109 |
| 2indu | 0.0700*** | (3.49) | amt_rec_rating | -0.00522 | (-1.61) | | | | | | | 0.058 |
| 5indu | 0.0808*** | (4.71) | amt_rec_rating | -0.00486 | (-1.35) | | | | | | | 0.154 |
| 1materials | 0.00255 | (0.16) | all_ambiguous | -0.0108 | (-1.55) | all_negative | 0.0107 | (0.85) | all_positive | -0.00472 | (-0.57) | -0.017 |
| 2materials | 0.142** | (2.64) | all_ambiguous | -0.0162* | (-2.05) | all_negative | 0.00619 | (0.43) | all_positive | -0.00233 | (-0.24) | 0.045 |
| 5materials | 0.660* | (2.61) | all_ambiguous | -0.0149 | (-1.75) | all_negative | 0.00135 | (0.09) | all_positive | -0.00214 | (-0.21) | 0.023 |
| 1materials | 0.186** | (2.74) | all_ambiguous_3 | 0.00328 | (0.57) | all_negative_3 | 0.00443 | (0.50) | all_positive_3 | 0.00593 | (0.93) | 0.039 |
| 2materials | 0.00627 | (0.44) | all_ambiguous_3 | 0.00343 | (0.53) | all_negative_3 | 0.00360 | (0.36) | all_positive_3 | 0.00520 | (0.72) | 0.019 |
| 5materials | 0.0748** | (2.81) | all_ambiguous_3 | 0.00610 | (0.85) | all_negative_3 | -0.00230 | (-0.21) | all_positive_3 | 0.00494 | (0.61) | 0.030 |
| 1materials | 0.155 | (1.51) | major_ambiguous_3 | 0.0129 | (0.99) | major_negative_3 | 0.00107 | (0.05) | major_positive_3 | 0.0145 | (1.72) | 0.012 |
| 2materials | 0.0278 | (1.80) | major_ambiguous_3 | 0.0188 | (1.29) | major_negative_3 | -0.0138 | (-0.57) | major_positive_3 | 0.0118 | (1.24) | 0.010 |
| 5materials | 0.0397** | (3.10) | major_ambiguous_3 | 0.0255 | (1.55) | major_negative_3 | -0.0202 | (-0.74) | major_positive_3 | 0.00703 | (0.67) | 0.090 |
| 1materials | 0.140*** | (4.47) | rela_relativebuy | 0.00263 | (0.23) | rela_relativesell | 0.00613 | (0.63) | | | | 0.119 |
| 2materials | 0.937*** | (11.04) | rela_relativebuy | 0.00490 | (0.38) | rela_relativesell | -0.00118 | (-0.11) | | | | 0.422 |
| 5materials | 3.995*** | (11.37) | rela_relativebuy | 0.00310 | (0.22) | rela_relativesell | -0.00357 | (-0.30) | | | | 0.435 |
| 1materials | 1.157*** | (12.70) | n_pub_dmax | 0.00396 | (1.45) | n_pub_d#stories | 0.0000148 | (0.93) | n_read_dmax | -0.00191 | (-0.90) | 0.515 |
| 2materials | 0.0910** | (2.93) | n_pub_dmax | 0.00389 | (1.23) | n_pub_d#stories | 0.00000751 | (0.41) | n_read_dmax | -0.000695 | (-0.29) | 0.061 |
| 5materials | 0.336*** | (7.44) | n_pub_dmax | 0.00574 | (1.71) | n_pub_d#stories | -0.00000280 | (-0.14) | n_read_dmax | 0.000176 | (0.07) | 0.246 |
| 1materials | 1.574*** | (8.97) | totbuychange | -0.00203 | (-0.45) | totholdchange | -0.00260 | (-0.43) | totsellchange | -0.0143 | (-1.26) | 0.327 |
| 2materials | 0.137*** | (4.79) | totbuychange | -0.00105 | (-0.21) | totholdchange | 0.00161 | (0.23) | totsellchange | -0.0140 | (-1.06) | 0.118 |
| 5materials | 0.157*** | (5.65) | totbuychange | 0.00233 | (0.43) | totholdchange | 0.00179 | (0.24) | totsellchange | -0.0103 | (-0.74) | 0.175 |
| 1materials | 0.0432 | (1.93) | amt_rec_rating | 0.00277 | (0.29) | | | | | | | 0.031 |
| 2materials | 0.377*** | (5.58) | amt_rec_rating | 0.00116 | (0.11) | | | | | | | 0.154 |
| 5materials | 2.414*** | (8.64) | amt_rec_rating | 0.00331 | (0.28) | | | | | | | 0.304 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1tech | 0.560*** | (7.23) | all_ambiguous | 0.000214 | (0.16) | all_negative | -0.00235 | (-0.95) | all_positive | -0.000112 | (-0.07) | 0.272 |
| 2tech | 0.0313 | (1.57) | all_ambiguous | -0.000611 | (-0.43) | all_negative | -0.00278 | (-1.09) | all_positive | 0.0000647 | (0.04) | 0.026 |
| 5tech | 0.158*** | (4.68) | all_ambiguous | -0.000452 | (-0.31) | all_negative | -0.00338 | (-1.28) | all_positive | 0.000382 | (0.22) | 0.108 |
| 1tech | 0.602*** | (4.62) | all_ambiguous_3 | -0.000238 | (-0.21) | all_negative_3 | 0.000700 | (0.41) | all_positive_3 | -0.00251* | (-2.04) | 0.109 |
| 2tech | 0.0690*** | (3.45) | all_ambiguous_3 | -0.000265 | (-0.23) | all_negative_3 | 0.000779 | (0.44) | all_positive_3 | -0.00236 | (-1.86) | 0.061 |
| 5tech | 0.0799*** | (4.55) | all_ambiguous_3 | -0.0000330 | (-0.03) | all_negative_3 | 0.000181 | (0.10) | all_positive_3 | -0.00243 | (-1.77) | 0.127 |
| 1tech | 0.00247 | (0.15) | major_ambiguous_3 | -0.000766 | (-0.30) | major_negative_3 | -0.00101 | (-0.24) | major_positive_3 | -0.000940 | (-0.57) | 0.009 |
| 2tech | 0.128* | (2.34) | major_ambiguous_3 | -0.0000189 | (-0.01) | major_negative_3 | -0.00233 | (-0.53) | major_positive_3 | -0.00106 | (-0.62) | 0.021 |
| 5tech | 0.634* | (2.46) | major_ambiguous_3 | 0.000930 | (0.33) | major_negative_3 | -0.00355 | (-0.76) | major_positive_3 | -0.00148 | (-0.83) | 0.017 |
| 1tech | 0.176** | (2.70) | rela_relativebuy | -0.000358 | (-0.16) | rela_relativesell | -0.00135 | (-0.71) | | | | 0.072 |
| 2tech | 0.00581 | (0.42) | rela_relativebuy | -0.000204 | (-0.09) | rela_relativesell | -0.00189 | (-0.96) | | | | 0.012 |
| 5tech | 0.0714** | (2.68) | rela_relativebuy | -0.000281 | (-0.12) | rela_relativesell | -0.00216 | (-1.07) | | | | 0.030 |
| 1tech | 0.162 | (1.60) | n_pub_dmax | -0.000123 | (-0.22) | n_pub_d#stories | -0.000000108 | (-0.03) | n_read_dmax | 0.000442 | (1.04) | 0.006 |
| 2tech | 0.0231 | (1.51) | n_pub_dmax | -0.000136 | (-0.24) | n_pub_d#stories | -0.000000486 | (-0.15) | n_read_dmax | 0.000534 | (1.22) | 0.007 |
| 5tech | 0.0320* | (2.42) | n_pub_dmax | 0.000106 | (0.18) | n_pub_d#stories | -0.00000209 | (-0.62) | n_read_dmax | 0.000723 | (1.56) | 0.046 |
| 1tech | 0.142*** | (4.60) | totbuychange | 0.000870 | (0.98) | totholdchange | 0.000886 | (0.74) | totsellchange | 0.00327 | (1.46) | 0.121 |
| 2tech | 0.942*** | (11.26) | totbuychange | 0.000821 | (0.90) | totholdchange | 0.00127 | (1.03) | totsellchange | 0.00291 | (1.26) | 0.429 |
| 5tech | 3.928*** | (11.51) | totbuychange | 0.00125 | (1.32) | totholdchange | 0.00125 | (0.98) | totsellchange | 0.00343 | (1.44) | 0.448 |
| 1tech | 1.186*** | (12.85) | amt_rec_rating | -0.000747 | (-0.40) | | | | | | | 0.497 |
| 2tech | 0.101** | (3.29) | amt_rec_rating | -0.00115 | (-0.60) | | | | | | | 0.069 |
| 5tech | 0.341*** | (7.71) | amt_rec_rating | -0.000846 | (-0.41) | | | | | | | 0.263 |
| 1util | 1.573*** | (9.07) | all_ambiguous | 0.00117 | (0.89) | all_negative | -0.000140 | (-0.06) | all_positive | -0.00269 | (-1.65) | 0.328 |
| 2util | 0.140*** | (4.95) | all_ambiguous | 0.000237 | (0.18) | all_negative | -0.000367 | (-0.14) | all_positive | -0.00266 | (-1.58) | 0.120 |
| 5util | 0.162*** | (5.82) | all_ambiguous | 0.000391 | (0.28) | all_negative | -0.00121 | (-0.45) | all_positive | -0.00241 | (-1.36) | 0.163 |
| 1util | 0.0449* | (2.05) | all_ambiguous_3 | 0.000304 | (0.30) | all_negative_3 | -0.000544 | (-0.35) | all_positive_3 | -0.00262* | (-2.37) | 0.032 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2util | 0.387*** | (5.79) | all_ambiguous_3 | 0.000126 | (0.13) | all_negative_3 | -0.000201 | (-0.13) | all_positive_3 | -0.00248* | (-2.24) | 0.158 |
| 5util | 2.346*** | (8.74) | all_ambiguous_3 | 0.000386 | (0.35) | all_negative_3 | -0.00116 | (-0.68) | all_positive_3 | -0.00243 | (-1.96) | 0.319 |
| 1util | 0.590*** | (7.43) | major_ambiguous_3 | -0.00455* | (-1.99) | major_negative_3 | -0.00243 | (-0.63) | major_positive_3 | -0.00293 | (-1.92) | 0.244 |
| 2util | 0.0413* | (2.09) | major_ambiguous_3 | -0.00368 | (-1.62) | major_negative_3 | -0.00406 | (-1.04) | major_positive_3 | -0.00285 | (-1.86) | 0.033 |
| 5util | 0.165*** | (5.00) | major_ambiguous_3 | -0.00260 | (-1.04) | major_negative_3 | -0.00564 | (-1.32) | major_positive_3 | -0.00368* | (-2.21) | 0.128 |
| 1util | 0.602*** | (4.66) | rela_relativebuy | 0.00273 | (1.29) | rela_relativesell | -0.00126 | (-0.67) | | | | 0.108 |
| 2util | 0.0722*** | (3.69) | rela_relativebuy | 0.00283 | (1.33) | rela_relativesell | -0.00194 | (-1.02) | | | | 0.066 |
| 5util | 0.0845*** | (4.74) | rela_relativebuy | 0.00304 | (1.34) | rela_relativesell | -0.00226 | (-1.13) | | | | 0.111 |
| 1util | 0.00519 | (0.32) | n_pub_dmax | 0.000415 | (0.82) | n_pub_d#stories | -0.00000255 | (-0.89) | n_read_dmax | 0.000882* | (2.34) | 0.007 |
| 2util | 0.131* | (2.38) | n_pub_dmax | 0.000353 | (0.69) | n_pub_d#stories | -0.00000281 | (-0.98) | n_read_dmax | 0.000984** | (2.63) | 0.019 |
| 5util | 0.655** | (2.61) | n_pub_dmax | 0.000734 | (1.37) | n_pub_d#stories | -0.00000490 | (-1.62) | n_read_dmax | 0.00112** | (2.80) | 0.036 |
| 1util | 0.184** | (2.68) | totbuychange | 0.00161 | (1.94) | totholdchange | 0.000613 | (0.54) | totsellchange | 0.00385 | (1.71) | 0.029 |
| 2util | 0.00884 | (0.62) | totbuychange | 0.00163 | (1.93) | totholdchange | 0.00105 | (0.90) | totsellchange | 0.00366 | (1.58) | 0.009 |
| 5util | 0.0752** | (2.83) | totbuychange | 0.00194* | (2.18) | totholdchange | 0.000945 | (0.77) | totsellchange | 0.00365 | (1.50) | 0.042 |
| 1util | 0.155 | (1.51) | amt_rec_rating | 0.000150 | (0.09) | | | | | | | 0.002 |
| 2util | 0.0259 | (1.72) | amt_rec_rating | -0.000263 | (-0.16) | | | | | | | 0.006 |
| 5util | 0.0341* | (2.49) | amt_rec_rating | 0.000121 | (0.07) | | | | | | | 0.026 |

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