The Impact of Foreign Investment Restrictions on the Stock Returns of Oil Sands Companies

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Abstract

On December 7, 2012 the Government of Canada released a policy statement and revised the guidelines for investments by State-Owned Enterprises in the Canadian oil sands. This policy statement was in response to the proposed purchase of Nexen by the Chinese SOE, CNOOC. According to the new guidelines, foreign investors must convince the Minister of Industry that a particular investment is likely to be of net benefit to Canada and those investments by foreign SOEs to acquire controlling interests in a Canadian oil sands company will be found to be of net benefit on an exceptional basis only. The purpose of this paper is to examine the impact of this announced policy change on the stock returns of firms operating in the oil sands. We employ an event study analysis to examine the impact of the policy change on the oil sands share price return after the announcement. We find that the announced changes to foreign investment in the oil sands significantly reduced stock returns in that industry and had a much larger negative impact on smaller oil sands companies (the juniors).

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"When we say that Canada is open for business, we do not mean that Canada is for sale to foreign governments."
-Prime Minister Stephen Harper, Dec. 7, 2012

"…going forward, the Minister (of Industry) will find the acquisition of control of a Canadian oil-sands business by a state-owned enterprise to be of net benefit, only in an exceptional circumstance."
-Prime Minister Stephen Harper, Dec. 7, 2012

"A year after the new Investment Canada Act rules were announced in December 2012, investment dollars from state-owned enterprises have essentially stopped flowing into the bitumen extraction business. Energy-directed foreign direct investment – of which SOEs play an important role – fell off a cliff in 2013, declining 92 per cent year-to-year from $27 billion to $2 billion. These are very worrisome statistics for a nation highly dependent on foreign investment to fund its capital-intensive resource industries."
-Jim Prentice, December 2, 2013 Published at Alberta Oil Magazine

1. Introduction

On December 7, 2012, Prime Minister Harper, in a press conference following the close of markets, announced the approval of the acquisition of the Canadian energy firm, Nexen, by the Chinese State Owned Enterprise (SOE), China National Offshore Oil Corporation (CNOOC). The Prime Minister subsequently, and during the same press conference, announced revised guidelines intended to halt further oil sands acquisitions by SOEs, stating outright that the decision on CNOOC was "the end of a trend and not the beginning of a trend."[2]

The revised policy guidelines have had their intended effect on SOE investment: there was only one announced SOE deal in 2013 (outside of the oil sands sector), worth approximately $320 million, compared to $28 billion in the previous year.[3] According to Jim Prentice, Foreign Direct Investment (FDI) into the Canadian energy sector, where SOEs have been major players, "fell off a cliff" in 2013 after the announced changes to the Investment Canada Act (ICA). Prentice (2013) notes that FDI into the Canadian energy sector declined 92 percent in 2013 year-to-year from $27 billion to $2 billion. As we discuss below, other sources of investment have failed to materialize in the industry. That investment has declined in the industry following the announced changes to the ICA is well documented and supported by the data. However, there is an important debate on the

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[2] See the announcement by the Government of Canada (2012).

[3] On January 20, 2014, Chinese state-owned Yanchang Petroleum International Limited completed the acquisition of Novus Energy for $320 million.

cause of the decline in investment, and on the impact of this decline on the industry. On the one hand, some observers like Prentice argue that the new rules led to the decline. Others have argued that other challenges in the industry led to the reduction in investment, including: higher capital and operating costs, increased environmental regulations, the emergence of other investment options (outside of the oil sands), and delays in infrastructure of getting the product to the market. For example, Cattaneo (2014) reports that according to Grant Ukrainetz from the Korean SOE, KNOC, other challenges have contributed to reduced investment in the sector.

> *"Capital cost pressures in the oil sands have tripled, operating costs in the oil sands at least doubled, we had a change in the oil sands royalty regime, we had greater environmental regulations, costs of compliance have increased, we had continued delays in pipelines that allow us to move products out to maximize revenue, (there is) negative public sentiment toward the oil sands, plus you have the emergence of other opportunities in the U.S. and elsewhere."[4]*

Whether, and the extent to which, the changes in the ICA adversely affected the oil sands industry is an empirical question. However, until now we have relied on anecdotal evidence and there is no empirical evidence on the impact of the policy change on the industry. We empirically examine the impact of the ICA changes and control for other potential mitigating factors. We employ an event study analysis to empirically examine the impact of the December 7, 2012 announcement to restrict SOE investment in the oil sands on the stock returns of firms operating in the sector. This approach allows us to control for other factors that may have affected stock returns in the sector.

This is the first econometric evidence of the impact of the announced restrictions on SOE investment in the Canadian oil sands. Although the policy change is specifically targeting controlling interests by SOEs, it is possible that the new restrictions could have unintended consequences on capital costs and investment in the industry more broadly. We conjecture that the policy changes could have implications for all forms of financing in the oil sands sector and not narrowly limited to the prospect of an oil sands acquisition by an SOE (although important when considered in isolation). According to our hypothesis, reducing foreign direct investment, a complementary source of capital, decreases the overall supply of capital to the oil sands sector, and therefore aggregate capital becomes more expensive. Moreover, there are other periphery

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[4] Reported by Cattaneo (2014).

considerations to the revised policy guidelines that potentially make financing more difficult and expensive for oil sands firms. For example, in the capital-intensive oil industry with large fixed and sunk costs, oil sands firms (especially the juniors) typically engage in joint ventures (JVs) for their projects. It is possible that the policy changes have impacted this practice even though the intent was to eliminate acquisitions in controlling interests (not JVs). This is because it is commonplace in the event of default in a JV agreement to compensate the non-defaulting by absorbing the defaulting party's interest in a given project. However, the revised guidelines prohibit acquisitions of control by an SOE in the oil sands sector, unless in exceptional circumstances. This constraint on a traditional form of compensation due to a default may deter SOEs from entering into JV partnerships with oil sands firms. Although we do not directly examine this channel of the impact of the ICA policy because we do not have data on JV activity, our analysis allows us to directly examine the impact on stock prices. The loss impact of access to capital will be capitalized into the stock prices of the firms affected. It is likely that the unintended consequences on JVs will impact junior oil sands firms more than the intermediates/seniors. We are able to disentangle the impact of the ICA on smaller oil sands firms (juniors) from intermediates/seniors and examine whether these different types of firms were impacted differently.

In particular, using the event study framework, we examine whether the policy change resulted in negative abnormal returns for oil sands firms. We examine the stock return data of 17 firms operating in the Canadian oil sands pre- and post-announced changes to the ICA and we control for other factors including the stock market, oil prices, the risk free interest rate, and the exchange rate. Since stock returns on individual firms can also be affected by firm behavior unconnected to changes in the industry wide policy, we employ a fixed effect model to control for idiosyncratic firm effects. We find that the changes to the ICA reduce the stock returns of oil sands companies and that the negative impact was much larger on smaller oil sand firms (the juniors). These results are robust to different model specifications and control for other factors that could be affecting the sector. We argue that the impact of the policy changes, and subsequent reduction in oil sands investment, has increased the cost of capital and the ability of oil sands firms to raise funds. That we find a larger (negative) impact on the oil sands juniors reflects the fact that they are more reliant on external sources of financing due to limited internal cash flow from early stage operations. These results are consistent with our hypothesis that other financing options such as JVs have become collateral damage from the changes to the ICA.

The paper is organized as follows. Section 2 presents an overview of the oil sands resource, the current level of foreign ownership and the revised guidelines for SOE investment. Section 3 provides an overview of the data on stock returns and computes abnormal returns. Section 4 presents the econometric model and the empirical results. Section 5 concludes.

2. Background on the oil sands and investment policy

Canada ranks third among countries in proven global oil reserves (after Venezuela and Saudi Arabia),[5] with 97% of Canada's 174 billion barrels reserves found in the oil sands. Figure 1 presents the location of the main oil sands deposits in Canada. Current oil sands production is approximately 1.7 million barrels per day,[6] representing a fraction of the total recoverable resource base. At the present time, mining operations account for a slightly higher percentage of total oil sands production; in situ oil sands projects are expected to dominate future production.[7]

The oil sands resource is unique: projects are characterized by 1) a long reserve life and 2) being relatively capital intensive, with significant initial outlays required prior to first production. The Canadian Energy Research Institute (CERI) forecasts that to achieve full development, oil sands projects will require $100 billion in capital investment through 2019.[8] Prior to the revised guidelines, the trend was one of increasing SOE investment in the oil sands, with Asian acquirers, almost exclusively SOE type entities, as the dominant recent providers of foreign direct investment. Figure 2 provides an overview Mergers and Acquisitions (M&A) activity in the Canadian oil sands from 1999-2000. The figure presents the number and the value of the transactions by year, the price of oil, and the share of Asian acquirers in the transactions. Although the share of Asian acquirers does not specifically measure SOE activity, it is safe to infer that the Asia numbers do reflect SOE activity in the sector.

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[5] Source: US Energy Information Agency.

[6] Source: Canadian Association of Petroleum Producers.

[7] Economics dictate that oil sands deposits are only minable within 75 meters of the surface; otherwise in situ technology is applied. Due to geology, 80% of the recoverable resource will be extracted using in situ versus mining methods.

[8] Canadian Energy Research Institute. Canadian Oil Sands Supply Costs and Development Projects (2012-2046). Study No. 133. May, 2013.
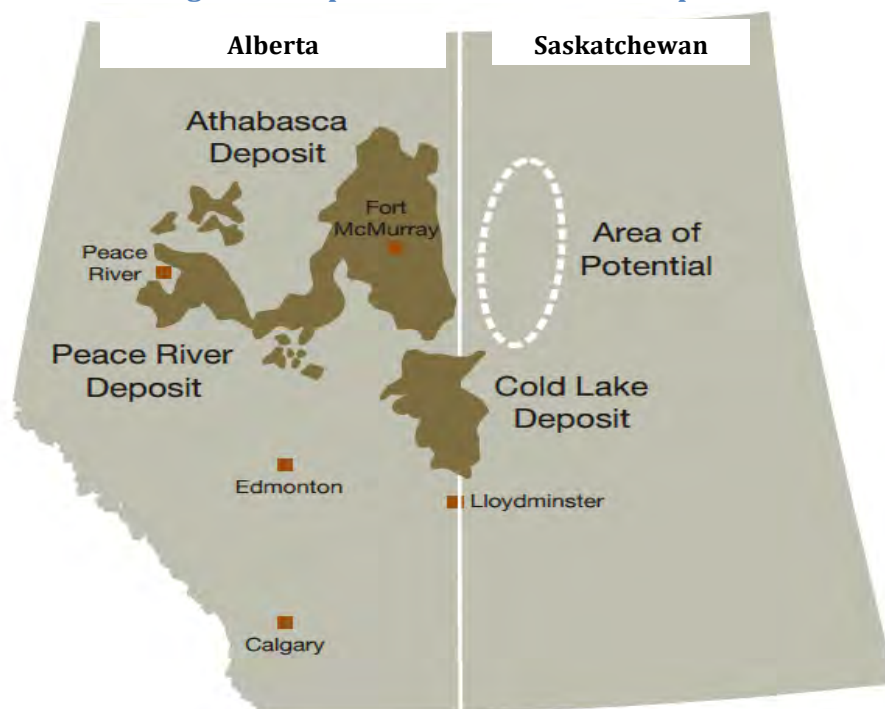
Source: Canadian Association of Petroleum Producers

Still, despite the acceleration of SOE investment into the oil sands sector depicted in Figure 2, SOE ownership of the oil sands resource is currently immaterial. It is difficult to obtain good measures of the extent of SOE activity in the industry. However, it is possible to compare over-all foreign ownership in Canada (Table 1) to foreign control in the oil and gas sector (Table 2) to learn that foreign direct investment accounts for a much larger share of assets in the oil and gas sector (35.4% in Table 2) than in the overall economy (18.7%). According to Table 2, SOEs from all countries accounted for $26 Billion of assets in 2011, or 4.6% of the assets in the oil and gas sector. This is compared to only 0.9% of assets in all industries (Table 1). Data on oil and gas assets under control of Chinese SOEs are not available. However, given total China SOE controlled assets was $13.3Billion in 2011 (Table 1), China's SOE share in the Oil and Gas sector cannot be higher than 3% in 2011 ($13.3 Billion out of the $556 Billion in assets in oil and gas).

Figure 2: Historical Oil Sands M&A Transactions+,++
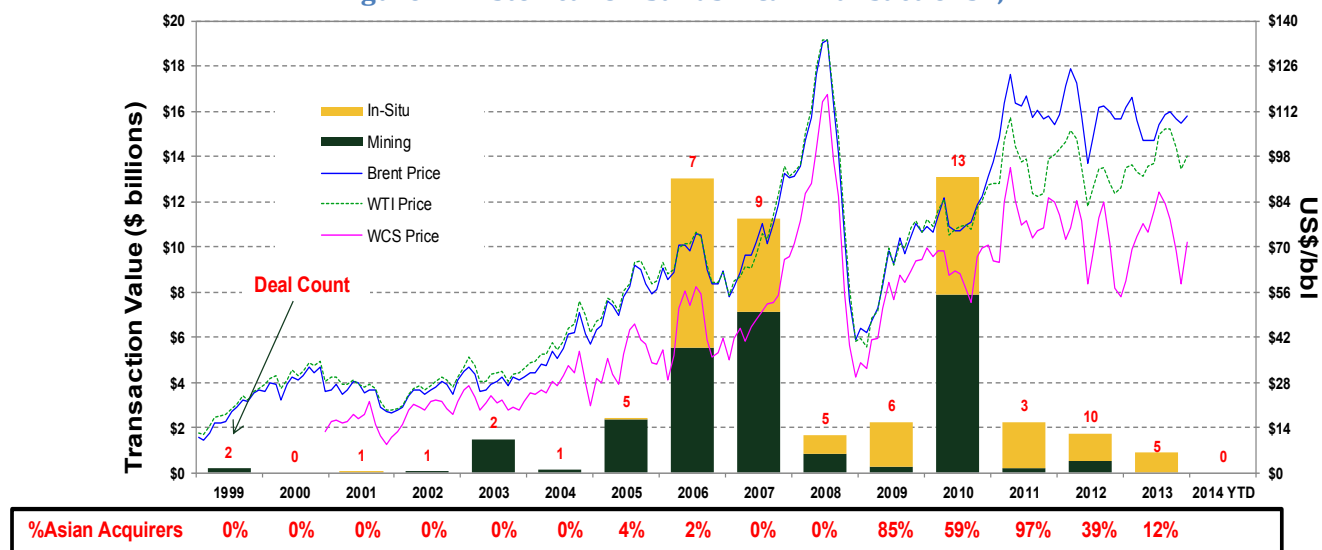
+ Source: TD Securities.
++ Does not include the Nexen acquisition, given less than 50% of Nexen's resources and current production was weighted towards oil sands.

Table 1: Total Assets, FDI and SOE Activity in all sectors in Canada ($ billion, 2008 and 2011)

All Industries	2008	2011	% of the Total in 2011	Change over 2008-2011	% Change
Total Asset	7,267.0	8,948.0	N/A	1,681.0	23%
Canadian	5,770.0	7,273.0	81.3%	1,503.0	26%
All Foreign	1,496.0	1,675.0	18.7%	179.0	12%
Private Owned Enterprise	1,462.0	1,593.0	17.8%	131.0	9%
SOE	34.2	82.0	0.9%	48.0	140%
Non-China SOE	33.6	68.7	0.8%	35.0	104%
China SOE	0.6	13.3	0.2%	13.0	2236%

Source: Statistics Canada Special tabulation and Statistics Canada, cat 61-220, 2013

Table 2 also highlights a dramatic increase in ownership of assets by SOEs in the oil and gas sector, albeit from a low base of $6 Billion in 2008 to $26 Billion in 2011 – an increase of 313% in three years. According to a recent report by IHS-CERA, total SOE ownership accounted for 6% of oil sands production in 2012, slightly above the Statistics Canada estimate.[9] That same report

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[9] IHS CERA. Special Report. Oil Sands Economic Benefits: Today and in the future. January, 2014

points out that the United States is the dominant provider of capital to the oil sands: 54% of production weighted ownership is controlled by US citizens; 29% of production weighted ownership is controlled by US corporations.[10]

Table 2: Total Assets, FDI and SOE Activity in the Oil and Gas sector in Canada ($ billion, 2008 and 2011)

Oil and Gas Sector	2008	2011	% of the Total in 2011	Change over 2008-2011	% Change
Total Asset	505	556	N/A	51	10%
Canadian	324	359	65.6%	35	11%
All Foreign	181	197	35.4%	16	9%
Private Owned Enterprise	175	171	30.8%	-4	-2%
SOE	6	26	4.6%	19	313%
Non-China SOE	x	x	N/A	N/A	N/A
China SOE	x	x	N/A	N/A	N/A

Source: Statistics Canada Special tabulation and Statistics Canada, cat 61-220, 2013. X means confidential data.

Projections are that Chinese FDI outflows will continue to increase in the short-medium term. According to Wendy Dobson (2014), looking just at its global stock of FDI (and there are lots of uncertainty about the numbers due to the use of tax havens and platforms in Hong Kong) it is generally accepted that this global stock is somewhere around 6% of China's GDP and 12th largest in global terms. Note also that measured by flows, China was the world's third largest outward investor in 2012, behind Japan and the US. The point is that if the stock ratio were to be maintained as the Chinese economy doubles in size by 2020 its global stock would grow to $700 billion, similar to those of Canada and Japan today. More bullish estimates put the stock at $1-2 trillion. Changes to the ICA essentially eliminate this source of capital from investing in controlling interests in the Canadian oil sands.

To summarize, the oil and gas industry are capital intensive and CERI forecasts that the oil sands projects will require $100 billion in capital investment in the next five years. The Canadian economy relies on foreign investment for almost 20 percent of assets, and this is higher at 35 percent in the oil and gas sector. The extent of SOE investment in the Canadian oil and gas sector is relatively small but has, until recently, been growing rapidly. SOE investments have become increasingly important in world investment in resources generally, and in the energy sector in

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[10] *ibid*

particular. The next section reviews the revised ICA with respect to SOE investment and the following section empirically estimates the impact of the changes on firms operating in the oil sands.

Revised Guidelines for Oil Sands Investments by State Owned Enterprises

The December 7, 2012 press conference outlining the revised guidelines for SOE investment, specifically targeting the oil sands sector. Bill C-60 was introduced on April 29, 2013, largely consistent with the initial policy announcement and has since received royal assent. The intent of the revised policy guidelines is to require controlling positions in the oil sands to pass a net benefit test, which would only be permitted in exceptional circumstances.

The salient features of the revised guidelines and legislation are as follows:

- Broadening the definition of SOEs to an entity directly or <u>indirectly</u> controlled by a foreign government;
- The threshold for a "net benefit" review of an SOE investment in the oil sands is triggered by a transaction representing 1) $354 million of book value of assets of a Canadian business and 2) an acquisition of control;
- This threshold is expected to rise on an enterprise value basis in annual stages for non-SOE investors, while remaining capped at book value for SOE investments;
- Under revised legislation, acquisition of control can be subject to the Minister of Industry's own discretion; and
- SOE acquisitions of control of oil sands assets must be on an "exceptional net benefit" basis only.

A careful reading of these guidelines reveals both more clarity in the rules and more uncertainty. The clarity comes from making it clear that controlling interests of oil sands firms by SOEs will not be permitted unless under exceptional circumstances reflecting Prime Minisster Harper's statement that being open for business does not mean Canada is for sale to foreign governments. On the other hand, there is greater uncertainty in broadening the definition of what defines an SOE with respect to the Act as well as what defines controlling interests. The new policy increases the discretionary power of the Minister of Industry. Moreover, although the revised policy clearly focuses on controlling interests, as we discuss above, it is possible that the rule

changes will have a broader impact on financing and investment in the oil sands. How did these policy changes affect the oil sands industry? We turn to that now.

3. Analysis of stock returns of the oil sands companies

We empirically examine the impact on publicly traded firms operating in the oil sands by analysing the impact on their stock returns. Tables 3 and 4 list the 17 firms and provide some descriptive statistics on the firms. Table 3 presents data on the size (market capital, book values of assets, and enterprise value) and the oil sands reserve concentration of the firms.[11] It is common among industry analysts to divide oil sands firms into "juniors" and "intermediates/seniors" primarily based on size. We have followed this practice and group the firms accordingly.[12] According to Table 3, there is a significant size discrepancy between junior and intermediate/senior oil sands groupings, with an average market capitalization of $576 million in the junior sector compared to $29.2 billion in the intermediate/senior sector. Compared to the $354 million asset value threshold in the ICA, only Silver Willow Energy (SWE), Alberta Oilsands (AOS), and Petrobank Energy (PBG) would fall under the threshold; Ivanhoe Energy (IE) is slightly over the threshold.

As indicated in the last column of Table 3, all of the firms, juniors and intermediates, have a minimum of 80% of their reserve volumes weighted towards oil sands with the exceptions of Baytex Energy (BTE) at 35%, Husky Energy (HSE) at 59%, and Canadian Natural Resources (CNQ) at 69%.

Tables 4 and 5 present a summary of the stock returns for the firms prior to the announced change in policy and after the policy announcement. The summary statistics are based on daily data and span the period July 28, 2010 to March 7, 2014. The time frame allows us to estimate the model prior to the announced policy change and extends to the most recent data. The start date also allows us to include the initial public offering of MEG Energy and Athabasca Oil, two largely pure play oil sands companies in the sample. All economic data is sourced from Bloomberg.

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[11] See the Appendix for a complete description of firms as well as their names.

[12] This is consistent with analyst classification of oil sands firms, although subjective and not based on stated size criteria. In general, the junior sector is distinguished by a higher reliance on external sources of financing due to early stage operations and limited operating cash flow.

Comparing Tables 4 and 5 we see that the mean returns in the intermediate/senior oil sands sector improved following the policy change, from 5% in the pre-policy period to 11% post-policy announcement. They also had lower volatility post-announcement, as evidenced by a reduced coefficient of variation. This is in stark contrast to the junior oil sands sector, where average stock returns were negative prior to the announcement (down 33% on average) and declined further post-announcement (again down 33%). For the juniors, the returns were down and the variation in returns increased from a coefficient of variation of 0.29 pre-announcement to 0.36 post-announcement. Alberta Oil Sands Inc. (AOS) was the only junior oil sands firm that demonstrated a positive share price return following the announced SOE policy change[13].

Table 3: Firm Summary Statistics[+]

	Trading Symbol	Market Cap++ - $MM	Book Value+++ of Assets - $MM	Enterprise Value++ $MM	Reserves++++ % oil sands
Juniors	SWE	18	131	8	NM
	AOS	34	76	29	NM
	PBG	41	147	-33	NM
	IE	63	368	91	100%
	CLL	124	1,252	959	100%
	STP	121	982	607	100%
	SUO	520	1,036	567	99%
	PXX	1,005	649	1,007	85%
	ATH	3,256	3,416	3,359	94%
	Mean	**576**	**895**	**733**	**96%**
Intermediate/ Seniors	BTE	5,800	2,698	6,457	35%
	MEG	8,546	9,448	11,371	100%
	COS	11,136	10,190	11,932	100%
	CVE	24,163	25,224	27,146	78%
	HSE	34,422	36,904	37,735	59%
	IMO	43,901	37,218	49,916	97%
	CNQ	47,390	51,754	57,035	69%
	SU	58,382	78,315	64,638	86%
	Mean	**29,218**	**31,469**	**33,279**	**78%**

+ Source: Bloomberg, CanOils, company reports; ++ Based on April 14, 2014 trading. +++ Most recent fiscal quarter; +++++ "NM" means not meaningful due to no assigned reserves.

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[13] The positive return of AOS over the period can be partly attributed to the cancellation of the company's Clearwater oil sands leases and the expected compensation by the Alberta government.

Table 4: Share Trading Summary Pre Policy Announcement[+,++] July 28, 2010: December 7, 2012

	Trading Symbol	Mean Share Price - $/share	Standard Deviation	Coefficient of Variation	Return
Juniors	SWE	1.11	0.17	0.15	-27%
	AOS	0.24	0.12	0.50	-74%
	PBG	1.31	0.43	0.33	-49%
	IE	4.65	2.58	0.56	-24%
	CLL	0.91	0.37	0.41	-82%
	STP	1.49	0.22	0.15	23%
	SUO	0.36	0.02	0.06	-45%
	PXX	4.82	1.50	0.31	-2%
	ATH	12.92	2.12	0.16	-14%
	Mean			**0.29**	**-33%**
Intermediate / Seniors	BTE	48.13	6.55	0.14	34%
	MEG	41.49	5.24	0.13	-1%
	COS	24.24	3.75	0.15	-2%
	CVE	33.45	2.69	0.08	-3%
	HSE	25.94	1.68	0.06	18%
	IMO	43.40	3.64	0.08	-2%
	CNQ	36.19	5.59	0.15	-12%
	SU	34.16	4.42	0.13	6%
	Mean			**0.12**	**5%**

Table 5: Share Trading Summary Post Policy Announcement[+,++] December 7, 2012: March 7, 2014

	Trading Symbol	Mean Share Price - $/share	Standard Deviation	Coefficient of Variation	Return
Juniors	SWE	0.50	0.20	0.39	-62%
	AOS	0.09	0.04	0.48	71%
	PBG	0.56	0.22	0.39	-56%
	IE	1.22	0.65	0.54	-64%
	CLL	0.17	0.05	0.30	-23%
	STP	0.59	0.34	0.58	-86%
	SUO	0.26	0.06	0.23	-46%
	PXX	2.27	0.41	0.18	-15%
	ATH	7.91	1.49	0.19	-17%
	Mean			**0.36**	**-33%**
Intermediate / Seniors	BTE	41.85	2.06	0.05	-5%
	MEG	31.91	2.27	0.07	-3%
	COS	20.34	0.58	0.03	8%
	CVE	30.90	1.41	0.05	-12%
	HSE	30.32	1.63	0.05	19%
	IMO	43.64	2.55	0.06	19%
	CNQ	32.51	2.86	0.09	49%
	SU	34.05	2.69	0.08	15%
	Mean			**0.06**	**11%**

+ Source: Bloomberg, CanOils, company reports.
++ All share prices are in Canadian dollars.

In the empirical analysis we will control for other factors potentially affecting the stock returns of firms operating in the oil sands. Following the standard market model approach we will want to control for the overall performance of the market, the risk free rate of return, and oil prices. We will use the New York Stock Exchange (NYSE) index is the proxy chosen for the market. The NYSE has the advantage over the Toronto Stock Exchange (TSX) of additional diversification outside of energy, along with cross-listings of Canadian firms. For oil prices, two crude streams are incorporated into the analysis: 1) Western Canadian Select (WCS) spot price: the benchmark heavy Canadian blend and most representative of the heavy oil price received by oil sands producers. 2) West Texas Intermediate (WTI): the benchmark light sweet North American crude price. Tables 6 and 7 summarize the returns on oil prices (WCS and WTI) and benchmark share indices (TSX and NYSE) pre and post the SOE investment policy change. This provides some context for other economic factors influencing returns in the periods considered. Both commodity prices and equity indices strengthened significantly following the policy change. In light of this

generally more supportive economic environment, the continued deterioration in the junior sector revealed in Table 4 is striking. This provides prima facie evidence that the change in SOE investment policy may have disproportionately impacted the junior oil sands group.

Table 6: Commodities[+] and Equity Indices[++]
Pre Policy Change
July 28, 2010: December 7, 2012

	Mean	Standard Deviation	Coefficient of Variation	Return
WCS	73.36	9.89	0.13	-14%
WTI	92.14	8.03	0.09	7%
NYSE	7,811.36	337.36	0.04	13%
TSE	12,527.68	751.02	0.06	4%

Table 7: Commodities+ and Equity Indices[++]
Post Policy Change
December 7, 2012: March 7, 2014

|	Mean	Standard Deviation	Coefficient of Variation	Return
WCS	75.98	10.97	0.14	58%
WTI	101.32	8.03	0.08	33%
NYSE	9,872.04	855.33	0.09	42%
TSE	12,894.67	552.73	0.04	18%

+ WCS and WTI are expressed in Canadian dollars per barrel.
++ The NYSE and TSX equity index are expressed in Canadian dollars.

These same patterns can be seen visually by inspecting Figures 3 & 4, where equity indices, commodity and oil sands share prices are indexed to 100 at the time of the revised SOE policy guidelines. The senior/intermediate sector appears to have benefited from a more supportive economic environment, while the junior sector has continued to demonstrate declining share price returns. In Figure 3, the black line reveals the continued, and steeper decline in share prices of an index of the junior oils sands firms post-announcement even as oil prices increase. The index of the share prices of intermediate/senior oil sands firms increases post-announcement. It looks like the share prices of the juniors and intermediates move together and reflect movements in the oil price prior to the announcement. Post-announcement, there is a break in the share prices of the junior index.

Figure 4 plots the index of the share prices of the juniors and intermediate/seniors against the market returns. Again, we see that prior to the announcement the junior share index was strong up to mid-2012 and then experienced a correction from over 140 to 100. The share price index was fairly stable until after December 2012 when the share index declined to below 50 – representing a 50% decline in the index. Meanwhile, the oil sands intermediate/seniors continued to perform better than the juniors and so did the market reflected by the NYSE and the TSX.

Figure 3: Oil Sands Share Price+ versus Oil Price Return
Indexed to 100 at Policy Announcement
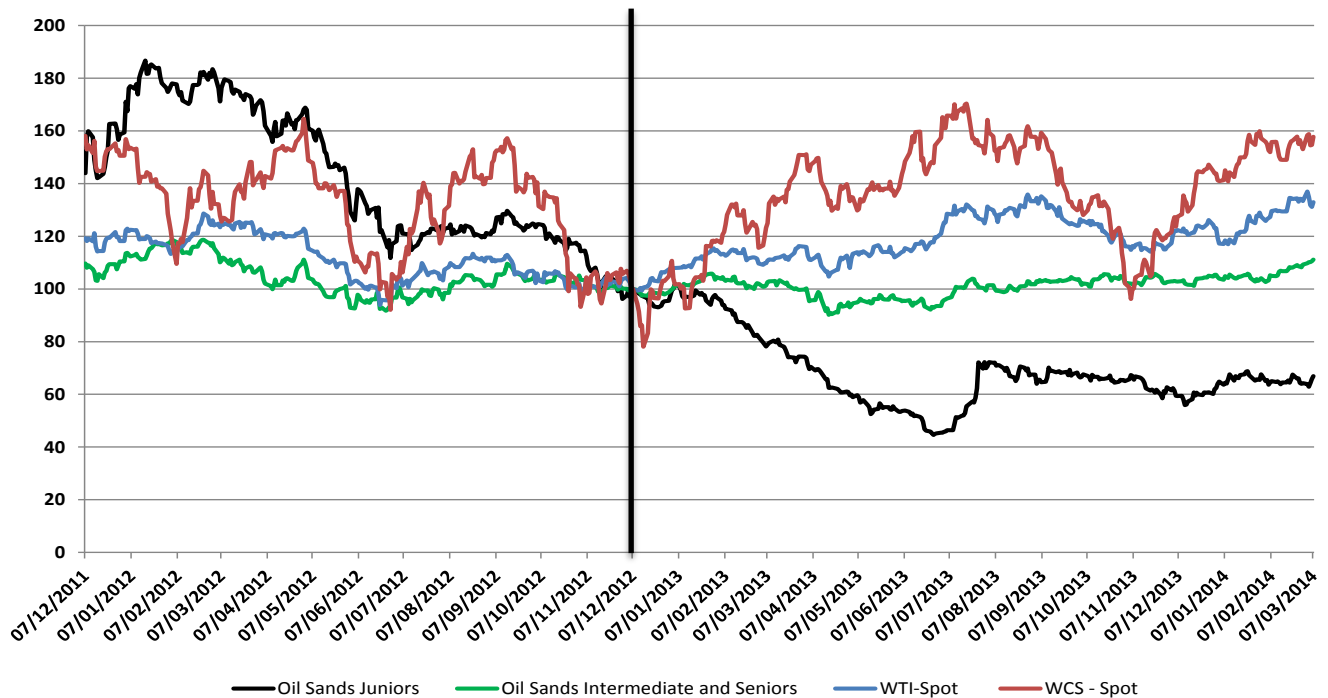
+ Oil Sands returns are equally weighted

The patterns in these share indices revealed in Tables 4 and 5 and Figures 2 and 3 reveal that share prices of the junior oil sands firms declined dramatically in the first half of 2013, and that the intermediate/senior oil sands firms did not do as badly – but did not increase in step with the oil prices, or with the general market conditions. In the next section we use regression analysis to control for the general market conditions and oil prices and we adopt an event study approach to explore the impact of the policy change on the stock market returns of the publicly trade oil sands firms.

**Figure 4: Oil Sands Share Price+ versus Equity Index Return
Indexed to 100 at Policy Announcement**
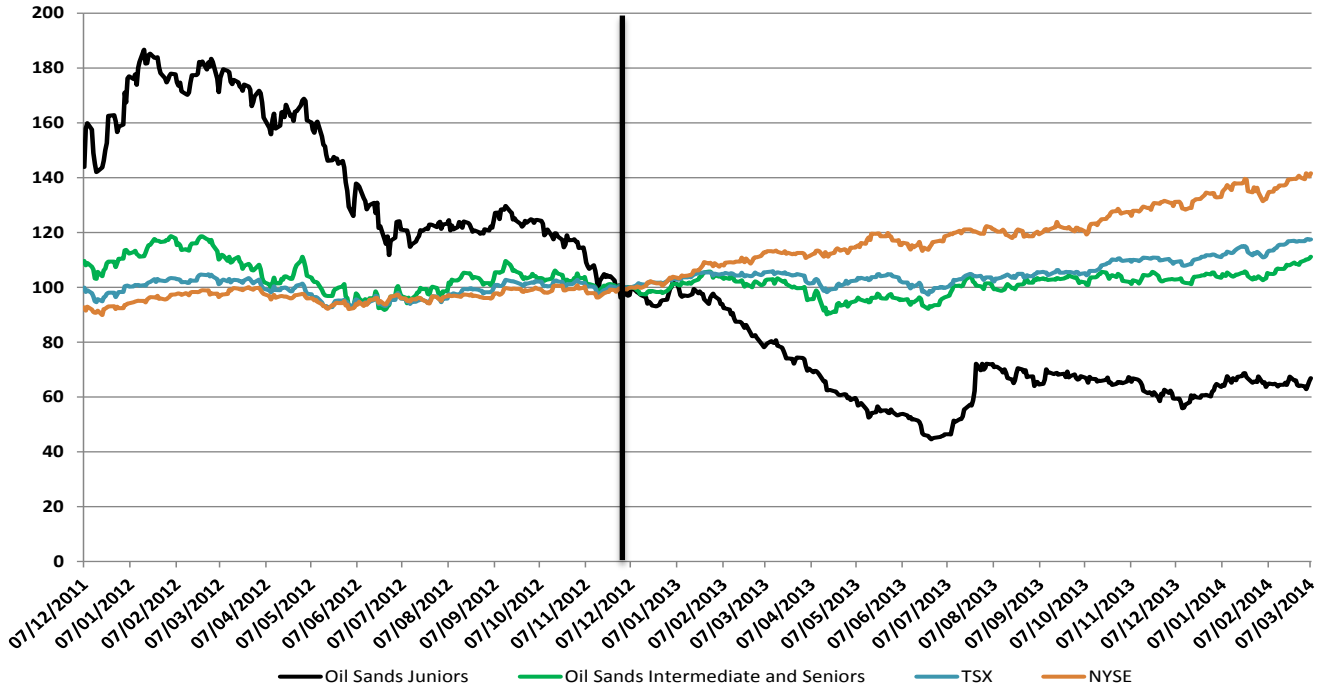
+ Oil Sands returns are equally weighted.

4. The Model and Econometric Methodology

We examine the data in two ways. First, we follow the standard event study literature and compute abnormal returns using the index of junior returns and the index of intermediate/senior returns described in the previous section. Second, we examine the stock returns for each firm individually and use a panel regression to estimate the impact of the policy change. For the first approach we estimate the following market model:

1. $R_{Junior\ Index\ t} = -0.002 + 0.906\ x\ RM_t + 0.275\ x\ Roil_t$
    (s.e.)   (0.0008)   (0.0829)   (0.0489)

2. $R_{Intermediate/Senior\ Index\ t} = -0.0003 + 0.790\ x\ RM_t + 0.369\ x\ Roil_t$
    (s.e.)   (0.0004)   (0.044)   0.0259

3. $R_{All\ Firms\ Index\ t} = -0.0012 + 0.845\ x\ RM_t + 0.313\ x\ Roil_t$
   (s.e.)   (0.0006)   (0.058)   (0.034)

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where R_t is the rate of return on the index of the daily share prices; RM_t is the rate of return on the market (NYSE); and $Roil_t$ is the change in the oil price (WTI). We estimated this equation separately for the junior index and the intermediate/senior index using daily data from July 28, 2010 to December 7, 2012. Then we used the parameter estimates from the regressions to calculate the abnormal return and cumulative abnormal return (CAR) for each index.

$$4. \quad AR_t = R_t - (\hat{\alpha} + \widehat{\beta_1} RM_t + \widehat{\beta_3} Roil_t)$$

$$5. \quad CAR_{(t1,t2)} = \sum AR_t$$

where $\hat{\alpha}, \widehat{\beta_1}$, and $\widehat{\beta_2}$ are the estimated parameters from estimating equations 1-3. We compute the abnormal returns separately for the juniors, the intermediate/seniors and all firms for the post-announcement period and compute the cumulative rate of return. We present the cumulative abnormal return graphically in Figure 5.

Figure 5: Cumulative Abnormal Returns Post Policy Announcement
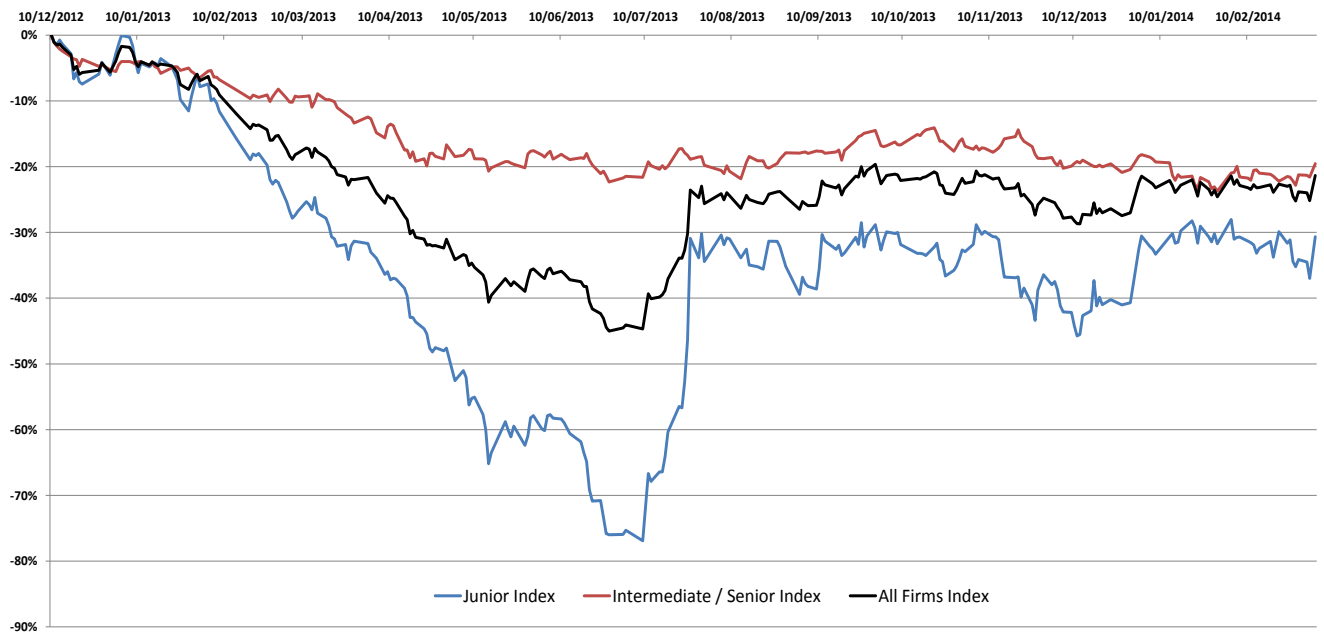
The aggregation of abnormal returns, summarized by the cumulative abnormal return over time, indicates that the policy change had a negative impact on oil sands share returns. In addition,

Figure 5 demonstrates that the juniors were more severely impacted by the SOE policy change than the intermediate and senior oil sands group.

Over the month of July, 2013, the junior index posted positive, and not negative, abnormal returns. This can be seen visually in Figure 5 by a sharp reduction in the negative cumulative abnormal returns. Examining the share trading data, we have determined that this can be attributed to the equally weighted junior index significantly appreciating due to two large day-over-day company share returns in the sample: 1) Alberta Oil Sands (AOS) increased by 108% between July 25 and July 26 (directly as a result of the cancelation of its Clearwater oil sands leases and the associated expected compensation from the Alberta government); and 2) Connacher Oil and Gas (CLL) increased by 171% over the July 16 to July 19 period (the reason is not clear but the share appreciation coincided with a sharp increase in CLL's trading volume). To the extent that these idiosyncratic firm effects are present, the standard event study approach may not adequately reflect the impact of the policy announcement. This may positively or negatively bias the magnitude of abnormal returns. . We address this concern in what follows, where we employ a fixed effects panel regression to account for firm-level effects to better isolate the impact of the policy change on oil sands share returns.

Our second approach is similar to the event study approach initially proposed by Izan (1978), we parameterize the abnormal return attributable to the SOE policy change directly in the regression equation using a dummy variable. That is, we define a dummy variable to equal 0 prior to the policy change and 1 after the policy change in December 2012. The first model we estimate is based on rates of return:

$$6. \quad R_{it} = \beta_1 + \gamma ICA_t + \beta_2 RM_t + \beta_3 Roil_t + \alpha_i + \varepsilon_{it}$$

In this specification, R_{it} is the return on firm shares ($R_{it} = (log(\text{Share}_{it}) - log(\text{Share}_{it-1}))$; RM_{it} is the return on market index; $Oilprice_t$ is the oil price. We construct a categorical variable (ICA$_t$) that equals 0 for all months prior to December 2012 and 1 for all months from December 2012 onward (the policy was announced on December 10, 2012). In some specifications of this model we also include risk free rates (US treasury bill rates), and the Canada-US exchange rate. The α_i is the firm fixed effect and ε_{it} is the error term. We are primarily interested in the γ coefficient on the policy dummy variable that measures the impact of the announced policy change on the shares, or returns of firms operating in the oil sands.

The results from estimating equation 1 are report in Table 7. The first three columns of Table 7 report three different specifications of the model for all firms; then the same specifications are estimated separately for just the junior firms, and then just the intermediate firms (as identified in the previous section). Specifications 1 and 2 are the simplest models and include the policy dummy variable (ICA), the market return (NYSE), and the oil price (WTI or WCS). Model 3 also includes the US treasury bill rate and the Canada-US exchange rate. The coefficient on the policy variable is always negative and always statistically significant. This is evidence that after controlling for other factors and firm specific fixed effects, the impact of the policy change on stock returns is negative.

Table 7: Regression results from Equation 1

	All oil sands firms			Juniors			Intermediate/seniors		
	1	2	3	4	5	6	7	8	9
ICA	-0.033	-0.035	-0.041	-0.05	-0.05	-0.068	-0.018	-0.02	-0.015
	(-3.50)**	(-3.57)**	(-3.42)**	(-2.65)**	(-2.63)**	(-2.94)**	(-3.70)**	(-3.88)**	(-2.32)*
NYSE	1.252	1.502	1.229	1.551	1.839	1.467	0.975	1.188	1.016
	(6.31)**	(7.92)**	(6.13)**	(3.98)**	(4.93)**	(3.78)**	(9.54)**	(11.78)**	(9.45)**
WTI	0.372		0.288	0.421		0.481	0.328		0.098
	(4.22)**		(4.80)**	(2.45)*		(4.20)**	(7.16)**		(3.00)**
WCS		0.072			0.058			0.087	
		(1.88)			(0.77)			(4.20)**	
US tbill			0.357			0.609			0.108
			(2.82)**			(2.49)*			(1.59)
Exchange rate			-0.955			-1.134			-0.84
			(-2.47)*			(-1.53)			(-3.99)**
Constant	-0.019	-0.018	-1.343	-0.032	-0.032	-2.247	-0.004	-0.004	-0.453
	(-3.35)**	(-3.29)**	(-4.89)**	(-2.90)**	(-2.89)**	(-4.28)**	(-1.56)	(-1.37)	(-3.04)**
R^2	0.11	0.09	0.14	0.09	0.07	0.14	0.39	0.33	0.36
N	699	699	699	347	347	347	352	352	352

t-statistics are in parenthesis; * $p<0.05$; ** $p<0.01$

The policy coefficient, γ, can be interpreted as the average monthly abnormal return attributed to the policy change, after controlling for other factors influencing returns. The monthly abnormal returns can be aggregated to arrive at a measure of the cumulative impact on share returns due to the policy change: the Cumulative Abnormal Return (CAR). Over the 15 months post the policy change, Table 7 gives a low CAR of -49.5% (-3.3% x 15) and high CAR of -61.5% (4.1% x 15). The impact of the policy change estimated from equation 6 is similar in magnitude to the CAR calculated from estimating the abnormal returns.

The coefficient on the market return (NYSE) is positive indicating a positive relationship between the overall market and the stock returns of firms in the oil sands. The coefficient is also

greater than one in all cases, indicating oil sands firms are riskier than the market. Not surprisingly, the market return coefficient is larger for the juniors than the larger oil sands firms. We measured oil prices using both the WTI and the WCS. As we see in columns 1 and 2, the coefficient on the WTI price is positive and statistically significant indicating the positive relationship between oil prices and the share values. The WCS price is not statistically significant. The US treasury bill rate is positive and statistically significant and the exchange rate is negative and statistically significant.

We are also interested in finding out whether junior oil companies were affected differently from other oil companies. In columns 4-6 in Table 7 we present the results from estimating equation 1 separately for junior oil companies. The results are generally consistent with the first three columns in that on the policy variable is negative and statistically significant for each group of firms. However, as expected, the magnitude of the coefficient is much larger for junior oil sands companies than it is for medium sized and major oil companies.

5. Concluding Remarks

Using an event study framework, this paper examines the impact of the Federal government's policy change towards acquisitions by State-owned Enterprises (SOEs) on oil sands share returns. Based on the fixed effects regression results, we find that we can attribute negative returns of 50-62 percent on oil sands firms from the revised policy guidelines. These results are robust when using different models to measure the impact of the policy change. Further, negative returns attributable to the policy change were much more pronounced for the junior oil sands group, compared to the intermediate and senior oil sands. This is consistent with our hypothesis that the junior sector is likely more exposed to financing risk due to the early stage nature of their operations (limited internal cash flow to offset the requirement for external sources of financing).

The results of this paper indicate the Federal government's policy change resulted in the material destruction of shareholder wealth, both directly for those actively investing in the oil sands and indirectly through oil sands investment allocations in pension plans. However, the policy change also has broader implications for the real economy. According to Input-Output

analysis by IHS- CERA[14] the oil sands in 2012 1) accounted for 5% of Canadian GDP; 2) contributed $28 billion in government revenue (more than half of which went to the Federal government), and 3) accounted for 3% of all jobs in Canada. This puts the economic contribution of the oil sands on par with the province of Saskatchewan[15] (Canada's fifth largest provincial economy). Failure to advance oil sands projects, due to eliminating access to a large pool of capital, clearly puts employment and social programs at risk. This is the reality of Canada being a small open economy with a capital-intensive resource sector. The welfare implications for Canadians of a policy that, to date, has contributed to a less healthy oil sands sector needs to be carefully considered by policy makers.

Given the results from our analysis of this natural experiment, we hope that we have shed some light on the implications of the current policy—contributing to a lively, and hopefully more informed, policy debate that is currently underway.

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[14] IHS CERA (2014) Special Report. "Oil Sands Economic Benefits: Today and in the Future."

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Trading Symbol	**Appendix**
ATH	**Athabasca Oil Corp** develops oil sands in Alberta, Canada. The Company has working interests in the Athabasca region of northern Alberta.
AOS	**Alberta Oilsands Inc.** is a junior oilsands exploration company focused in the Athabasca oilsands region in Northeast Alberta.
BTE	**Baytex Energy Corporation** explores for and produces oil and natural gas. The Company operates in the Western Canadian Sedimentary Basin and in the United States.
CLL	**Connacher Oil and Gas Limited** develops, produces and markets bitumen resources. The Company's principal asset is in the Great Divide oil sands project located in northern Alberta.
CNQ	**Canadian Natural Resources Ltd.** acquires, explores for, develops, and produces natural gas, crude oil, and related products. The Company operates in the Canadian provinces of Alberta, northeastern British Columbia and Saskatchewan. Canadian Natural also operates in areas which have access for exploration activities and where pipeline systems already exist.
COS	**Canadian Oil Sands Ltd.** is an oil and and gas exploration and production company. The Company is focused on the Syncrude Project, and runs the day-to-day operations involving mining and upgrading bitumen from the Athabasca oil sands.
CVE	**Cenovus Energy Inc.** is an integrated oil company. The Company comprises natural gas, crude oil, and natural gas liquids reserves. Cenovus Energy has established natural gas and crude oil production in Alberta and Saskatchewan as well as refineries in Illinois and Texas.
HSE	**Husky Energy Inc.** is involved in the exploration, development, and production of crude oil and natural gas in Canada and in international areas. The Company also conducts upgrading operations, pipeline operations, commodity trading, and energy infrastructure projects. In addition, Husky manufactures and markets refined products and operates a retail network.
IE	**Ivanhoe Energy, Inc.** is an independent, international heavy-oil development and production company. The Company pursues long-term growth in its reserves and production using advanced technologies including its proprietary, patented heavy-oil upgrading process (HTL). Core operations are in Canada, Ecuador and Mongolia, with business development opportunities worldwide.
IMO	**Imperial Oil Ltd.** produces and refines natural gas and petroleum products and manufactures petrochemicals. The Company's oil and gas operations are concentrated in Canada.
MEG	**MEG Energy Corporation** is an oil and gas corporation. The Company is involved in oil sands development and owns oil sand leases. MEG Energy is located in Calgary, Canada.
PBG	**Petrobank Energy and Resources Ltd.** explores for and develops oil and natural gas in Alberta, Canada.
PXX	**BlackPearl Resources Inc.** is an oil and gas exploration and development company. The Company's focus is heavy oil and oil sands assets located in western Canada.
STP	**Southern Pacific Resource Corp** is a junior oil and gas exploration company.
SU	**Suncor Energy, Inc.** is a integrated energy company focused on developing the Athabasca oil sands basin. The Company extracts and upgrades oil sands into refinery feedstock and diesel fuel, explores for, develops and produces natural gas, refines crude oil and markets a range of petroleum and petrochemical products, and operates crude oil pipelines and retail petroleum stations.
SUO	**Sunshine Oilsands Ltd.** explores for oil. The Company operates on the West Ellis, Thickwood, Legend Lake, Muskwa and Harper properties in the Athabasca oil sands region in Canada.
SWE	**SilverWillow Energy Corporation** is a Calgary, Alberta based pre-production oil sands company with a portfolio of exploration leases in Canada's Athabasca oil sands. The Company seeks to move its oil sands properties toward commercial production.