Did Canada Survive the Financial Crisis Better than the United States?

Ashrafee T. Hossain
Memorial University of Newfoundland

Dao Xuan Nguyen
Memorial University of Newfoundland

This paper compares and contrasts the influence of leverage on firm performance between the United States and Canada. By analyzing 10 largest oil & gas companies each from Canada and the US, we find that leverage has a negative impact on firm performance for both these countries. Moreover, we find strong evidence that the performance gap between high and low leverage firms is lower in Canada, and the results are prominent during the financial crisis of the last decade.

INTRODUCTION

The United States and Canada enjoy world's largest trading relationship. They are natural trading partners in many major industries, such as automobile, machinery, aerospace product and parts, and energy etc. This relationship is accommodated by similar characteristics shared by the two countries, including the culture, language, and standards of living. In addition to those elements, the economies of U.S. and Canada are both highly developed and have similar GDP structures. However, these two economies are also very different in terms of market size, governmental regulation and involvement (Fergusson, 2011), and consumer behavior (TD Economics, 2013). In fact, the Canadian economy appears to have been more stable during historical financial crises, including the 2008 economic recession (Haltom, 2013).

In this paper, we investigate how these differences in economic performance have been presented at the industry level. There are two rationales based on which we establish our interests for this paper. First, the 2008 financial crisis has affected many U.S. and Canadian exporters, especially those in the energy sector (Bank of Canada, 2014). Given that the oil and gas is an important industry for both economies, especially in the context of the increasing dependence of Canadian economies on oil prices, it is compelling to examine how oil and gas firms in these two countries reacted during the crisis. Second, we choose to examine the relationship between capital structure and firm performance, because capital structure can incorporate general market factors, including interest rates and changes in the economy, which would provide a better understanding of how firm performance is impacted against changes in the economy.

"Capital structure" is an important concept of corporate finance, which refers to the way a company finances its assets through the combination of debt and equity (Mujahid and Akhtar, 2014). The original theory of capital structure was introduced in 1958 by Modigliani and Miller (M&M). According to the M&M theory, in perfect markets, a firm' market value is independent of its capital structure choices and

dividend policies. Based on this fundamental theory, following research has accounted for other market imperfections, such as transaction costs, agency costs and bankruptcy costs, in order to better describe their impacts on capital structure (Mujahid and Sorin, 2009).

The relationship between firm capital structure and performance has been investigated in numerous research reports in both financial and non-financial sectors. In general, much research discovers a negative relationship between firm performance and leverage (Banerjee and De, (2014), Saeedi and Mahmoodi (2011), and Ebrati et al. (2013)). However, Saeedi and Mahmoodi (2011) find no significant relationship while Gabrijelcic et al. (2014) identify a positive relation between return-on-equity and leverage ratio.

With respects to the comparison between the U.S. and Canadian markets, some reports have been introduced. For instance, to identify some similarities and differences between the U.S and Canada, Fergusson (2011) looks into the trading relationship between the two countries, Haltom (2013) analyzes the Canadian financial market's special features, Lane (2014) accesses the conditions of the two countries after the crisis (Bank of Canada, 2014), and Bordo et al. (2011) examines how Canada was able to avoid historical financial crises. There have also been organizational reports that contrast the consumer behaviors of the two economies (TD Economics, 2013). Overall, most research has found that the Canadian economy is less affected by the financial crisis, partially thanks to its special banking system (Haltom (2013) and Bordo et al. (2011)).

While there are numerous reports discussing the differences between the U.S. and Canadian market, there is still limited research that compares the impacts of capital structure on firm performance, especially from the perspective of oil and gas industry. Furthermore, while most research looks into the relationship between capital structure and firm performance through a long timeframe, there is little consideration for how this relationship changes in each stage of the financial crisis. Therefore, in addition to examining the aforementioned impact, this paper also looks at how it varies in different stages around the financial crisis.

In order to understand and compare the difference between the U.S. and Canada regarding the relationship between firm leverage and performance, we have developed three hypotheses to test our proposals. These hypotheses will be discussed in the following section. Overall, the results suggest that there is a negative relationship between capital structure and firm performance. However, with respects to profitability indicators, Canadian firms outperform their U.S. counterparts during financial crisis. Notably, the performance gap between low and high leveraged Canadian firms is much lower than that of their US counterparts.

HYPOTHESIS DEVELOPMENT

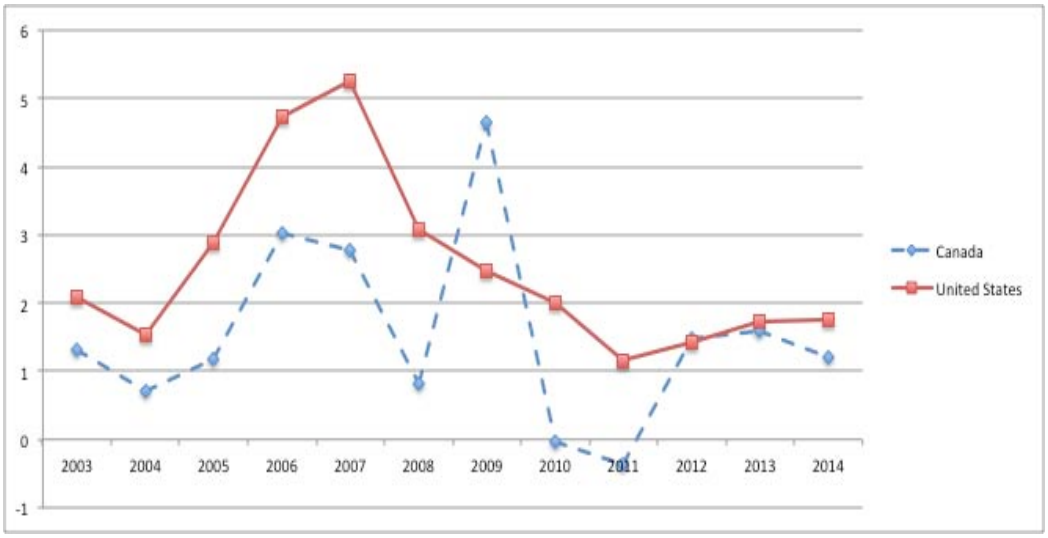
In order to establish the hypotheses to assess the relationship between capital structure and firm performance, we use the agency cost theory proposed by Jensen and Meckling (1976). The theory states that the conflict of interests between the principal (i.e. shareholders) and the agency (i.e. managers) usually leads to agency costs, which are incentives that shareholders have to provide to managers so that managers will act in the best interests of shareholders and the firm (Jensen and Meckling, 1976). Another source of agency costs is the conflict between debts owners and shareholders. This type of agency cost arises due to information asymmetry, where the management generally has more internal information than shareholders, debt holders and other parties. This encourages the debt owners to implement protective methods for their loans, including increasing interest rates and using stricter covenants. When the information asymmetry increases, so do the default risks and agency costs (Jensen and Meckling, 1976).

In general, leverage and agency costs can either deteriorate or improve firm performance. On one hand, increasing leverage encourages management to engage in riskier projects at the expense of debt holders. However, such strategy may lead to higher interests and default risks, which are detrimental to firm performance. Thus, there is a negative relationship between higher leverage and firm performance (Soumadi and Hayajneh, 2012). On the other hand, more leverage also increases bankruptcy risks. Therefore, it incites the management to focus on performance to avoid these costs. Furthermore, if the

management has shares in the firm, they would also want to protect their own interests, resulting in their efforts to maintain firm performance (Soumadi and Hayajneh, 2012).

Considering specific characteristics of the oil and gas industry, the negative impact may outweigh the positive impact. Firstly, because the nature of the industry is capital intensive and highly unpredictable, firms usually require large capital investments (Committee on Price Research, 1939). Secondly, on average, both U.S. and Canadian interest rates have been stably low, except for the crisis period from 2006 to 2009 (see Figure 1). This in turn has reduced related default risks for firms.

FIGURE 1
CANADIAN V. US REAL INTEREST RATES



Source: World Bank

Thirdly, historically larger oil and gas firms have shown much higher stability and survival rates (Mansell et al., 2012). Overall, all these conditions would likely encourage firms to engage in riskier projects, and thus are prone to more negative consequences.

Considering the difference between U.S. and Canadian firms, we anticipate that before the crisis, there would be a similarity between the two countries, where leverage would negatively impact firm performance. However, it is to be noted that the US economy was hit really hard by the crisis and investor confidence was really low during and immediately after the crisis; the whole world was suffering from the rippling effect but none like the US. We therefore anticipate that highly levered US firms will be impacted with strong negative performance during the crisis, and with the same logic the gap between the performances of low and high levered firms would have widened during that period. We do not expect the same extreme impacts for our Canadian firms. As a result, the gap between so called good (low leverage) and bad (high leverage) firms' performances should be higher in the United States during the crisis. In a mean reversion argument, the US firms should be rebounding more than the Canadian firms as they went more hit harder than the Canadian firms; therefore, in the post-crisis recovery period US firms will show better results than their Canadian counterparts, and with the same argument, the gap between good and bad in the US should then be lower than that of Canada.

Based on the above analysis, the following hypotheses are proposed:

> *H_1: Before the financial crisis, we do not anticipate any difference regarding the impact of leverage on firm performance between U.S. and Canadian firms.*

H_2: During the financial crisis (2007-2009), we expect US firms to show a higher impact of leverage on performance, and as a result we also expect the gap between high and low leverage US firms' performance to be wider than that of their Canadian counterparts.

H_3: During the post-crisis recovery period (2010-2013), we anticipate that US firms will be recovering at a faster pace and therefore the gap mentioned in H_2 should be lower for US firms than their Canadian counterparts.

DATA AND SAMPLE

Data for this research is secondary data, which is collected from financial statements of twenty oil and gas companies, ten each from the U.S. and Canada. The sample companies are those who have the largest market capitalization. The timeframe for the research is from 2004 to 2013, broken down in to pre-crisis (2004 – 2006), during crisis (2007 – 2009), and post-crisis recovery period (2010 – 2013). The detailed list of the twenty companies is provided in the Appendix.

In table 1, descriptive statistics of data are listed. The table provides calculations for independent variables, which are average value, in million US Dollars, of cash, fixed assets, current assets, total assets, total debts, current liabilities, and shareholders' equity. Descriptive statistics also show fixed-asset ratio, current ratio, cash ratio, and earning per share. The ten-year data is considered to consist of three different periods: pre crisis, during crisis, and post crisis. Panel A and B provide data for U.S. and Canadian firms, respectively.

According to the descriptive statistics, U.S. firms are generally larger than Canadian firms. In addition, for U.S. firms, the amount of assets and dependence on leverage are also inversely related. In fact, most accounting measures are higher for firms having lower leverage ratio. Canadian firms, on the contrary, do not demonstrate a very clear distinction. For instance, average total asset of high-leveraged firms is higher than that of low-leveraged firms by only 4%. While the total debt number is quite close between high (10.5 billion) and low leverage (8.1 billion) US firms; it is strikingly different for the Canadian sample (high leverage firms have average debt of 10.3 billion whereas low leverage firms have average debt of just 3.4 billion).

Interestingly, while U.S. firms are much larger in size, they do not heavily rely on debts. For example, the average debt ratio for US firms is 10.84% while it is 25.44% for the Canadian firms. In fact, U.S. firms seem to finance their assets by equity capital, as their average shareholder's equity is also 2.5 times higher compared to Canadian firms. Regarding other descriptive ratios, U.S. firms maintain more current assets, such as cash and current assets, while Canadian firms keep more long-term assets, including fixed assets. U.S. firms also have better liquidity, shown by higher current ratio, and much higher EPS performance.

Table 2 depicts the level of leverage for the ten-year period, broken down in annual and crisis-period term. As can be seen from this table, the level of leverage conforms to results in the descriptive statistics, in which Canadian firms tend to have more leverage than U.S. firms. For instance, before and after the crisis, high-leveraged Canadian firms maintain almost equal amount of debts and equity, with a D/E ratio of 1.15 before the crisis and 1.04 after the crisis. On the contrary, riskier U.S. firms keep leverage ratios of 0.45 and 0.49 before and after the crisis, respectively. Similarly, low-leverage U.S. firms only maintain average D/E ratios of nearly a half of their Canadian counterparts. With respect to the trend in using leverage over the ten-year period, firms in both countries seem to be more conservative after the crisis. For instance, the overall leverage ratios of both the U.S. and Canadian firms drop during the crisis and, after the crisis, bounce back to a level lower than before the crisis.

Due to variances in the use and trend of leverage, the gap of leverage between high and low-leveraged firms is also different in both countries. For instance, the amount of leverage significantly fluctuates for high-leveraged Canadian firms. For these companies, D/E drops by 26% during the crisis and increases by 15% after the crisis. For U.S. firms, these fluctuations are only at 2% and 6% during and after the crisis, respectively. Lower-leveraged firms, nevertheless, show different movements. For the U.S., the

D/E ratio decreases by 6% during and increases by 3% after the crisis. For Canada, the ratio decreases slightly less than the U.S, only by 5%. The leverage ratio remains almost the same after the crisis. As a result, the gap between high D/E and low D/E ratios has gradually increased for U.S. firms, from 27% before, to 31% during, and to 34% after the crisis. The gap for Canadian firms, on the other hand, has been reduced from 84% before the crisis to 63% during the crisis, and increased to 78% after the crisis. This gap is 6% lower than the pre-crisis period.

TABLE 1
DESCRIPTIVE STATISTICS

PANEL A: US SAMPLE

	Hi D/E	Lo D/E	Overall
Cash (millions of USD)	2,001	8,630	5,066
Fixed assets (millions of USD)	35,145	75,148	53,641
Current assets (millions of USD)	9,418	31,573	19,662
Total assets (millions of USD)	55,193	123,308	86,687
Total debts (millions of USD)	10,584	8,082	9,427
Current liabilities (millions of USD)	8,451	23,616	15,463
Shareholders' equity (millions of USD)	24,761	64,873	43,307
Fixed asset/Total assets	0.69	0.65	0.67
Current assets/current liabilities	1.18	1.55	1.35
Cash/Total assets	0.04	0.06	0.05
EPS	3.96	7.39	5.55
No of Observations	100		

PANEL B: CANADIAN SAMPLE

	Hi D/E	Lo D/E	Overall
Cash (millions of CAD)	655	817	734
Fixed assets (millions of CAD)	21,969	21,204	21,598
Current assets (millions of CAD)	3,021	3,901	3,447
Total assets (millions of CAD)	28,858	27,633	28,264
Total debts (millions of CAD)	10,335	3,959	7,246
Current liabilities (millions of CAD)	3,584	3,878	3,726
Shareholders' equity (millions of CAD)	10,718	13,979	12,298
Fixed asset/Total assets	0.75	0.77	0.76
Current assets/current liabilities	0.87	0.91	0.89
Cash/Total assets	0.02	0.03	0.03
EPS	2.07	2.44	2.25
No of Observations	100		

TABLE 2
SUMMARY STATISTIC

PANEL A: U.S. SAMPLE

Year-by-year summary stat

Year	*Hi D/E*	*Low D/E*	*Overall*	*Diff (High-Low)*
2004	0.46	0.25	0.37	0.21
2005	0.32	0.17	0.25	0.15
2006	0.58	0.12	0.37	0.46
2007	0.40	0.10	0.27	0.30
2008	0.42	0.12	0.29	0.30
2009	0.46	0.14	0.32	0.32
2010	0.47	0.16	0.34	0.31
2011	0.50	0.14	0.32	0.37
2012	0.50	0.15	0.33	0.35
2013	0.47	0.15	0.31	0.32

Summary stat by period

Period	*Hi D/E*	*Low D/E*	*Overall*	*Diff*
Pre-crisis (2004-2006)	0.45	0.18	0.33	0.27
During crisis (2007-2009)	0.43	0.12	0.29	0.31
Post crisis (2010-2013)	0.49	0.15	0.32	0.34

PANEL B: CANADIAN SAMPLE

Year-by-year summary stat

Year	*Hi D/E*	*Low D/E*	*Overall*	*Diff (High-Low)*
2004	1.10	0.364	0.77	0.73
2005	1.15	0.350	0.79	0.80
2006	1.21	0.224	0.77	0.98
2007	1.09	0.279	0.69	0.82
2008	0.65	0.260	0.65	0.39
2009	0.93	0.243	0.59	0.69
2010	0.88	0.259	0.57	0.62
2011	1.18	0.271	0.73	0.91
2012	1.04	0.225	0.63	0.81
2013	1.05	0.279	0.67	0.78

Summary stat by period

Period	*Hi D/E*	*Low D/E*	*Overall*	*Diff*
Pre-crisis (2004-2006)	1.15	0.31	0.78	0.84
During crisis (2007-2009)	0.89	0.26	0.64	0.63
Post crisis (2010-2013)	1.04	0.26	0.65	0.78

METHODOLOGY

We test the proposed hypotheses by using financial measures collected from the companies. To demonstrate the financial leverage, we use the leverage ratio, i.e. the Debt-to-equity ratio (D/E). We implement both return on assets (ROA) and return on equity (ROE). The reason for using ROA and ROE for performance measurement is that these parameters reflect the fluctuation of firm profitability according to changes of asset and equity.

DISCUSSION OF RESULTS

Table 3 demonstrates the impact of financial leverage on firm ROA and provides a comparison between U.S. and Canadian firms.

TABLE 3
FIRM PERFORMANCE – RETURN ON ASSETS

	United States			Canada			US - Canada
	Hi	Lo	Diff	Hi	Lo	Diff	Diff-in-Diff
Pre-crisis period: 2004-2006	10.5%***	13.9%***	-3.4%***	6.7%***	11.8%***	-5.1%***	1.70%
Crisis period: 2007-2009	1.3%***	11.9%***	-10.6%***	6.4%***	9.8%***	-3.4%***	-7.2%***
Post-crisis period: 2010-2013	4.0%***	9.5%***	-5.5%***	1.4%***	5.7%***	-4.3%***	-1.2%*

In general, there is a negative relationship between financial performance and D/E ratio, where higher leverage results in lower financial ratios. Consistently we find that lower leverage firms outperform higher leveraged firms, both in Canada and the United States. This is consistent with our expectation. We further note that, during the pre-crisis period that gap between high and low leverage firms in the United States is smaller by 1.7% than their Canadian counterparts; but this result is not statistically significant. We, therefore conclude that in the pre-crisis period there is no significant difference between the way US and Canadian firms behave faced with various degrees of leverage. This is consistent with our first hypothesis.

Secondly, we find that the aforementioned gap is wider for the US firms during the financial crisis. This provides support for our second hypothesis. We find that the gap between high (bad) and low (good) leverage firms' performance is wider by 7.3% for the US sample.

Thirdly, we find that the gap is still wider for the US firms in the post-crisis recovery period. This is contrary to what we hypothesized in H_3. We predicted that mean reversion will take place and US firms will recover at a much faster pace than their Canadian counterpart and therefore, the gap will be narrower. However, the results show that the gap is wider by 1.2% for the US firms. It is to be noted though that this gap is much lower than it used to be during the crisis [7.3% gap during the crisis versus 1.2% gap in the recovery period].

Finally, we would like to point to one more sets of results and those are the performance numbers from the high leveraged (bad) firms from both countries. If we just compare the high levered Canadian and US firms' performances, we will notice that US high levered firms outperform Canadian high levered firms both in pre-crisis (by 3.9%) and post-crisis recovery period (by 2.6%) whereas the Canadian ones outperform their US counterparts by 5.1% during the crisis. This also provides evidence in favor of our

earlier claim that Canada did fare better during the financial crisis and the stronger evidence within the subsample of so-called 'bad' (high leverage) firms speaks volume.

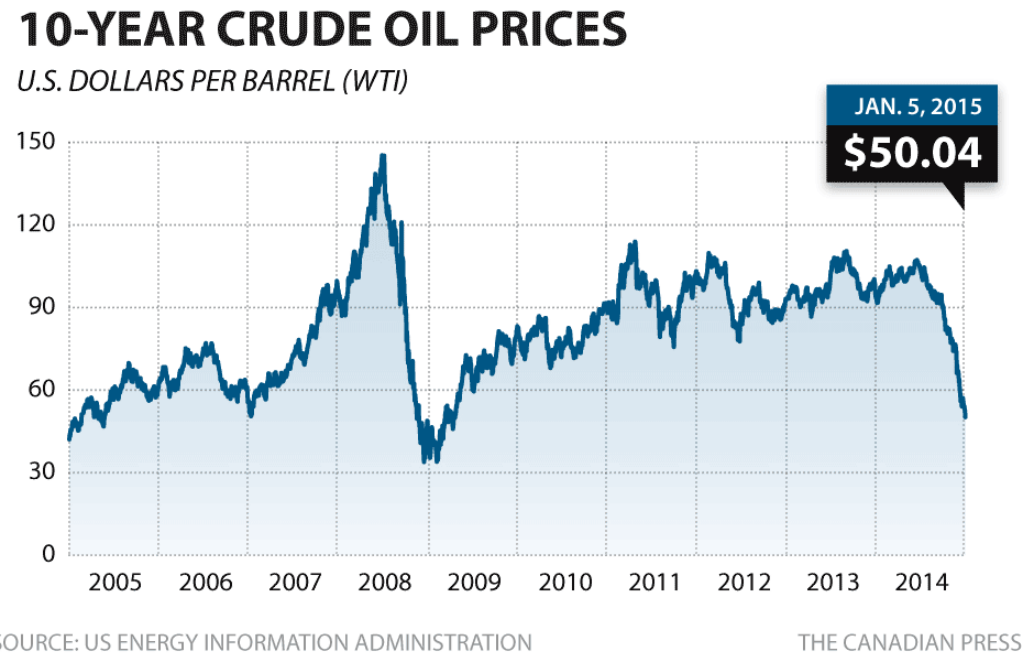
For robustness purpose, we analyzed the ROE results for the entire sample. The methods used were same as the ROA tests. Table 4 compares the impact of financial leverage on ROE:

TABLE 4
FIRM PERFORMANCE – RETURN ON EQUITY

	United States			Canada			US - Canada
	Hi	Lo	Diff	Hi	Lo	Diff	Diff-in-Diff
Pre-crisis period: 2004-2006	22.5%***	26.1%***	-3.6%***	18.6%***	25.1%***	-6.5%***	2.90%
Crisis period: 2007-2009	3.0%***	21.7%***	-18.6%***	16.6%***	19.8%***	-3.3%***	-15.3%***
Post-crisis period: 2010-2013	8.6%***	17.8%***	-9.2%***	4.4%***	11.1%***	-6.7%***	-2.5%*

ROE results show a very similar trend in performance over the economic recession to that of ROA. For instance, the performance gap between high and low leverage firms in the US was narrower by 2.9% in the pre-crisis era; however the result was not statistically significant. This gap was wider by 15.3% for the US sample during the crisis and wider by 2.5% after the crisis—both of these results are statistically significant. In summary, we find evidence to support our hypotheses 1 and 2, but did not find evidence to support hypothesis 3.

FIGURE 2
10-YEAR CRUDE OIL PRICES



There are several causes for the above observations. To explain for the strong negative impact of the capital structure on firm performance during the crisis, interest rate is a probable factor. As can be seen in Figure 1, for both countries, interest rates from 2006 to 2009 are generally more volatile in the other years. For U.S., interest rate is considerably high in three consecutive years 2006, 2007 and 2008; and for Canada, interest rate is high in 2006, 2007 and 2009. Higher interest rates have led to higher costs of capital, affecting firm profitability. However, it should be noted that on average, the rates in Canada are still lower than U.S. In addition, the Canadian rate in 2008 is much lower than that of U.S. This may explain why the performance of U.S firms having high leverage has been critically affected during the crisis, although on average, they still have lower D/E ratios than their Canadian counterparts. However, after the crisis, the use of high leverage of Canadian firms has possibly negatively influenced and resulted in Canadian firms' poorer performances.

In addition to capital structure, the significant drop of oil price in 2008 is also an important factor that severely deteriorates firms' profitability. As can be seen in figure 2, the oil price grew quickly before the crisis and peaked in early 2008, then plunged in 2009. While the oil price has slightly recovered since 2010, the range of the price fluctuation has not been as large as before the crisis. In fact, the fall of the oil price has severely reduced sales and profits of many reporting companies during the recession period. However, as discussed in the literature, because Canadian firms are more resilient and well prepared than U.S. firms, they have been able to avoid the financial crisis better than U.S. firms.

CONCLUSION

We can conclude from the findings of our paper that financial leverage has a negative influence on firm performance. Additionally, our findings illustrate the difference between U.S. and Canadian firms regarding the level of performance sensitivity against the financial leverage. In addition to capital structure, such sensitivity is, nevertheless, also affected by other market factors, including the oil price and other fiscal and monetary policies. Finally, the scope of this study is only limited to companies with the large cap oil & gas firms, and therefore, may not be generalized across all industries. However, this could be a stepping stone for further research studies in future exploring other industries and other countries as both practitioners and academicians are interested to gather knowledge about the ways the recent financial crisis impacted different facets of corporate world.

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APPENDIX

List of U.S. Companies

Proposed U.S. companies based on market capitalization (Statista, 2015) are:

1. Exxon Mobil
2. Chevron
3. ConocoPhillips
4. Occidental Petroleum
5. Eog Resources
6. Phillips 66
7. Anadarko Petroleum
8. Apache
9. Valero Energy
10. Devon Energy

List of Canadian Companies

Proposed Canadian companies based on market capitalization (Globe and Mail, 2013) are:

1. Suncor
2. Canadian Natural Resources
3. Imperial Oil
4. Enbridge
5. TransCanada Corp
6. Husky Energy
7. Cenovus Energy
8. Encana
9. Crescent Point Energy
10. Talisman Energy

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