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Department of Economics

The Cost of Transparency

– Stock market reactions to the introduction of the
Extractive Sector Transparency Measures Act

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Abstract

This paper examines stock market reactions of affected firms to the introduction of the Extractive Sector Transparency Measures Act, ESTMA. Using publicly available stock return data on Canadian listed mining firms and oil and gas producers an event study is employed to assess how the stock market reacted to the key events in leading up to the enactment of the Act. ESTMA mandates extractive firms listed on Canadian stock exchange to disclose payments made to governments regarding exploration of oil, natural gas, and minerals. The evidence suggests no systematic negative impact on affected firms' stock returns surrounding the analysed events.

Keywords: Financial transparency, Mandatory disclosure requirements, Extractive Sector Transparency Measures Act

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1 Introduction

Corruption is one of today's greatest obstacles to economic development. It slows economic growth and undermines the rule of law around the world. The cost of corruption worldwide is estimated to be more than five percent of global GDP and bribes alone constitutes over two percent of global GDP (International Chamber of Commerce et al., 2008; World Bank, 2017). As a response to this development a range of regulatory measures is available where in recent years transparency-based legislation focusing on disclosure requirements has been increasingly introduced. Since the start of this millennia, this kind of legislation in this specific area has been introduced in a number of countries. It started with the section 1502 and 1504 of the Dodd-Frank Act in the United States in 2010 which was followed up by the Extractive Industries Transparency Initiative, EITI, which is the most comprehensive initiative intended to combat corruption in the extractive industries. It was adopted by the European Parliament in October 2013. More recently Canada has also introduced its own version of anti-corruption legislation through mandatory disclosure requirements for the extractive sector.

As the effects of disclosure requirements in general have been given little attention and mandatory disclosure requirements to specifically combat corruption and bribery is an even more novel concept the effects of this kind of legislation on the affected firms have not yet been given equal attention as the problem of corruption itself. However, along with a growing literature in this field at least one relevant effort has been made addressing the effects of this kind of legislation in the extractive sector specifically where Johannesen and Larsen (2016) find that transparency-based legislation through mandatory disclosure requirements has negative effects on the firm value of firms participating in the EITI.

Although legislation of this form aims at increasing transparency there are potential negative outcomes to deal with if policies and regulation are not carefully prepared to address all aspects. Berns (2011) emphasize that as international stock markets are getting more efficient the process of delisting involves less inconvenience and argues that the introduction of the disclosure requirements of the Dodd-Frank Act could result in US firms delisting as a result of increased cost related to the legislation, consisting of both compliance cost and public relations costs. Stemming from having to disclose payments made to foreign governments. Berns (2011) exemplifies this by noting a number of delistings around the time of the introduction of the

legislation. Although the evidence presented by Berns (2011) is anecdotal, the prediction is realised in a similar setting as Engel et al. (2006) empirically shows that mandatory disclosure legislation in the context of the Sarbanes Oxley Act increased the rate of listed firms going private as a measure to avoid costs related to the legislation.

In the area of disclosure requirements in the extractive sector it would be the extreme case of negative outcomes if firms chose to go private as a way of escape the costs associated with mandatory disclosure requirements as it would render the legislations ability to combat corruption rather weak. Similarly, if affected firms are perceived to be negatively affected by this kind of legislation through increased costs they have the option to withdraw from a place of business in a resource-rich country with the potential result of being replaced by another extractive business that obeys under laxer anti-corruption legislation (Sarfaty, 2013). Thus, the effect of the introduced legislation on the implementing country and affected firms are business opportunities forgone. Simultaneously the resource-rich country may experience a decline in economic development as corruption increases.

This study seeks to examine the effects on firm value during the introduction of legislation aimed at increasing transparency and combat corruption through mandatory disclosure requirements for Canadian firms in the extractive sector. Based on a sample of stock returns for 1226 mining companies and 275 oil and gas producers an event study methodology is used to analyse the key regulatory events that led up to the enactment of the Extractive Sector Transparency Measures Act, ESTMA. The analysis is conducted with the aim to answer the following research question: How did the enactment of the Extractive Sector Transparency Measures Act affect the firm value of Canadian listed firms? As previous studies generally do not account for heterogenous effects within the extractive sector a further objective of this paper is to examine if the firm value of oil and gas producers and mining companies are affected differently by the introduction of ESTMA.

Due to the fact that several of the regulatory changes that have been made in this area have been implemented during recent years, the long-term effects are still uncertain. As the regulatory environment differs by countries and geographical areas, the implications of introduced legislation in the US and the global EITI initiative cannot be generalised to other contexts. However, as ESTMA is closely related to the Dodd-Frank Act and the EITI initiative this provides an opportunity to take the first step in the examination of the implications of ESTMA

on affected firms. Thus, this study contributes to the growing body of literature on the effects of policy introduction on firm value by providing the first analysis of mandatory disclosure requirements applied to the Canadian extractive sector. Evidence that does not confirm the findings in the previous literature on disclosure requirements should raise the question of what dissimilarities in policy development different countries could address to collectively minimise the negative outcomes of transparency legislation. Evidence in support for previous findings provokes equally important questions regarding the design of policy targeted at increasing transparency and signals the need for further examination of this specific branch of policy.

This remainder of this paper is structured as follows. Section 1 provides a background to transparency-based legislation and ESTMA in particular followed by an overview of the literature in the field of mandatory disclosure requirements and its effect on firm value. In section 2 the data used, and a detailed description of the event study methodology is presented followed by the empirical results in section 3. In section 4 robustness checks are performed and the results of which are presented. This is followed by a discussion of the results and the limitations to the study. Finally, concluding remarks are presented in section 6.

1.1 Provisions of ESTMA

As Canada is home to over 50 percent of the world's publicly listed mining and exploration firms there is much pressure from the global society on Canada to attend to its responsibility to not only live up to international anti-corruption standards, but also set an example and lead the way (Trade and Development Canada, 2013). Canada also had the advantage of examining the introduction of the Dodd-Frank Act which was implemented in the US in 2010. The Cardin-Lugar amendment of the Dodd-Frank Act includes section 1504 which compel US resource extraction issuers to disclose payments made to the US federal government and/or foreign governments. The ESTMA is closely related to the section 1504 of the Dodd-Frank Act but there are differences in the application of the law to individual firms. While the US version only applies to issuers that are already required to file an annual report in line with compliance with the US Securities Exchange Act the ESTMA is designed to theoretically capture all firms within the extractive industries (SEC, 2015; 2016). Another difference comparing ESTMA to the Dodd-Frank Act is the rule proposing process. In the US the Securities and Exchange Commission was the regulatory body responsible for developing the rules for the proposal of the Cardin Lugar amendment of the Dodd-Frank Act. Whereas in Canada the group of

representatives that developed the rule proposal consisted of both government representatives as well as representatives from the industries and civil society organisations.

The ESTMA defines the entities that have to disclose payments as payees, which is corporations, trusts or unincorporated organisations that engage in the commercial development of oil, gas, and minerals in Canada or somewhere else and are listed on a Canadian stock exchange. The activities for which payments have to be disclosed includes Exploration, extraction, and acquisition or holding of a permit or similar authorisation to perform the extraction of exploration of oil, gas or minerals. The type of payments for these activities includes taxes (other than consumption- and income taxes), production entitlements, bonuses, infrastructure improvement payments and other considerations for licenses, permits or concessions. Finally, the law stipulates that entities have to disclose payments according to these definitions to all levels of government, in Canada or a foreign state, including state-owned enterprises (Extractive Sector Transparency Measures Act, 2014). This has significant implications for the potential success for the legislation to combat corruption since OECD (2014) Foreign Bribery Report reports revealed that officials in state-owned enterprises represent over 80 percent of the recipients of bribes in examined bribery cases. The consequence for firms when failing to comply with the ESTMA requirements and publish a report within 150 days after the end of the fiscal year, or for purposely mislead authorities by publishing a misleading report is an offence punishable with a fine of up to CAD\$ 250000. Furthermore, each day that passes from the submission of the first non-compliant report or from the day when a compliant report should have been submitted is considered a separate offence. Thus, a firm that neglects to properly report or correct a faulty report for a whole year will have to pay a hefty fine (Extractive Sector Transparency Measures Act, 2014).

1.2 Literature review

It is frequently argued that mandatory disclosure requirements can result in efficient securities markets and that it reduces firms' cost of capital. Despite this, full voluntary disclosure by firms is a rare occurrence in reality. The reason is probably the costs associated with disclosing information by firms. Except for the direct costs of paying fines associated with not complying, the most obvious is the cost of producing the appropriate reports to be able to comply with the legislation. Especially since this information often is of such character that before it could be properly disclosed it has to be certified by a third party such as an accounting firm. Admati and

Pfleiderer (2000) explore whether firms at all should disclose information and how much information that should be disclosed and also what this information should consist of to determine the optimal disclosure policy. They proceed by outlining 3 assumptions regarding the disclosure of information by firms. First, it is assumed that firms' values are correlated which implies that disclosed information by one firm will be used by investors to evaluate other firms. Secondly, as mentioned above, it is costly to disclose information and these costs increases as the precision of the disclosed information increases. Thirdly it is assumed that information asymmetries between investors and firms reduce firm value. Conversely, the opposite is also true, decreasing information asymmetries will increase firm value. These assumptions are examined through a model of initially one firm and later on two firms to decide the optimal disclosure policy. It is concluded that there is a potential value in introducing disclosure requirements albeit the specific structure for regulation remains to be examined.

These costs are also analysed by Zhang (2007) in a different context through an event study of the key events leading up to the passage and implementation of the Sarbanes-Oxley Act, SOX in the US in 2002. The purpose of SOX is to introduce greater penalties for managerial misconduct and to prevent deceptive accounting for affected firms. Through the analysis of abnormal returns of US stock indices Zhang (2007) hypothesizes that the costs of the introduction of legislation might outweigh the benefits. By using a method of constructing a control group by estimating an index based on stock returns for firms listed in countries other than in the US it is concluded that the introduction of SOX imposes statistically significant costs on affected firms by decreasing firm value in association with the analysed events. These costs reflect the private costs of complying with the legislation and the expected future cost of regulation to come. A further examination of the implications of SOX on firm costs is conducted by Engel et al. (2006). They hypothesise that the costs imposed by SOX should warrant avoidance strategies by the affected firms, where the specific strategy is going private. Engel et al. (2006) examine firms at the public/private margin to establish if the introduction of SOX was associated with an increased number of firms that deregistered and went private. Together with the results obtained by Berns (2011), this result is highly relevant for the policy implications of the ESTMA where delisting, despite being an extreme measure, is a possible action that could be used by firms to avoid having to comply with ESTMA in the future.

Gao et al. (2018) also make use of an event study methodology to examine the stock and bond market reactions to the events that resulted in the passing of the Dodd-Frank Act in the US in

2010. The paper is focused on examining the effects on systematically important firms with the aim to investigate if the act is effective in reducing big financial institutions risk-taking and to shed light on whether this type of regulation could be employed to help end the bailout policy. The first step in this analysis is an event study of the effect on the firms affected by the Dodd-Frank Act. They use data on 45 financial institutions including the six biggest banks and hypothesize that the introduced legislation would be effective in reducing the bailout expectation in future financial emergencies through a negative effect on stock returns and a positive effect on bond returns during the introduction of the Dodd-Frank Act. They conclude that the Dodd-Frank act was effective in reducing the financial institutions' risk-taking as bigger banks and financial institutions experienced a change in firm value through large negative abnormal returns over the observed events. Notable about the study by Gao et al. (2018) is that the problematic aspects of small sample sizes proclaimed by McWilliams and Siegel (1997) are not addressed. Given a small sample, outliers could have an increased influence on the result.

The number of studies that examines disclosure requirements within the field of extractive sector is naturally limited due to the few numbers of legislative initiatives in this area. Due to the novelty of ESTMA, the current literature on the implications of this specific legislation is yet to be written. Despite this, some efforts have been made to examine the effect of transparency-based legislation on a firm's value within the extractive sector in the implementing country using similar methods as Zhang (2007), Engel et al. (2006) and Gao et al. (2018).

With the aim to analyse if a regulatory change is affecting the firm value of European extractive firms Johannesen and Larsen (2016) focus on the legislative process of the EITI during the introduction of legislation designed to increase transparency and to curb tax evasion for Oil, gas and mining companies listed on European stock exchanges. Through an event study, the authors hypothesize that the introduction of legislation on more stringent rules on tax reporting will have negative effects on affected firms' value. The authors use data on 3642 firms in the extractive industries in 13 different countries out of which 1978 are listed on at least one European stock exchange which makes them compliant under EITI. The remaining firms are used as a control group. They conclude that the introduction of legislation to increase transparency in the European extractive sector was associated with negative abnormal returns of 5 to 10 percent over the observed events, meaning that the introduction of EITI affected the firm value of compliant firms negatively. Johannesen and Larsen (2016) conclude that this is suggestive that transparency can potentially be an effective tool to combat tax evasion in the

extractive sector. The conclusions made by Johannesen and Larsen (2016) I argue should be interpreted cautiously as the analysis is partly based on average abnormal returns for a sample of firms from several different countries. The effect of the introduction of the legislation could be expected to differ depending on the country origin of the firms in the control group. For example, as the legislation was passed some of the firms in the control group might also have experienced negative abnormal returns based on the expectation that similar legislation will in the future apply to them as well. Furthermore, it is a difficult task to untangle the part of the decline in firm value stemming from expected future costs from the part that originates from the actual effectiveness of the legislation.

Seitz (2016) makes use of an event study to examine the stock market reaction of affected firms during the introduction of the Kimberly Process Certification Scheme, KPCS, which is a certification process established by the UN General Assembly to prevent conflict diamonds entering the mainstream markets. The KPCS bares similarities with the EITI initiative. The mechanism through which the Certification Scheme intends to decrease conflict diamonds entering the market is based on increased transparency where firms in participating countries have to agree to monitor and disclose both internal trade as well as import and export of diamonds. Another similarity with EITI is that the KPCS tasks participating countries governments with drafting legislation to fulfill the KPCS requirements. Seitz (2016) hypothesise that the introduction of this regulation would have negative effects on the firm value of mining and jewellery firms. A large sample of firms from nine different countries is analysed. It is concluded that mining companies and jewellery companies are affected differently where mining companies suffered from negative effects on firm value to a larger extent than jewellery as a result of the introduction of the KPCS. Seitz (2016) does not use a control group to compare the results for the used sample, however, the analysis is performed on two different event window lengths to further asses the analysis' ability to isolate the events of interest. The paper by Seitz (2016) and a part of the analysis in Johannesen and Larsen (2016) differ methodologically from this paper in the use of the method of estimating the normal performance of the analysed firms' stock returns as the constant mean return model is used. This model can be criticised for simplifying the movement of stock returns over time as opposed to the market model used in this study. However, in line with Seitz (2016), this study utilises a shorter event window as a robustness check.

Additionally, based on the assumption that there are no heterogeneous effects within the sector, Johannesen and Larsen (2016) treat the whole extractive sector as one while Seitz (2016) treats mining and jewellery companies separately. Albeit the logic behind examining the whole industry as one is sound as legislation like EITI and ESTMA is targeted at the industry as a whole, dividing the sample into subgroups adds a dimension to the analysis. Namely that a potential reaction is driven by a specific part of the extractive industry which is of interest both for policymakers but also for further research regarding the reasons for potential negative firm value effects.

2. Method and data

2.1 Conceptual Framework and Hypothesis Development

The phenomena of corruption will undoubtedly have complex and far-reaching effects. However, this kind of regulatory change will have short-term effects on the affected firms' value in terms of stock return which can only move in two directions. The concept behind examining stock returns as a measure of firm value is based on the fact that the listed firm's value is expressed in their stock price. Which in turn reflects the present value of future cash flows and costs. Thus, the stock market reaction to a certain event is indicative of the firms' attitude towards the expected implications of that event. On one hand is the fact that this kind of strengthening of the regulatory environment would be preferable for affected firms. Admati and Pfleiderer (2000) assert that transparency regulation will allow firms in the extractive industries to see how much their competitors are paying for the development of oil and gas or mineral products. This should result in that shareholders are given the tools to penalize firms that are perceived to not behave in accordance with established norms, with regards to the firm's government payments. Under those circumstances, shareholders would enjoy the benefits of a higher level of transparency which would also be reflected in the stock returns of affected firms during the introduction of ESTMA as a positive reaction. Similarly, the shareholders may have incentives to encourage corruption if it is perceived to be beneficial for them, for instance, if the expected costs associated with the legislation is outweighed by expected future cash flows that would accrue from the company winning a profitable exploration contract through a bribe. This could manifest as a positive effect or no reaction at all. The opposite reaction is also theoretically predicted by Admati and Pfleiderer (2000) and confirmed for transparency-based legislation preceding ESTMA where it is shown that the notion of decreased future cash flows

due to higher costs associated with imposed legislation outweighed the potential positive effects and resulted in negative stock returns for the affected firms associated with the events leading up to the passage of mandatory disclosure requirements.

MacKinlay (1997) proposes to sort the events in categories based on the characteristics of the event in terms of the expected effect on the firm's stock returns. This approach is suitable in cases like the introduction of the Dodd-Frank Act in the US which was an object of legal challenges from the affected firms which caused the SEC to retract the proposal and rework it (Lynch, 2012). The events leading up to the enactment of the ESTMA, even though the affected firms opposed the proposed rules through different channels, was not in general object of any major action that resulted in an event that would be expected to affect the whole sector in the opposite direction. However, there is one exception regarding one particular event. Based on this framework and results obtained by previous studies on the effects of disclosure requirements on firm value both in general and in the extractive sector the two following hypothesis is stated regarding the expected result.

H₁: It is expected that all events are associated with negative stock market returns for both mining firms and oil and gas producers.

With the exception of the official release of the ESTMA rules on the 16th of January 2014 for which oil and gas producers are expected to show positive returns since the rules presented is targeting the mining sector exclusively (Publish What You Pay, 2014). Moreover, regarding the potential heterogeneous effects on the two subsamples, a second hypothesis is examined.

H₂: Oil and gas producers and mining companies are expected to experience stock return reactions in the same direction for events that should affect the subsectors similarly.

2.2 Data

The stock price data and stock index data are collected using Thompson Reuters Datastream and consists of daily stock prices for all listed mining and oil and gas producers on the Toronto Stock Exchange, TSX and TXS Ventures. The stock indices used in the TSX Composite. The data is comprised to pooled time series where stock prices are transformed into return data for each stock and index according to

$$R_{it} = \frac{P_{it} - P_{i,t-1}}{P_{i,t-1}} \quad (1)$$

Where P_{it} and $P_{i,t-1}$ is the price of stock i at day t and day $t-1$ respectively and R_{it} is the return of stock i . The procedure is identical for the index. The included events are selected from the legislative history of the ESTMA and thorough examination of the news coverage of the ESTMA in large newspapers. The data initially consists of 1226 Canadian mining firms and 275 firms from the Oil & Gas industry. Furthermore, from the sample firms that trade thinly, i.e. stocks with a non-positive daily trading volume which results in no return data, is excluded. This is done since thinly traded stocks are more likely to show a higher occurrence of zero and high non-zero returns which will bias the variance estimates for the cumulative abnormal returns estimates (Cowan and Sergeant, 1996). Dates which includes the release of firms' earnings announcements are manually cross-referenced with the event windows for each event. Firms which release earnings announcements during the event windows are excluded since it would bias the abnormal return estimates by affecting the returns in the event window. For each event firms that do not have return data for the full estimation and event window is excluded to guarantee equal weights of observations for each of the events. The final sample consists of 1050 to 1060 mining firms and 225 to 233 oil and gas producers depending on the event. The final sample is limited to listed Canadian firms, smaller firms that are not listed is even though they are affected by ESTMA is not taken into account as it would require other measures of firm value which entails difficulties with regard to data availability. The sample size is a potential issue in event studies as small sample allows outliers in the data to have increased influence on the results. To further examine this the distribution of the cumulative abnormal returns is plotted to assess the distributional properties and occurrence of outliers, this is mainly expected to be an issue for the sample of oil and gas producers which is the smaller sample. The results are presented in appendix B (Figures 2 and 3). The plots show some noticeable outliers for the sample of oil and gas producers. However, for the main result outliers are disregarded as all data points contain information that will be missing if observations are deleted.

2.3 Identifying assumptions

A crucial assumption regarding the event study method and also the main theoretical foundation is the efficient market hypothesis, EMH, as expressed by Fama (1970) in his famous survey paper. The EMH stipulates that all information available to the market is reflected in the stock prices. Understanding the sufficient conditions for market efficiency is straightforward. The requirements are no transaction costs when trading stocks, that all available information is costless available to all market participants and that said participants agree on the implications of the information for the prices and distributions of future prices for the stocks. In theory, the EMH can be categorized into three levels: The weak-Form implies that the market is efficient, reflecting all market information and that market return rates are independent. The Semi-strong form assumes efficient markets which reflects all market information, publicly available information and that the market quickly absorbs news. Given this form, it would be theoretically impossible for an investor to benefit from trading on the new information when it arrives. Lastly, the strong-form incorporates the two previous forms and reflects all information, market, public and private. This implies that an investor would not be able to benefit from trading on new information even if she was given the information privately. As easy as it is to understand the sufficient conditions it is to see that the market described above is not a representative illustration of modern financial markets. The modern stock market is characterised by the semi-strong form which enables the event study method to work. In the case of the weak-form, it would be impossible to conduct an event study since there would be no stock market reaction to news. Conversely, under the strong-form, the new information would already be reflected in the price of the stock and the event would cause no reaction. Based on extensive testing of the different forms Fama (1970) concludes that there is no important evidence against the weak and semi-strong versions and only limited evidence against the strong form. Thus, the assumption that the modern stock market is characterised by the semi-strong form of the EMH constitutes the basis for the use of the event study methodology.

2.4 Event history

An important assumption regarding the choice of event is the assumed to be exogenous Campbell et al. (1998). An exogenous event implies that the returns do not influence the

occurrence of the event. In the case of regulatory events, returns of the sample firms are assumed to not affect whether or not any of the events occur.

The time period of interest ranges from the first event on June 12, 2013, when former Canadian Prime Minister Stephen Harper publicly announces that the Canadian government would take increased action against corruption by requiring extractive firms to disclose payments made to governments (CBS, 2013). The next event is the formal signing of the 2013 Lough Erne G8 Summit declaration on transparency in the extractive sector on the 18th of June 2013 (BBC, 2013). These two initial events are important based on their symbolic value. Political events of this type are suitable candidates as political news is known to affect stock markets to different degrees. The announcement of regulatory changes in this context was also shown by Gao et al. (2018) to be associated with negative effects on firm value. The next event occurs on the 14th of June 2014 when the Resource Revenue Transparency Working Group, RRTWG, officially presents the rules that will lay the foundation for the recommendations on mandatory disclosure of payments of extractive firms to governments (Publish What You Pay Canada, 2014). Rule announcements are commonly used in policy event studies as the information released gives affected firms a first view of the final form of the legislation. In this case the event carries extra weight since at this stage the ESTMA only applied to mining companies.

Furthermore, event dates that are derived from the legislative process of the ESTMA are included, starting with the date when the proposed rule is tabled in the Canadian parliament for the first time on the 23rd of October 2014 (House of Commons of Canada, 2014a). These types of events are useful candidates in the analysis since an action has occurred, in this case parliament voted on the passing of the rule and the outcome of a vote is not intended to be known by the public beforehand (Carroll & Lamdin, 1993). The most important event of the legislative history of the act is the final reading in parliament, which is also a vote. This took place on the 16th of December 2014 (House of Commons of Canada, 2014b). The third reading of the proposal in parliament is the last stage where the proposal can be struck down, after passing the third vote the legislation is only a formality away from being enacted as law. This formality being the royal assent which is a ceremony where the Governor General grants the bill royal assent. This means that the bill is officially passed as Canadian law. ESTMA received royal assent on the 14th of December 2014 (House of Commons of Canada, 2014c), this date is excluded since after passing the third reading and vote there is virtually no uncertainty that the proposal will not become law. The actual implementation of ESTMA took place on June 1,

2015. The date is not included in the analysis as it was predetermined to occur at that date and therefore made it highly anticipated by the market. The included dates are presented in table 1.

Table 1. *List of included events*

Event	Date
Prime Minister announces increased action against corruption	12 Jun 2013
The official signing of G8 Lough Ern declaration	18 Jun 2013
The official release of the ESTMA regulatory framework	16 Jan 2014
The first reading of the ESTMA in parliament	23 Oct 2014
ESTMA passes final vote in parliament	10 Dec 2014

2.5 Event study methodology

The traditional event study methodology is nothing new; it has generally been used extensively within the fields of economics, and specifically in finance. The method is preferable when examining the short-run impacts of a certain event, or a series of events on firm value. The long-term impacts of any specific event are undoubtedly far more complex and require more data over an extended period of time to measure different aspects of the analysed events (MacKinlay, 1997). An event study draws its advantages from the fact that in the very short term, i.e. the moment when the event occurs, the effect would be reflected in the stock price of the firms. Over a longer period this effect will be outweighed by other factors that affect stock prices but conditional on correct specified event dates, the stock price reaction is interpreted as the present value of future cost related to the introduction of the legislation.

An event is defined as an unanticipated event where new information is presented to the market. It follows that if the information is expected the result will be the same as assuming the strong-form of EMH which will make it impossible to assess the effect of an event on stock returns.

An event window is defined as a period of days during which the impact of the event on the stock return will be observed. The next step is to determine the length of the event window. This is generally done in one of two ways. On one hand, a fixed event window for all events is

used. This method is preferred when a large number of firms are to be analysed. On the other hand, individual event window lengths could be used for each stock. The latter is preferable if it is suspected that different stocks react to the news with different speed, this method is however traditionally less used in the economics literature (Lev, 1989). As the first method is more appropriate with large data samples, a fixed event window is used.

McWilliams and Siegel (1997) propose that the likelihood of information leakage should determine how early before the event the event window should start. The likelihood of leakage is also higher in event studies examining regulatory changes as compared to the analysis of mergers and acquisitions which is also typically examined in event studies. In light of this, this study will make use of a five-day event window for each observed event where the day of the event is day 0 and the window will cover day -2 to +2. This allows the event window to capture the effect of information leakage by at most two days and also capture the effect of information that got released to the stock market after closing time.

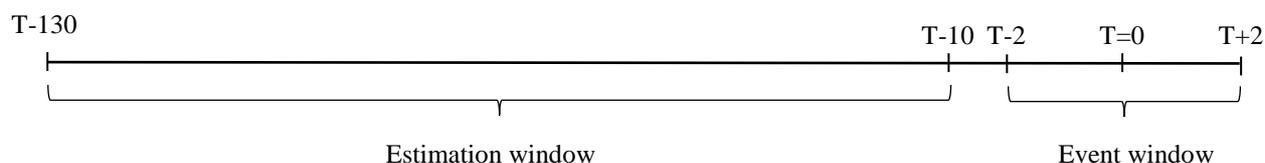


Figure 1. Event study timeline

The next step in the procedure is to construct the counterfactual level of returns. I.e. what returns each stock would yield had the event not occurred, referred to as the stocks' normal performance. This can be done in several ways where the simplest method is the constant mean return model used by Seitz (2016) which uses the mean return of each stock in the estimation window as the estimate of normal performance. This method tends to oversimplify the relationship between stock returns in different time periods. Preferable over the constant mean return model is the market model, which relates the returns of each stock to the market returns through OLS estimation. Except for the two above mentioned models, the event study literature presents a number of more advanced models to estimate the normal performance of analysed stocks. The most popular being variations of multiple factor models and the CAPM. However, MacKinlay (1997) concludes that more sophisticated methods offer little benefit compared to the market model.

The following steps are presented to estimate the cumulative abnormal returns during the event window according to the market model. The rate of return for each firm is estimated according to

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (2)$$

$$E(\varepsilon_{it} = 0), \quad \text{var}(\varepsilon_{it}) = \sigma_\varepsilon^2$$

Where R_{it} is the rate of return of firm i on day t , R_{mt} is the rate of return on a market portfolio of stocks on day t . A broad market index is preferred to estimate the normal performance, thus TSX composite index is used which is the principal broad Canadian stock index. α_i is the intercept and β_i is the systematic risk of stock i , ε_{it} is the error term. With the parameter estimates from the market model, the abnormal returns of a single stock can be estimated by rearranging (2) into

$$AR_{it} = R_{it} - \hat{\alpha}_{it} - \hat{\beta}_i R_{mt} \quad (3)$$

Where AR_{it} is the abnormal return of stock i at day t , $\hat{\alpha}_{it}$ and $\hat{\beta}_i$ are the OLS parameter estimates which are derived from the regression of R_{it} on R_{mt} in the estimation window. It is important for the event window and estimation window not to overlap. This assures that the estimates from the OLS estimation are not influenced by the returns in the event window. As suggested by MacKinlay (1997) a 120-day estimation window is used. Starting 130 days before the event window and ends 10 days before.

The abnormal returns for firm i during the time of the event is the actual returns for firm i in the event window less the expected return for firm i in the event window estimated from the estimation window. Since an event study observes data across stocks and over more than one day the abnormal returns for each stock has to be aggregated. By aggregating each stock's abnormal returns over days in the event window the Cumulative Abnormal Returns (CAR) for the stock is calculated as

$$CAR_i(t_1, t_2) = \sum_{i=t_1}^{t_2} AR_{it} \quad (4)$$

Where the period between t_1 and t_2 is the event window. By taking the sum of the Cumulative Abnormal Returns for all stocks and divide by the total number of stocks the estimated average cumulative abnormal returns for all stocks in the event window is calculated.

$$\overline{CAR}(t_1, t_2) = \frac{1}{N} \sum_{i=1}^N CAR_i(t_1, t_2) \quad (5)$$

The variance of the cumulative abnormal returns across the sample for the event window is calculated as

$$var(CAR(t_1, t_2)) = \frac{1}{N-1} \sum_{i=1}^N (CAR_i - \overline{CAR})^2 \quad (6)$$

As positive and negative reactions should offset each other on average across firms the final step is to test the null hypothesis that the average cumulative abnormal returns are equal to zero during the event window surrounding each event. The significance test of the average cumulative abnormal return is conducted using the test statistic

$$\theta = \sqrt{N} \frac{\overline{CAR}(t_1, t_2)}{\sqrt{var(CAR(t_1, t_2))}} \quad (7)$$

If the test result is significant the average cumulative abnormal returns are statistically different from zero and the event is interpreted to have a significant effect on stock returns as the stock price has been revaluated as a result of the event.

3 Results

In this section the main results are presented in table 2 and 3 followed by the result from a sensitivity analysis performed by reproducing the main analysis with outlier robust regression for estimation of normal performance (table 4 and 5). Table 6 and 7 present the results from further robustness checks using a shorter event window. All results are presented chronologically event by event. For descriptive statistics for cumulative abnormal returns for each event and subsector see appendix 2.

Table 2. Average Cumulative Abnormal Returns for oil and gas producers

Event date	Event	CAR	
		N	5-day
12 Jun 2013	Prime Minister announces increased action corruption	227	-0.006 (0.655)
18 Jun 2013	The official signing of G8 Lough Ern Declaration	227	-0.005 (0.695)
16 Jan 2014	The official release of the ESTMA regulatory framework	166	-0.008 (0.563)
23 Oct 2014	The first reading of ESTMA in parliament	232	0.026** (0.045)
10 Dec 2014	ESTMA passes final vote parliament	232	-0.045*** (0.005)

Note: *p*-values in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Normal performance estimated with TSX Composite index.

By observing table 2 it is apparent all events except for the first reading in parliament is associated with negative abnormal returns. The first two events both show negative abnormal returns of 0.6 and 0.5 percent respectively, however, the null hypothesis that the abnormal return is statistically different from zero cannot be rejected for any of the two events. The third event, the release of the rules, is associated with average abnormal returns of negative 0.8 percent over the event window. The first reading of ESTMA in parliament over the 5-day event window is associated with a positive average abnormal return of 2.6 percent which is statistically significant on the 5 percent level while the final reading and vote of the legislation on the 10th of December 2014 is associated with negative average abnormal returns of 4.5 percent. For this event, the null hypothesis that the average abnormal return is 0 can be rejected at the 1 percent level.

Table 3. Average Cumulative Abnormal Returns for mining firms

Event date	Event	CAR	
		N	5-day
12 Jun 2013	Prime Minister announces increased action against corruption	1057	-0.003 (0.689)
18 Jun 2013	The official signing of G8 Lough Ern Declaration	1050	-0.007 (0.396)
16 Jan 2014	The official release of ESTMA regulatory framework	1063	0.078*** (0.000)
23 Oct 2014	The first reading of ESTMA in parliament	1056	-0.010 (0.366)
10 Dec 2014	ESTMA passes final vote in parliament	1067	-0.002 (0.787)

Note: *p*-values in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Normal performance estimated with TSX Composite index.

Turning to baseline results of mining firms in table 3, the two initial events were associated with negative abnormal returns of 0.3 and 0.7 percent respectively. As in the sample of oil and gas producers, none of these two events is proven to be significantly different from zero. The first event for which the null hypothesis that the abnormal returns over the 5-day event window are equal to zero could be rejected is the official release of the ESTMA rules on 16 January 2014 which is associated with positive abnormal returns of 7.8 percent, which is statistically significant on the one percent level. The first reading of the proposal in parliament did show negative abnormal returns of 1 percent, however, it is not significantly different from zero. The event on 10 December 2014, when the final vote took place was over the 5-day event window is associated with a non-significant abnormal return of negative 0.2 percent.

4 Sensitivity analysis

4.1 Outlier robust estimation of normal performance

A common problematic aspect of regression analysis is that inference drawn from OLS regression is sensitive to outliers. Estimated normal performance of the stocks could therefore potentially rely on outliers in the return data for the stock. These outliers could be the result of confounding events that are not controlled for with the event study method (McWilliams and Siegel, 1997). Throughout the event study literature outliers are typically handled in one of

three ways; ignoring them, arbitrarily decide at which cut-off an observation is regarded as an outlier and then delete them from the sample or winsorizing either the largest or the smallest values which is a method of replacing them with other values which are also arbitrarily chosen (Sorokina et al. 2013). The first method is also what is used for the main results of this paper. Simply deleting extremely high or low abnormal returns from the sample may improve the accuracy of the results. However, all data points represent information, which will be lost if observations are deleted. Despite this, if outliers are ignored it could result in the estimated normal performance being possibly tilted towards outliers which means that the estimated normal performance could be heavily based on these outliers. This could have implications for the result as the effect of the event might not be observed if the normal performance is skewed. As a robustness check to see whether the effect of the events regarding the introduction of the ESTMA on affected firms' stock returns is skewed to depend on outliers in the data, the analysis is performed using a regression method more robust to outliers than traditional OLS. As proposed by Sorokina et al. (2013) Huber weighted regression is used to estimate normal performance. The M-Estimator developed by Huber (1973) assigns lower weights to the outliers in the data, reducing the influence of outliers on the fitted regression line¹. This allows for information to be kept in the data while at the same time decreasing the influence of outliers that might skew the result.

¹ For a more detailed description of the weighted regression method the reader is referred to the original paper by Huber (1973).

Table 4. Average Cumulative Abnormal Returns for oil and gas producers

Event date	Event	CAR	
		N	5-day
12 Jun 2013	Prime Minister announces increased action against corruption	227	0.017 (0.289)
18 Jun 2013	The official signing of G8 Lough Ern Declaration	227	0.017 (0.103)
16 Jan 2014	The official release of ESTMA regulatory framework	225	0.023 (0.147)
23 Oct 2014	The first reading of ESTMA in parliament	232	-0.015 (0.150)
16 Dec 2014	ESTMA passes final vote in parliament	225	0.042*** (0.000)

Note: *p*-values in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Normal performance estimated with TSX Composite index. Huber weighted regression used to estimate normal performance.

Table 4 shows the average abnormal returns for oil and gas producers over the 5-day event window where Huber weighted regression and the TSX composite stock index was used to estimate normal performance. As can be seen, all events were associated with positive abnormal returns except for the first reading of the proposal in parliament. The first two events were both associated with abnormal returns of 1.7 percent while the official rule release was associated with abnormal returns of 2.3 percent. The first reading which was the only event associated with negative abnormal returns for oil and gas producers showed abnormal returns of negative 1.5 percent. Moreover, oil and gas producers experienced abnormal returns of on average 4.2 percent associated with the final vote in parliament, this is the only event for which the null hypothesis could be rejected at any level.

Table 5. Average Cumulative Abnormal Returns for mining companies

Event date	Event	CAR	
		N	5-day
12 Jun 2013	Prime Minister announces increased action against corruption	1057	0.011* (0.076)
18 Jun 2013	The official signing of G8 Lough Ern Declaration	1050	0.001 (0.853)
16 Jan 2014	The official release of ESTMA regulatory framework	1063	0.113*** (0.000)
23 Oct 2014	The first reading of ESTMA in parliament	1056	0.018* (0.078)
10 Dec 2014	ESTMA passes the final vote in parliament	1059	0.009 (0.276)

Note: *p*-values in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Normal performance estimated with TSX Composite index. Huber weighted regression used to estimate normal performance.

From table 5 it can be seen that all events are associated with positive abnormal returns for mining firms, where the announcement made by former Prime Minister Stephen Harper was associated with statically significant abnormal returns of 1.1 percent. The signing of the G8 declaration was associated with abnormal returns of 0.1 percent; for this event, the null hypothesis that the abnormal return is 0 could not be rejected. The days surrounding the official release of the ESTMA rules on 16 January 2014 was associated with statistically significant abnormal returns of 11.3 percent. The subsequent event, the first reading in parliament was associated with positive abnormal returns of 1.8 percent. During the days surrounding the last vote, mining firms experienced abnormal returns of 0.9 percent; which was not statistically significant.

4.1 3-day event window

Following Seitz (2016) the analysis is also conducted using a 3-day event window. A 3-day window is the smallest window that can be used to capture potential leakage of information to the market. Additionally, the event window needs to cover a minimum of one day following the event day to be able to capture the effects of unanticipated information that is released after the stock markets have closed. This implies that a longer event window will theoretically give a better opportunity to capture any effects of the event while simultaneously increasing the difficulty of isolating the effect of the event. The 3-day window is used as an additional

robustness check as differences in abnormal returns between different event window lengths could indicate the presence of confounding event that could drive the result.

Table 6. Average Cumulative Abnormal Returns for oil and gas producers. 3-day event window

Event date	Event	N	CAR 3-day
12 Jun 2013	Prime Minister announces increased action against corruption	227	-0.004 (0.731)
18 Jun 2013	The official signing of G8 Lough Ern Declaration	227	-0.007 (0.050)
16 Jan 2014	The official release of ESTMA regulatory framework	225	-0.020*** (0.002)
23 Oct 2014	The first reading of ESTMA in parliament	232	0.026** (0.039)
10 Dec 2014	ESTMA passes final vote in parliament	225	-0.032 (0.157)

Note: *p*-values in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Normal performance estimated with TSX Composite index.

Over the 3-day event window surrounding the first event oil and gas producers' experienced negative abnormal returns of negative 0.4 percent. The second event, the official signing of the G8 declaration was associated with abnormal returns of negative 0.7 percent. None of the two first events yielded statistically significant results. The official release of the ESTMA rules on the 16th of January 2014 was associated with statistically significant negative abnormal returns of 2.0 percent while the following event, the first reading of the proposal in parliament was associated with positive abnormal returns of 2.6 percent, statistically significant on the five percent level. When the proposal passed the last vote in parliament oil and gas producers' experienced negative abnormal returns of 3.2 percent, however not statistically significant.

Table 7. Average Cumulative Abnormal Returns for mining companies. 3-day event window

Event date	Event	N	CAR
12 Jun 2013	Prime Minister announces increased action against corruption	1057	3-day -0.007 (0.178)
18 Jun 2013	The official signing of G8 Lough Ern Declaration	1050	-0.023*** (0.000)
16 Jan 2014	The official release of ESTMA regulatory framework	1063	0.067*** (0.000)
23 Oct 2014	The first reading of ESTMA in parliament	1056	-0.008 (0.375)
10 Dec 2014	ESTMA passes final vote in parliament	1067	-0.016 (0.002)

Note: *p*-values in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Normal performance estimated with TSX Composite index.

Regarding the mining companies the announcement made by the former prime minister demanding action against corruption was associated with negative abnormal returns of 0.7 for which the null that the abnormal returns are statistically significantly different from zero could not be rejected. The signing of the G8 declaration was associated with negative abnormal returns of 2.3 percent, this is statistically significant at the one percent level. The official release of the rules is statistically significant on the same level as the previous event. The three days surrounding the event is associated with positive abnormal returns of 6.7 percent. For the two parliamentary votes, the null that the abnormal returns surrounding these events are different from zero could not be rejected. The abnormal returns are negative 0.8 and negative 1.6 percent for the first and second vote respectively.

5 Discussion

5.1 Results

Studying the results above it is evident that the events leading up to the enactment of ESTMA did affect the two included subsectors differently. Turning to the subsector of oil and gas producers and the first and second analysed events, there is no significant effect on firm value. How the stock market reacts to regulatory events is dependent on both the expected costs and benefits of the legislation and how the firms perceive the likelihood of the legislation to become permanent. The result, or lack thereof, surrounding these two first events is indicative that

investors might not attach that much value to this kind of symbolic events. This is not surprising given that the market, investors and all people historically have learned to account for the discrepancies between what politicians say and what they later do. For mining companies, the result of the first and second event tends to be contradictory as the first event was associated with a weak positive effect when controlling for outliers but the effect while the second event is weakly negative over a shorter event window. However, none of the events show results robust across different event window length or methods of estimating normal performance. Indicating that there might be both confounding events present and that the result is sensitive to outliers.

For the next event, the official release of the ESTMA rules on 16 January 2014, oil and gas producers were expected to show positive results given that the presented rule was targeting mining firms exclusively. The result goes against the hypothesis over the 3-day window. This is most likely due to the expectations of the market regarding the oil and gas producers. Even though the subsector was not included in the released proposal they might still have been expected to be part of the legislation in the future which could explain the negative reaction. However, as the effect surrounding that event is not robust to differences in the event window size and the influence of outliers the result could be driven by confounding events. For mining firms, however, the result is positive and robust for outliers and changes in event window length. This is surprising given that mining corporations were hypothesized to show negative abnormal return. The same surprising result but not robust to outliers in the data is the market reaction for oil and gas producers surrounding the first vote in parliament which was expected to be associated with negative abnormal returns as the proposal that was tabled in parliament included mining firms and oil and gas producers alike.

These two instances represent the only events where the result proved to be mainly statistically significant and robust to different specifications while simultaneously being opposite to the hypothesis. A possible explanation for these results is related to what Seitz (2016) asserts regarding the introduction of the conflict mineral rules of the KPCS. He argues that as the legislation is introduced it creates a barrier to market entry for new firms as the costs of operating in the extractive sector now is higher. This is plausible since it could be perceived by established firms as positive from a competitive perspective. This assumes that the aforementioned positive effect of the legislation outweighs the negative aspects of the increased costs and the reason for that could be many. A plausible explanation is the alternative hypothesis

noted by Zhang (2007) that investors expected the rules to be stronger than they turned out to be, resulting in positive abnormal returns as the information of the actual level of stringency hit the market. Another possible explanation is that the firms valued the positive aspects of transparency legislation higher than the negative aspects stemming from increased costs. Higher transparency support trust between firms and their shareholders, when investors get access to more information about the firms the market value of the firms should be closer to the true value. Which is also expected to increase firm value. Regarding the first parliamentary vote, the result for mining companies is weakly positive but lower in magnitude than the first vote, this is to be expected as the probability that the proposed legislation would be struck down should be diminishing as the events pass. This event is however not robust to changes in the event window length which indicates that something other than the specified event drove the market reaction.

For oil and gas producers the uncertainty about the potential implementation of the legislation remained, which is confirmed by the significant negative abnormal returns surrounding the last event where the ESTMA passed the final vote in parliament. During the introduction of transparency legislation, the finalization of the legislative process is often associated with negative abnormal returns for affected firms. This is, of course, to be expected. Until that event finally confirms the existence of the law, there will always be a probability that the proposal will be struck down at some point during the process. However, the abnormal returns shift sign and equally significant but positive of similar magnitude as outliers are accounted for. This represents an example of when the problem of outliers is imminent. The result should be interpreted with caution as the true effect cannot be untangled without closer examination of these outliers. Also, as the shorter event window did not capture any significant effect of the event the reaction is probably driven by a confounding event two days prior or two days after the event date.

Across all events, the only one associated with significant abnormal returns across both different event window lengths and robust to outliers is the official release of the ESTMA rules for mining companies. This is also the only event where the economic significance is worth mentioning, ranging from 6.7 to 11.3 percent for mining companies. Also, the first parliamentary vote was associated with fairly robust positive abnormal returns for oil and gas producers. The overall result from this analysis is that the introduction of ESTMA was not associated with negative stock return reactions. This goes against both what was hypothesized

and what previous results obtained from analyses of the introduction of similar legislation. Comparing this to the results obtained by Gao et al. (2018), the most plausible explanation I argue stems from the composition of the Resource Revenue Transparency Working Group. Which guaranteed that affected firms had greater influence of the content of the legislation compared to the Dodd-Frank Act in the US. This is also supported by the lawsuits filed by the American Petroleum Institute against the SEC during the rule designing process of the Dodd-Frank Act (Lynch, 2012). However, as the paper by Gao et al. (2018) includes firms from other industries as well the effect found could be driven by other industry sectors. The same conclusion is not applicable to the same extent comparing this study with the results obtained by Johannesen and Larsen (2011) and Seitz (2016) as compliance with EITI and the KPCS requires each member state to put together a working group much like the RRTWG in Canada. A possible explanation for the different result compared to the latter studies could be related to lobbying activities. The degree of lobbying is unobserved in this study but could be an underlying reason contributing to the positive reactions to the Canadian extractive sector to the Introduction of ESTMA. Moreover, the lack of negative effects found resulting in not being able to confirm the hypothesis that firms would be affected negatively could be related to the same critique initially directed to the paper by Johannesen and Larsen (2011). The fact that Canada had the opportunity to observe the introduction of the Dodd-Frank Act in the US and the EITI Initiative could have brought about the expectation that similar legislation would come to apply for Canadian firms as well which could have made the market effect occur before the analysed period.

Regarding the second hypothesis, since the rule release which was the only event associated with an actual effect on any subsector was expected to affect the two firm categories in opposite direction, the second hypothesis that both subsectors should be affected similarly could only be confirmed in terms of the absence of a systematic effect. This result is, however, more likely due to the anticipation of the news rather than subsector specific characteristics of the firms. Thus, this lends support to methodological choice to not divide the sample of the extractive sector into smaller subsectors common in previous studies (Johannesen and Larsen, 2016; Gao et al., 2018; Zhang, 2007).

5.2 Limitations

For future research, it is important to comment on some limitations of this study. From a methodological perspective the most important one is the occurrence of serial correlation. Meaning that the abnormal return of stock i at day t is correlated with the abnormal return at day $t-1$. With pooled cross-sectional time series data, the cross-sectional test statistic used in this study does not account for the serial correlation of the cumulative abnormal returns of the firms over time (Bernard, 1987). The most important implication of serial correlation for the event study method is inflated t-values which results in possibly finding significant results when there would be none if serial correlation had been accounted for. To mitigate serial correlation a more sophisticated statistical test is required. For future researchers conducting event studies like this one, I suggest consideration of the adjusted standardized cross-section test developed by Kolari and Pynnönen (2010) which accounts for serial correlation. Furthermore, the test statistic in any event study is based on the normality assumption coupled with a large sample size. This implies that the cumulative abnormal returns converge to normality as the sample size increases, which makes the test statistic normally distributed under the null hypothesis that the average cumulative abnormal returns are equal to 0 (McWilliams and Siegel, 1997; Brown and Warner, 1985). However, by closer examination of the distributional plots in Appendix B it can be seen that the distribution of the cumulative abnormal returns are only approximately normally distributed with excessive kurtosis. As this is not a methodological paper it is not concerned with quantifying the deviation from the normality assumption used for the statistical test. However, to add further robustness, future researchers could make use of a non-parametric rank test as the one developed by Corrado (1989) which accounts for data that is not normally distributed to assess what effect the deviation from normality has on the results².

Another documented weakness of this event study methodology is the absence of a formal control group. The problem is by construction circumvented by the estimation of the normal performance of the sample stocks which theoretically works as the control group. The problematic aspect of the approach is that the broad stock index used to estimate normal performance include firms that are not affected by the legislation since some firms included in the index belongs to different industries and are affected differently by economic news and

². For a more recent discussion on non-parametric test methods in event studies see Kolari and Pynnönen (2011).

events that shape the normal performance. Additionally, some of the sample stocks are included in the broad index. This results in that the broad index used is a less than perfect proxy for the counterfactual price movements of the stocks, which might bias the estimated normal performance. Any event study would benefit greatly from finding a control group that is not affected by the treatment and comparable to the analysed firms since it makes it possible to estimate the normal performance of the sample firms based on other firms with same characteristics (Leuz, 2007). However, as pointed out by Leuz (2007), finding a suitable control group from a different regulatory environment is a difficult task as the control group has to be comparable to the analysed firms in terms of firm characteristics while at the same time be affected in the same way by news that affects stock prices. A potential resolution in the particular case of the introduction of ESTMA for future researchers to evaluate is the use of US extractive firms as a control group. As Zhang (2007) notes, the correlation between Canadian and US stock indices are high, indicating that firms from these two countries are affected similarly by news. This would theoretically make US extractive firms a uniquely suitable control group to compare the result from this study with.

For the purpose of examining the short-term effects of specific events on the firm value, the economic literature on the effects of disclosure requirements does not present a great many options. However, as explored by McWilliams and Siegel (1997) and performed by Zhang (2007) as an extension of her analysis the next step in the examination of event effects is to investigate the explanatory factors behind the firms' cumulative abnormal returns. This is traditionally done by estimation of a regression model with explanatory variables on the cumulative abnormal returns. In the case of transparency legislation in the extractive industry, possible independent variables could be variables indicating where in the world the firms do business and the level of corruption in those places. Additionally, firm-specific indicators of size and financial performance would be included as well as control variables for other costs the firms meet.

As this study analyses the effect of legislation specific to Canada it leaves little room for extrapolation of the results. Thus, it confirms the contribution of providing additional analyses as these kinds of legislation is introduced in different regulatory environments. An event study aims at showing the presence of a correlation between a firm's value and the occurrence of a specific event, which is done through the analysis of the firm's abnormal returns surrounding the event. Nevertheless, as it is theoretically impossible to account for every event other than

those analysed that could have an effect on stock prices it is difficult to conclude causality. For future studies, a procedure to mitigate the potential bias caused by confounding events is to conduct an ex-post analysis of news events in the examined event windows. This is performed by Zhang (2007) which allows her to distinguish some confounding events which makes it possible to further isolate the effect of the analysed events. In addition to that, this study does not attempt to quantify the impact on firm value and does not account for heterogeneous effects due to firm characteristics. It is reasonable to assume that the costs associated with this ESTMA for some of the world's biggest mining corporations differs considerably compared to one of the smaller oil and gas producers in the sample, and vice versa. This has been proven to be an issue in previous studies where for example Johannesen and Larsen (2016) emphasizes that the average compliance cost for EITI was \$US 0.3 million based on data from the United Kingdom while studies regarding SOX derives cost of up to \$US2.3 million to comply with this legislation together with the assertion that that number grows with every new study (Carney, 2016). This speaks to the difficulty of determining the exact cost of compliance with transparency legislation and distinguish it from the effect that is due to the effectiveness of the legislation. This is a yet unexplored field of policy implications for future researchers to examine more closely.

6 Conclusion

The aim of this study was to examine if the introduction of transparency based anti-corruption legislation in terms of the Canadian ESTMA was associated with abnormal returns for affected firms to answer the question whether this process had a negative effect on firm value. This was done through an event study where the key events leading up to the enactment of the ESTMA was analysed based on stock return data from Canadian listed oil and gas producers and mining companies respectively. The evidence shows that only one out of the events leading up to the enactment of the ESTMA are associated with statistically significant and robust abnormal returns for mining companies, this was the official release of the ESTMA framework which showed positive abnormal returns ranging from 6.7 to 11.3 percent. For oil and gas producers the result is less compelling even though one event, the first reading of ESTMA in parliament is relatively robust and showing positive abnormal returns of around 2.6 percent. Compared to the Dodd-Frank Act in the US and more importantly the Global EITI initiative the introduction of ESTMA is not associated with systematic negative effects on firm value for Canadian

extractive firms. On the contrary, the evidence of this study shows weak support for an overall positive effect on firm value surrounding the analysed events. The positive result should be interpreted cautiously as the effect is not consistent over all events. From a policy point of view, the lack of systematic robust negative effects on firm value surrounding the events is important evidence for future policy development in the field of transparency-based legislation through mandatory disclosure requirements.

7. References

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8. Appendices

8.1 Appendix A. Descriptive statistics of cumulative abnormal returns

Table 8. *Descriptive statistics of CAR over 5-day event window*

Event	Median		Standard deviation		Min, max	
	Oil & gas	Mining	Oil & gas	Mining	Oil & gas	Mining
Stephen Harper announces increased action against corruption	-0.0021	-0.00299	0.1907	0.2075	-0.6966, 1.2761	-1.9283, 1.5951
Public signing of G8 Lough Ern declaration	-0.0019	-0.0075	0.2037	0.2532	-1.7864, 1.0249	-3.1823, 2.5212
The official release of ESTMA regulatory framework	-0.0118	0.0082	0.1437	0.4892	-0.5733, 0.5528	-1.0436, 8.1727
ESTMA passes the first reading in parliament	0.0001	-0.0169	0.1932	0.3435	-0.5909 1.01652	-3.2280, 4.0639
ESTMA passes final vote in parliament	-0.0298	-0.0178	0.1663	0.2434	-0.6590, 0.9169	-2.1221, 3.2748

Table 9. *Descriptive statistics of CAR over the 3-day event window*

Event	Median		Standard dev		Min, max	
	Oil & gas	Mining	Oil & gas	Mining	Oil & gas	Mining
Stephen Harper announces increased action against corruption	-0.0025	-0.0018	0.1805	0.1630	-0.6075, 1.8855	-0.9160, 1.6139
The official signing of G8 Lough Ern declaration	-0.0055	-0.0122	0.1479	0.1885	-0.5049, 1.0001	-2.1009 1.9076
Official release of ESTMA regulatory framework	0.0000	0.0025	0.0937	0.4589	-0.4774, 0.5369	-1.0204 8.9863
ESTMA passes first reading in parliament	0.0032	-0.0188	0.1901	0.2942	-0.5114, 1.0219	-2.1309 3.3732
ESTMA passes final vote in parliament	-0.0423	-0.0095	0.3357	0.1684	-1.1052, 4.0000	-0.9503 1.1429

Table 10. *Descriptive statistics of CAR over 5-day event window.*

Event	Median		Standard dev		Min, max	
	Oil & gas	Mining	Oil & gas	Mining	Oil & gas	Mining
Stephen Harper announces increased action against corruption	0.0007	0.0011	0.2401	0.1978	-0.5027, 2.7711	-1.9801, 1.6445
The official signing of G8 Lough Ern declaration	0.0004	0.0006	0.1578	0.2485	-0.50142, 1.0003	-0.9991, 8.2019
Official release of ESTMA regulatory framework	0.0004	0.0073	0.1296	0.4867	-0.5576, 0.5436	-0.9991, 8.2019
ESTMA passes the first reading in parliament	0.0024	0.0000	0.1712	0.3316	-0.3736, 1.0008	-3.0061, 4.0657
ESTMA passes the final vote in parliament	-0.0008	0.0001	0.1615	0.2412	-0.5003, 0.9988	-1.9823, 3.2556

Note: Huber weighted regression used to estimate normal performance.

8.2. Appendix B. Distribution plots for cumulative abnormal returns

Figure 2. Distributional plots: Cumulative Abnormal returns for Oil and gas producers. Events 1 - 5.

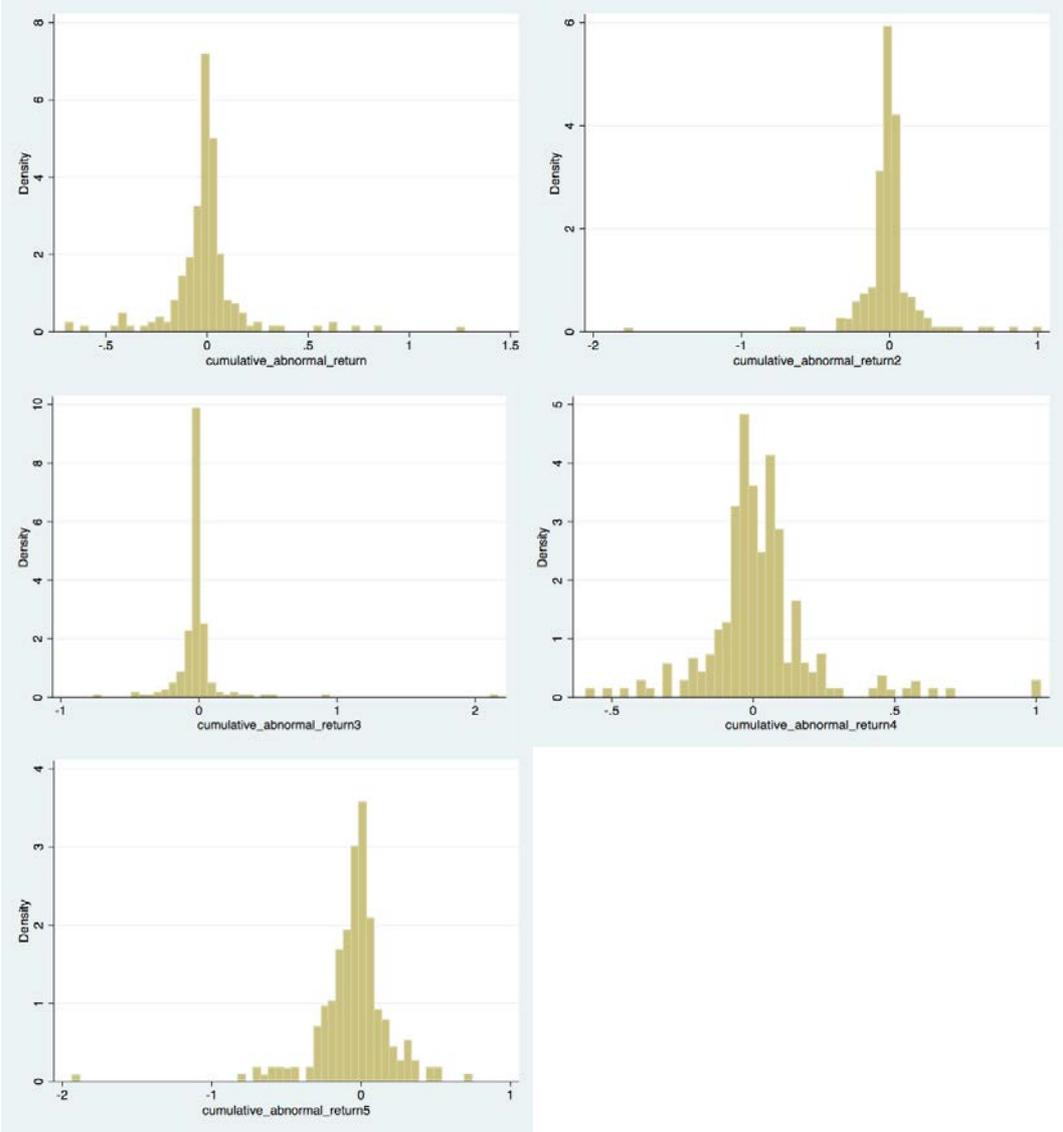
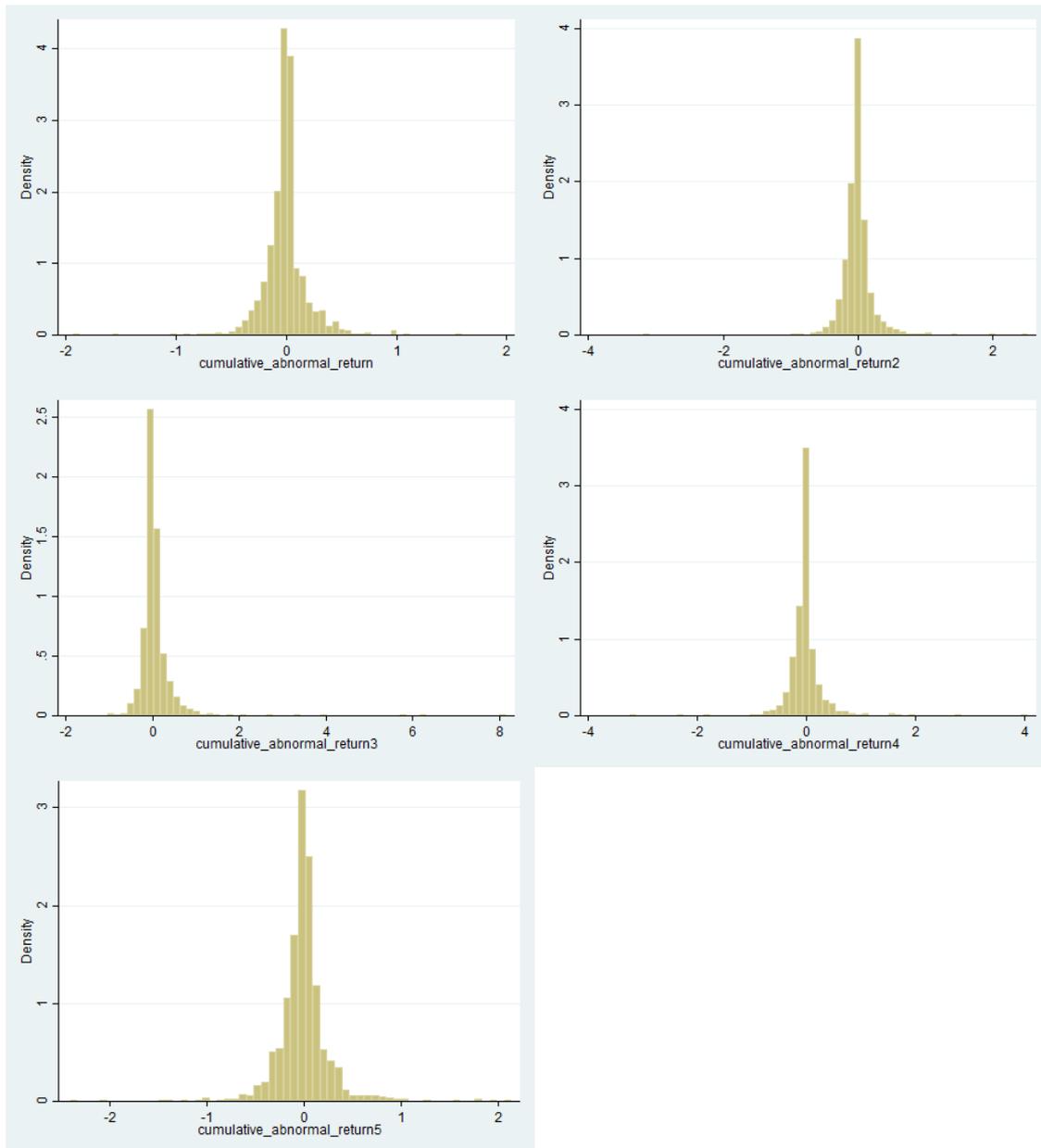


Figure 3. Distributional plots: Cumulative Abnormal returns for mining companies. Event 1 - 5.



8.3 Appendix C. Full list of considered events

Table 11. Full list of considered events

Event	Date
Stephen Harper announces increased action against corruption	12 Jun 2013
The official signing of G8 Lough Ern declaration	18 Jun 2013
The official release of the ESTMA rules	16 Jan 2014
The first reading of the bill containing ESTMA in parliament	23 Oct 2014
The bill containing ESTMA passes the final vote in parliament	10 Dec 2014
The bill containing ESTMA receives royal assent	16 Dec 2014
Official implementation	1 June 2015