



***The Cost and Benefits of Management
Certification of Financial Reports***

**A report prepared for the
Ontario Securities Commission
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Introduction and Summary of Findings

The Enron and WorldCom accounting scandals touched off major changes to U.S. securities laws. These two scandals revealed that investors in even the largest American firms, audited by the biggest of the accounting firms, were not immune from corruption at a scale to wipe out much, if not all, of the perceived value in a firm. Moreover, these scandals took place in a market that was already one of the most highly regulated in the world.

While detected cases of significant misstatement in financial reports is not very frequent, it is by no means unheard of, especially among smaller firms. A major difference with the recent scandals is their scale and the fact that those implicated—and eventually brought down—included a major accounting firm, Arthur Anderson. Canada has not been immune from such scandals. Livent and Bre-X are two noteworthy cases. However, the maximum market capitalizations of these firms were only fractions of WorldCom's maximum market capitalization. As a result, the Livent and Bre-X scandals had a lesser impact on North American markets. While these particular scandals did not cause the same impact as WorldCom and Enron, it might be argued that Canada's smaller market makes it even more important to guard against possible large-scale fraud. For example, at one point in time, the value of Nortel was close to one-third of the value of the Toronto Stock Exchange (TSX). In such circumstances, accounting irregularities could have a dramatic impact on Canadian financial markets.

In the aftermath of Enron and WorldCom, U.S. legislators and regulators have been trying to repair the damage to investor confidence by writing new laws and implementing new rules and regulations. The *Sarbanes-Oxley Act* (SOX) is the new U.S. legislation that is designed to restore investor confidence by making senior management more accountable, board of directors more independent, and auditors less susceptible to side payments. Securities commissions in Canada are now contemplating similar rules and regulations.

One of the regulatory changes that is being considered in Canada is the requirement that the chief executive officer (CEO) and chief financial officer (CFO) certify the material accuracy of financial information, including the management discussion and analysis (MD&A) contained in financial statements made to the public. Section 302 is the relevant section of SOX containing these certification requirement. Apart from some minor differences related to how



information is disclosed in Canada, the proposed national instrument for Canada is very similar to s.302 of SOX, both in form and implementation.¹

The proposed Canadian national instrument will require that the CEO and CFO attest to the material accuracy of information that the company releases to investors in interim and annual filings.² While officers of a company had a duty to provide accurate information to investors under existing rules, the new regulations make the extent of this duty explicit. Specifically, while the CEO and CFO of most companies cannot be aware of all the details in how the firm's data are collected and analysed to generate the materially relevant information for shareholders, they are still responsible for ensuring the existence and integrity of systems used to generate the information that is ultimately passed on to shareholders.³

This report provides an analysis of the potential costs and benefits of these new certification requirements to Canadians. The potential costs from these requirements are relatively clear – there are added internal costs to the firms and additional costs paid to outside advisors. In order to estimate these costs, we interviewed various industry participants, including interlisted Canadian companies that have had to comply with s.302 of SOX, and collected public data. Using the information collected we estimate the added time that CFOs and CEOs must take to review financial reports and the increased external costs that will be spent on auditors and lawyers. We then use publicly available data to calculate industry-wide costs from these estimates.

The potential benefits from the certification requirements are improved investor confidence leading to an improved financial system. In the extreme, a financial market with a reputation for widespread accounting irregularities will reduce the number of investors thereby raising the cost of capital to those firms seeking equity financing. While clear in principle, these benefits are inherently difficult to

¹ Certification of Disclosures in Companies' Quarterly and Annual Reports, Release no. 33-8124.

² Annual filings include the issuer's annual information form, annual financial statements and MD&A. The interim filings include the issuer's interim financial statements and interim MD&A. (See definitions in Multilateral Instrument 52-109, draft version 8.)

³ Items 4, 5, and 6 of the annual certificate (Form 52-109F1) and the interim certificate (Form 52-109F2) make explicit the responsibility of the CFO and CEO for the design and performance of internal controls and disclosure controls and procedures.



measure.⁴ Given their intangible nature, we are only able to quantify some portion of the potential benefits. For this exercise, we estimate the potential reduction in the incidence of significant misstatement in interim and annual filings and the value that this reduction would have for honest companies from reduced costs of capital.⁵

While we have employed techniques to quantify costs and benefits, it is very important to recognize several important *caveats* to our analysis. Our estimates and techniques, while sufficiently rigorous as to be preferable to back of the envelope calculations, should not be interpreted as precise or exact. The primary goal is to determine whether the benefits likely exceed the costs, and not to determine the exact value of any net benefit.

Quantifying costs or benefits of a regulatory policy aimed at reducing the incidence of significant misstatements is difficult for several reasons. First, the proposed instrument is designed to allow firms to choose the appropriate level of controls that the CEO and CFO (and the Board and audit committee) feel is appropriate to provide the new certificates.⁶ While we believe such a flexible regulatory approach is very useful for minimizing the regulatory burden⁷, it makes

⁴ The SEC only discusses at a very high level possible benefits and costs of the certification requirements in their final rules (Final Rule: Release No33-8124). They maintain that there are likely significant benefits from the certification requirements, but little concrete information is offered in support of this view. The apparent difficulty the SEC had in quantifying costs and benefits is not unique to the U.S. situation and we face similar difficulties. On the other hand, we do have the benefit of discussions with Canadian firms interlisted in the U.S. on how they have responded to the SEC regulations (s.302 of SOX) and their perceptions of likely benefits.

⁵ While certification requirements may affect the incidence of both minor and significant misstatements of financial results, much of our analysis is focused on more serious misstatements. Such serious misstatements are often referred to as fraudulent financial reporting in the U.S. We sometimes refer to fraudulent reporting and fraud when discussing misstatements in the context of U.S. research.

⁶ While we scale our cost estimates for firm size, we cannot account for other differences across firms, such as the sophistication of existing internal controls, which would result in different costs. Thus, our cost estimate range is based on expected average firm costs. Survey data would be needed to obtain more accurate cost estimates that take into account differences between firms. The limited time available to complete this analysis precluded conducting such a survey.

⁷ Indeed, one of the benefits of a less prescriptive approach is that it allows the firm to determine how to best meet the regulations based on the firm's particular circumstances. Firms have generally much more information about their individual circumstances than the regulator and therefore have an information advantage.



it more difficult to predict the operational steps that companies will take to implement the regulations—and hence the costs are more difficult to quantify.

Second, our bottom-up analysis of benefits is partially based on Ontario Securities Commission (OSC) data from continuous disclosure reviews. The data are useful in allowing us to estimate the relationship between expenditures on financial reporting and decreases in the incidence of misstatements. However, there is a range in the severity of the misstatements in the OSC data while our benefit analysis is focused on misstatements that are sufficiently significant that they would generally have a detectable and important effect on the stock price of a firm. Thus our inferences on the effect of increased accountability on reducing significant misstatements based on the OSC continual compliance reviews are somewhat indirect, though still appropriately scaled to the estimated incidence of more serious misstatements. In addition, we estimate the value of avoided misstatement through the certification requirements. While we have collected some evidence that suggests that the *cost* of a misstatement is of the same order of magnitude as the *size* of the misstatement, there is no obvious reason why the relationship between size and cost is one-to-one. *Thus any comparison of our estimated costs with estimated benefits should be qualified accordingly.*

Finally, our quantitative analysis implicitly assumes a level of enforcement that engenders the type of response exhibited by firms that must meet U.S. regulations. Section 906 of SOX imposes significant new criminal penalties including up to 20 years in prison. This has motivated CEOs and CFOs to take actions in response to s.302. The level of response to OSC and other Canadian securities regulators will depend on CEOs and CFOs' expectations of enforcement and the size of penalties. While our interviews did not suggest that market participants view enforcement in Canada to be significantly weaker than in the U.S. such that the firm responses to OSC certification requirements would be different from their response to SEC certification requirements, nevertheless, the response may be more significant in the U.S. than in Canada due to s.906. The effectiveness of the certification requirements in either country will ultimately depend on how the regulations are enforced.

Below, we summarize our findings.



Interview Findings:

- ?? Certification requirements would motivate many firms to undertake additional actions to meet such requirements, including increased attention by the CEO and CFO to financial disclosures, enhancing disclosure controls and procedures, and, especially for smaller firms, increased consultation with external auditors and lawyers. Still, most of the firms and industry representatives we interviewed do not view the certification requirements as unnecessarily onerous.
- ?? Large Canadian interlisted firms viewed the certification requirements positively. The increased costs are modest, while firms could realize benefits by having better information for senior executives to make decisions and by passing on any more accurate information to shareholders.
- ?? Smaller firms will face larger proportionate costs than large firms, as the CEO and CFO may need to consult outside expertise. However, small firms generally have simpler business models and more compact organizational structures that should allow most CEOs and CFOs to certify financial information without the need to make significant additional expenditures on internal controls—assuming such controls do not have to be auditable.
- ?? There is considerable variation between firms of the same size and industry as to the sophistication of internal controls that are in place. Some firms may decide to use the certification requirements as justification to upgrade internal controls, which would likely be at least a marginally profitable investment.
- ?? Most interviewees were sceptical of benefits from improved investor confidence. The overall view was that much of the benefits are through improved information for executives for decision-making as a result of greater attention to internal controls and disclosure controls and procedures.

Academic Literature Findings:

- ?? When firms choose to submit to more onerous disclosure requirements they experience an increase in stock prices, reduced bid-ask spreads and



greater share turnover. However, when regulations are imposed, some firms may find the costs outweigh the benefits.

- ?? Significant misstatements are especially prevalent among smaller firms and the size of misstatements are proportionally larger for smaller firms. However, significant misstatements occurs at all firm sizes, as the WorldCom and Enron scandals confirm, and the costs are significant for large firms. Better internal controls as well as setting the “tone at the top” are effective at reducing the incidence of misstatements, though they are not a panacea.

Cost/Benefit Findings:

- ?? Costs are likely to be relatively higher for smaller firms (Venture Exchange-listed) than larger firms (TSX-listed) relative to firm size (measured by assets). This is largely the result of economies of scale in auditing and governance that benefits larger firms.
- ?? We estimate the net present value (NPV) of industry-wide costs over a 10 year horizon to be \$120 million to \$143 million. This is equivalent to an increase of 2.8% to 8.2% in annual external audit fees. The upper cost estimate is less than 0.015% of total assets. In terms of cost differences between large and small firms, the increase in cost for Venture Exchange-listed firms is equivalent to a 5.0% to 14.9% increase in external audit fees and for TSX-listed firms it is equivalent to a 1.7% to 4.9% increase in external audit fees. However, when measured as a share of assets, average costs are two orders of magnitude larger for Venture Exchange-listed firms than for TSX-listed firms.
- ?? Due to the nature of benefits and data limitations there is considerable uncertainty in our benefit estimates. Nonetheless, we estimate the certification requirements could reduce the net present value of the expected amount of misstatements by anywhere from \$10 million to \$907 million.
- ?? The benefits of reduced significant misstatements are proportionately larger for smaller firms since the size of significant misstatements are generally proportionately larger. While the cost of misstatements cannot be directly inferred from the size of misstatements, the limited evidence



we have suggests that they are of a similar order of magnitude. The costs and reduction in the amount of significant misstatements are of a similar order of magnitude whether the firm is large or small.

?? We find that reasonable parameter estimates for the probability of significant misstatements, the size of misstatements (and their cost) and the effect of certification on reducing the incidence of significant misstatements put estimated benefits at a similar order of magnitude to estimated costs. In light of the fact that there are also other benefits, such as greater liquidity, lower market risk, and better allocation of resources that we are unable to quantify, we find that the benefits likely exceed the costs.

The remainder of this report is divided into three sections. Section 1 summarizes the results from our interviews. Section 2 provides an overview of the relevant academic literature and evidence in regards to regulated disclosure. Section 3 provides our analysis of costs and benefits. Section 4 provides a brief summary and conclusions. A technical appendix provides details of the calculations of costs and benefits.



1. Views of Market Participants

We interviewed company CEOs, CFOs and controllers as well as independent auditors, solicitors and member of industry groups who collectively represent both small and large businesses.⁸ A brief issues paper was sent in advance as background information and to focus the agenda. Most interviews were by telephone and took between 30-60 minutes. Interviews of those representing smaller organizations were focused on the CEO/CFO certification requirements, the equivalent of s.302 of SOX. In this section, we report the results of the interviews.

1.1 Costs of Compliance

In principle, firms should already have in place some level of disclosure controls and procedures as well as internal controls to provide materially accurate information to internal management, the board of directors, and investors. Thus, the level of controls required for certification should be the same as those required by the market, such that the certification requirements would require little or no additional effort or expenditures.

In practice, however, almost all those interviewed thought that most CEOs and CFOs would make some additional effort to review filings and internal controls in response to the certification requirements. Indeed, in response to s.302 of SOX, Canadian interlisted firms have refocused attention on disclosure issues. For example, the CEO and CFO, as well as other managers, are spending additional time reviewing disclosure documents prior to their release. Thus, the U.S. codification of the existing implicit requirements for sufficient disclosure controls and procedures to investors already has had some effect on interlisted companies.

Large Company Respondents:

Several larger companies described how, in response to s.302, they have set up a short conference call between senior management and regional managers prior to the release of quarterly and annual filings to discuss whether any changes to disclosure requirements are necessary. One company reported that on several

⁸ In particular, we interviewed 2 CEOs, 3 CFOs, 2 Controllers, 3 auditors and 2 solicitors of 10 different organizations. We contacted 18 different individuals to obtain the 12 interviews we conducted.



occasions these meetings have led to revisions to the MD&A, though they have not led to changes to the financial statements.⁹ In contrast, another company noted that it had already set up extensive internal controls following the Committee of Sponsoring Organizations of the Treadway Commission (COSO) framework¹⁰ and thus required no additional effort or expense to meet s.302. Between these two extremes, our interviews indicate that many companies are not as far advanced as this respondent, and hence they will likely want to take some additional steps to reduce the perceived increase in liability for CEOs and CFOs.

The general view among the larger firms interviewed is that the total costs of certification of financial statements by CEOs and CFOs (s.302 of SOX) will be small relative to, say, their existing costs of preparing audited financial statements. For these larger respondents, a few additional hours of CEO and CFO time to review internal and disclosure controls, along with a few hours of additional staff time are all that is required.

Small Company Respondents:

In contrast to large companies, the organizational structure of small companies is necessarily compact and relatively simple. As a result, the CEO and CFO are more likely to have good information as to what is going on in most parts of the company, and hence sophisticated internal controls may not be required. However, many CEOs and CFOs of small companies do not have substantial experience dealing with regulatory matters. Given their general risk aversion and lack of information and experience, respondents felt that it is likely that many small-company CEOs and CFOs will need to seek outside advice from auditors and lawyers before making the certifications, thereby incurring additional costs.

A CEO of a small company thought that he would be willing to make the attestations required by the certifications without any additional effort or expenditures. However, he also thought that many CEOs and CFOs in other

⁹ A practice more generally has developed in response to certification requirements whereby CEOs and CFOs are requesting lower officers to sign supporting “shadow certificates”. Whether the CEO and CFO could rely on these if legal action arose is unclear (see http://www.realcorporatelaw.com/CEO_Certifications%202.html).

¹⁰ See the Committee of Sponsoring Organizations of the Treadway Commission (COSO), *Internal Control – Integrated Framework*, 1994.



small firms with less familiarity with accounting and regulation would seek outside advice.

Most firms, large and small, will devote several hours of additional time by the CFO and CEO to review filings. For some firms, much of this cost will be offset by the value of better CFO and CEO understanding of the firm's financials. There may also be modest increases in the salaries of CFOs and CEOs of smaller-firms and some increase in the cost of Officers and Directors (O&D) insurance, to reflect the greater personal risks associated with new regulations.

Information that can be provided by the OSC regarding the specific actions necessary to meet any new certification requirements would be especially useful to small firms, to help them deal with the additional cost burden without having to engage outside experts.

1.2 Views on Benefits

A general view among those we interviewed is that there is significant variation between firms in terms of the level and sophistication of internal controls, even between firms of similar size in the same industry. Among large firms, some have sophisticated internal controls in place but our auditing contacts suggested that many do not have the degree of control over financial information generated by a complex system of multiple business units that would be sufficient for the CEO and CFO to feel comfortable signing the certifications.

A common perception is that many firms have internal controls below optimal levels in the sense that the costs of improving internal controls were lower than the benefits that would accrue to the firm. One reason offered for why such profitable investments in internal controls might not have already been made is that it is difficult for management to quantify the benefits and make a case for enhanced controls to shareholders. This view suggests that for at least some firms there may be net gains strictly from the improvements in running their businesses. One auditor reported that for three companies that were enhancing internal controls to meet SEC regulations, two were willing to only meet the minimum requirements while one was willing to go beyond the minimum requirements.

Our interviews also suggested that some rapidly growing firms would simply be accelerating the implementation of certain enhancements that they would have had to make in any case. These companies may have already been at or near the



stage where their added complexity and size necessitated more elaborate internal controls for business reasons. Small companies that have grown quickly through acquisitions may benefit substantially from imposing a degree of uniformity across the firm in internal controls and reporting practices. Others, however, view the additional requirements, especially in regards to s.404 of SOX, as an additional regulatory burden whereby they would do the minimum needed to meet the regulations.¹¹

The range of opinions is not surprising. As firms grow and become more complex, management must put into place more sophisticated internal controls and disclosure controls and procedures in order to maintain control over the company and in order to keep investors adequately informed. Firms that fail to do so will become less profitable and shareholders will start discounting the price of a firm's stock if they do not think they receive accurate financial information. For firms about to increase the sophistication of their controls, the new regulations appear to be less burdensome. For companies that are a long way away from making substantial changes in their internal controls, the new regulations are seen to impose a potentially large cost.¹²

Representatives of large firms generally thought that, despite some modest increase in cost, the certification requirements are desirable and that, for those firms that have made changes, the internal company benefits recover much of the modest increase in costs. The certification requirements would generally lead to some improvements in the accuracy of disclosures as incentives to slightly "colour" or put a positive "spin" on filings would be reduced as would minor instances of misstatements originating at lower levels within the organization.

Some representatives of smaller firms share the same perspective that the certification requirements would generate benefits for the firms internally. However, this view was not unanimous among representatives of smaller firms,

¹¹ Section 404 of SOX requires the firm's auditors to attest to the firm's internal controls. While many firms have internal controls, these may not be easily auditable, and hence investments have to be made to alter internal controls to allow for their auditing. In addition, there are significant ongoing costs to actually performing the audits of internal controls.

¹² While difficult to draw any conclusive inferences from the information provided, the finding in the Foley Lardner study that midcap U.S. firms were incurring the higher increase in audit fees suggests that some of these firms may be making additional changes in their internal control systems compared to small or large cap firms in response to SOX. That is, they may be accelerating their changeover to the more sophisticated controls used by large cap companies.



with some questioning whether there would be much benefit for the firms or their shareholders.

The auditors we interviewed had a mixed response as to whether the OSC and other Canadian regulators should follow the U.S. in implementing s.404 of SOX. While the majority of auditors interviewed agree with firm representatives that there are few benefits and enormous costs from s.404, there was concern that Canada will need to implement some version of it or it may risk losing high quality capital to U.S. markets. One auditor recommended that the OSC move quickly to implement critical elements of SOX in order to avoid any perception of weaker regulation in Canada from developing.

While they saw some private benefits from improved internal controls and additional CEO and CFO attention to filings, most interviewees believe there will be few broad social benefits from either a reduction in the incidence of significant misstatements or improved investor confidence. Part of the difficulty in seeing any benefit from a reduction in significant and deliberate misstatements seems to lie in the scale of the effect; most respondents thought that such misstatements (commonly referred to as fraudulent reporting) involved a very small percentage of individuals (under 1%). Thus, the benefits of reducing such misstatements are perceived to be small, and in no way sufficient to offset the significant drop in the markets (i.e., to restore investor confidence). The interviewees also thought that many of the social benefits are intangible and hence difficult or impossible to quantify.

Some interviewees thought that the incidence of significant misstatements may be reduced somewhat by the increased perceived liability on CEOs and CFOs, though most respondents thought the very small share of unethical managers would not care or respond to increased expected costs of unethical behaviour.

The accountants and executives we interviewed indicated that the impacts on behaviour or certification requirements depend on the penalties from non-compliance. In the U.S., s.906 of the SOX, which imposes significant new criminal penalties (including up to 20 years in prison), has created sufficient liability risk for CEOs and CFOs that they along with their audit committees are willing to make considerable expenditures to enhance their internal controls. Whether expected sanctions by the OSC will give rise to the same level of response in Canada is unclear, but the general view was that since being granted



self-funding powers, the OSC is considered to be much more interested and capable of enforcing its regulations than it appeared to be historically.¹³

Several interviewees suggested that Canadian firms (not listed in the U.S.) would be forced to implement the same level of internal controls in Canada as those required in the U.S. regardless of the Canadian requirements. While this line of argument is intuitively appealing, it is subject to criticism. In particular, outside investors only observe if the company has made the certifications and not the level of internal controls that have been implemented. If companies in Canada face lower expected costs of being out of compliance, because of smaller penalties or weaker enforcement, then each company has an individual incentive to lower its expenditure on enhancing internal controls. The value of the attestation in terms of lowering the cost of capital is then also reduced. Investors who only observe compliance with a certification requirement under weaker enforcement would not reward a company that implemented internal controls that met a higher standard. (Of course, investors would indirectly reward the firm if more stringent internal controls led to improved business performance, but this is not related to regulations *per se*.) That is, outside investors cannot easily verify that the firm has implemented more enhanced internal controls. In this case, the firm may have to list in the U.S. as a means to commit to a more onerous regulatory standard. As we discuss in the benefits section below, there is empirical evidence of German firms choosing a more onerous set of regulatory requirements for the reward of lower capital costs.

¹³ One interviewee thought that the OSC has gone too far in enforcing its regulations. Several commented on the importance of making examples out of those caught engaged in significant fraud.



2. Academic Research on the Regulation of Disclosure

The information gap between company insiders and outside investors goes to the core of many regulatory, auditing and corporate finance issues. As this *information gap* or *asymmetric information* problem is fundamental and its effects intangible, measuring the benefits from incremental improvements in disclosure is complex and difficult. In this section we discuss the potential sources of benefits of improved disclosure and review some of the recent academic research into the value of improved disclosure.

The central role of public capital markets is to provide access to financing from outsiders and to provide insiders with greater opportunity to sell some of their stake in the firm (i.e., greater liquidity). Transactions between insiders and outsiders, however, are complicated by the fact that the insider of the firm is likely to have more information about the value of the firm. As a result the prudent outside investor will be worried that he or she is more likely to buy shares when they are overvalued. That is, the insider with better information will be more willing to sell shares when outside investors have overestimated the value of the firm and the outside investor will take this into account.¹⁴ This type of problem arising from information asymmetries is known as *adverse selection*.

The second problem, known as *moral hazard*, arises when the insiders are part of management and thus also have considerable influence over the value of the firm. As management reduces its stake in the firm through sale of shares or dilution, the incentive to exert effort to increase firm value is weakened. To counteract this management will often retain a stake in the firm greater than would otherwise be optimal from the standpoint of holding a diversified portfolio [Leland and Pyle, 1977]. Management, especially the CEO, will also be given considerable incentive pay in the form of bonuses that are closely tied to various metrics of the company's performance, especially those where management can exert influence.

Myers and Majluf [1984], Ross [1977], Jensen and Meckling [1976] and Leland and Pyle [1977], were among earlier academic contributors to the understanding of the role of asymmetric information in corporate finance. They recognized that information asymmetries between insiders and outsiders may ultimately hurt the

¹⁴ The same issue can arise in debt issuances, but other mechanisms, such as securing the debt with tangible assets and loan covenants, help mitigate the problem.



insiders if it forces them to take costly actions to reassure the outsiders that the investment is valuable and fairly priced.

In the case of potential misstatements of financials, the insiders may have to discount the price of shares to compensate the outside investor for this possibility even when the insiders are making accurate reports. The reason is that outside investors cannot easily distinguish between an accurate report and a fraudulent report prepared by unscrupulous insiders masquerading as those making accurate reports.

Asymmetric information may also increase the incidence of misstatements originating at levels below senior management above optimal levels. Senior managers can reduce the likelihood of subordinates' reporting misstated results by enhancing internal controls. But, since outside investors cannot easily observe and verify the level of internal controls, senior managers may find it more profitable to underinvest in internal controls in the hope that investors will not detect any misstatements that they themselves are not able to detect. That is, with insufficient liability for fraud, senior managers may choose a lower level of internal controls to increase the apparent value of the firm (if only through avoided expense of upgrading controls), thereby enhancing their short-term compensation, which is tied to the current estimated value of the firm. While misstatements can not sustain firm value indefinitely (even when not detected directly), senior managers may have left the firm well before this occurs.

While the above arguments are theoretical, the current academic work in accounting and corporate finance is largely focused on detecting and measuring the effects of asymmetric information and how different regulatory regimes affect information asymmetries and market economics. For example:

?? Bushee and Leuz [2002] investigate changes in the SEC disclosure requirements for the OTC Bulletin Board. All firms trading on the OTCBB had to provide SEC disclosure filings starting in 1999, which was a significant increase in reporting requirements. Bushee and Leuz found that firms that complied with the new regulations (remaining on the OTCBB) experience a permanent increase in liquidity and realized abnormal positive returns whereas the reverse is true for non-compliant firms forced off the OTCBB. They also found, however, that 74% of firms chose not to comply with the eligibility rule. Thus, a majority of firms found that the costs outweighed the benefits.



- ?? Leuz and Verracchia [2001] examine changes in market economics for German firms that chose to switch from German reporting requirements to a more rigorous international reporting regime (IAS or U.S. GAAP). Leuz and Verracchia find that committing to increased disclosure results in lower bid-ask spreads and higher trading volume, consistent with reduced information asymmetry between insiders and outsiders.¹⁵ In particular, they find that switching to international reporting results in an average reduction in the bid-ask spreads of 35%, and share turnover increases by more than 50%. Also, it is the *ex ante* commitment to enhanced disclosure that matters; additional *ex post* voluntary disclosures have little effect on bid-ask spreads or turnover.
- ?? Kothari [2001] provides an overview of the role of financial reporting in reducing overall risk in the market. Building on the work cited above, Kothari discusses the literature on international differences in corporate law and, in particular, the differences between common law and code (civil) law.¹⁶ Kothari argues that in common law countries, protection through shareholder litigation and bankruptcy laws will generate high-quality public disclosure regardless of the regulatory standard. It may be advantageous to avoid mandating too high a standard so that disclosure requirements may be customized for different firm needs. Kothari's argument is compatible with the proposed certification requirements in that the requirements do not prescribe required internal controls or disclosure controls and procedures but instead prescribes the outcomes.

The recent empirical research suggests strong links between disclosure controls and the extent (and hence the cost) of asymmetric information. The Leuz and Verracchia investigation of German companies also highlights how differences in disclosure regimes can cause companies seeking to signal higher quality to choose a higher quality regime. This could suggest that if Canada does not closely follow

¹⁵ Their results control for the fact that firms choose to adopt an international reporting regime and thus may have different (unobserved) characteristics from other firms (i.e., the problem of self-selection).

¹⁶ LaPorta, Lopez-de-Silanes, Shleifer and Vishny [1997] have examined how increased protection afforded to outside investors in common law countries has resulted in more diffuse shareholders and separation of ownership and control since agency problems are less acute. Other research [Bhattacharya, Daouk, Jorgenson, and Kehr 2000] has examined how the threat of litigation as a credible signal of enforcement of shareholder protection laws is more important than the laws themselves.



the SOX changes in the U.S., more high-quality firms may choose to submit to SEC regulations only or largely as a signal of quality. The potential danger is that Canadian firms that choose to be regulated only by Canadian securities commissions may be perceived as higher risk firms resulting in a higher cost of capital.¹⁷

Some of the empirical results discussed above suggest that reducing information asymmetries can generate economically significant gains. Other studies have shown that market penalties associated with revelations about actual misstatements are significant. These studies include the following.

?? Callen and Morel [2002] examine the effect of the Enron-Anderson debacle. In particular, they analyse whether the loss of reputation for Anderson led to significant abnormal declines for other Anderson audit clients compared to non-Anderson clients on various event days. There is evidence of a cumulative negative impact (across all event days) of about a 4% loss in firm value for Anderson clients and no statistically significant impact for non-Anderson clients.

?? Karpoff and Lott [1993] investigate the effect of criminal fraud on firm value. While they look at fraud in general, for the 11 cases of financial disclosure fraud in their sample of frauds reported by the *Wall Street Journal*, they find a statistically significant drop of 4.66% on the initial report of the fraud. Similar evidence is found in Alexander [1999].¹⁸

In sum, the academic research and interviews suggest any benefits of enhanced disclosure may accrue to a number of different market participants manifested in different ways. These include:

¹⁷ Exercises in extrapolating from one situation to another should be considered with great caution. The positive economic results obtained in the German case—moving from relatively loose standards to international norms—do not necessarily imply that moving from current international norms to a more regulated environment will generate further gains.

¹⁸ We use this estimate of the impact of misstatements on firm value in calculating benefits in the next section. The 4.66% may be conservative, as Karpoff and Lott do not address the possibility of information leakage of the fraud prior to its report in the *Wall Street Journal*. The Callen and Morel finding of a 4% loss of value for firms that are not accused of fraud but are just associated with an accounting firm accused of fraudulent behaviour also suggests that the 4.66% reduction for actual fraudulent behavior may be conservative. On the other hand, the Callen and Morel finding is only marginally statistically significant.



1. Improved liquidity and lower bid-ask spreads in markets for firms with improved disclosure—benefits that accrue to both companies and investors.
2. Overall greater investment in internal controls. This results in a reduction of misstatements and other fraudulent behaviour in the firm, and it may provide additional information for management decision-making—both of which benefit current shareholders and debtholders.
3. A reduction in the expected risk of misstatements associated with all companies—benefits that accrue to investors in the form of a less risky portfolio and to companies in the form of a lower cost of capital. These benefits will be manifested in an increase in the market value of firms' debt and equity. A reduction in overall market risk as improved disclosure provides investors with better information about the expected value of firms. Less effort is required by the market (i.e. analysts) to uncover additional information.
4. Reducing the likelihood that firms regulated by the OSC are considered to be of lower quality and higher risk compared to firms that choose to be regulated by the SEC. It thus reduces regulatory costs for Canadian firms that would comply with SEC regulations only or largely as a means of signalling more accurate public disclosures.

Board members and audit committee members also benefit as the CEO and CFO take greater responsibility for accurate disclosures. Some of these benefits will be passed on to shareholders in the form of lower compensation for these committee members.

An important further benefit of the certification requirements accrues to the shareholders of individual firms through increased value of the firm. As discussed above, representatives of several interlisted firms who we interviewed told us that their firm did benefit from increased internal efforts by the firm in response to s.302 of SOX, offsetting much of the cost.

In the quantification section below, we only attempt to quantify the benefits of reduced capital costs. This does not imply that the other sources of benefits are smaller; rather they are more difficult to quantify. Thus, the benefits that we quantify will understate the total potential benefits.



3. Estimates of Costs and Benefits

We draw heavily on information from the interviews to estimate costs. Our approach for estimating the costs of the certification requirements is to estimate the cost of additional CEO and CFO time, an increase in CFO salaries and an increase in external audit fees. We use somewhat different assumptions to calculate costs for firms listed on the TSX and firms listed on the Venture Exchange to take into account the additional costs that small firms may pay for external assistance as indicated by our interviews. As there is variation across firms in terms of their existing level of internal controls and disclosure controls and procedures, ideally costs would be estimated after obtaining survey data from a broader selection of firms. As there was not sufficient time to conduct a broad industry survey, we rely on results from our interviews to form a range of estimates of the parameters used to calculate costs.

In terms of benefits, the interviews were useful in providing qualitative information but they did not provide us with the information necessary to quantify benefits. Instead, we collected other information, such as the frequency and magnitude of misstatements, in order to quantify some of the benefits. Our general approach is to estimate how much the incidence of significant misstatements would be reduced as a result of the regulations. We then determine how much value this reduction in significant misstatements would create. Given the limited time and limited data available, a number of assumptions are necessary to derive estimates of benefits. This introduces added uncertainty into the final estimates. However, even with more time and data, we expect there would remain substantial uncertainty in respect of any quantification of potential benefits given their inherent complexity. We describe our methodology for quantifying potential benefits in detail in the appendix.

As noted above, we are unable to quantify all potential benefits, which implies that our net benefit calculations are conservative notwithstanding the inherent uncertainty in the quantification exercise. Estimating benefits is difficult due to their intangible nature. Firms themselves find it difficult to measure benefits to their own shareholders from better internal controls—several interviewees cited this as a reason why upgrading internal controls can become a low priority.

The evidence from interviews, academic research and cost and benefit calculations collectively indicate that the overall net benefits of the CEO and CFO certification requirements are positive.



As mentioned above, our calculations of net benefits take into account differences between large and small firms.¹⁹ In general we find the costs of CEO and CFO certification to be proportionally larger for smaller firms. This is partially due to the fact that larger firms can take advantage of economies of scale in auditing. In addition, the opportunity cost of CEO and CFO time is higher for smaller firms when scaled to the firm size. However, the scaled benefits for smaller firms are also larger. The expected cost of misstatements is proportionately larger for smaller firms and so the additional efforts the certification requirements generate to reduce misstatements results in a larger impact on smaller firms. Thus, *provided the certification requirements are enforced sufficiently to generate the reductions in significant misstatements that we have assumed*, shareholders should be generally willing to provide capital to smaller firms at sufficiently lower cost to offset the added costs imposed by the regulations.

While the cost-benefit analysis supports the notion that added efforts to improve internal controls and disclosure controls and procedures should lead to an increase in the value of firms and a reduction in the cost of capital, it is not the case that private incentives alone would yield the same benefits. Since it is difficult for outside investors to determine the level of enhancements to internal controls and disclosure controls and procedures on a company-by-company basis, they cannot easily reward companies that implement such enhancements. This results in investments in internal controls and disclosure controls and procedures below what would be privately optimal for firms if outside investors could easily observe the levels of internal controls and disclosure controls and procedures in place.²⁰ The certification requirements, to the extent they are enforced, should cause the majority of firms to enhance their internal controls and, in particular, disclosure controls and procedures so that investors will lower their assessment of the probability of misstatements and concomitant loss in firm value for outsiders

¹⁹ It is particularly important to distinguish between small and large firms in the context of Canadian regulation. For instance, based on data from Bloomberg, firms listed on Canadian exchanges with assets below \$10 million make up 24% of the total number of firms listed on Canadian exchanges while in the U.S., the percentage of these very small firms is about 1.5%.

²⁰ This does not mean that investors have no idea of the level of internal controls in place. A firm with very poor controls will not be run efficiently and this will show up in terms of lower profits, which investors are better able to monitor. The auditor under existing regulations also audits internal controls deemed necessary to generate financial reports. And some firms in fact have very sophisticated internal controls and disclosure controls and procedures in place and will not feel it necessary to respond to certification requirements by enhancing these. Many others, however, will make some enhancements.



through fraudulent transfers of wealth (direct and indirect) to insiders.²¹ A lower *overall* probability assessment of misstatements increases the expected value of all firms. This results in higher value for existing shareholders (except for those previously benefiting from misstatements) as well as reducing the cost of new capital.

The representatives of medium to large firms we interviewed were generally in agreement that the certification requirements should only require a modest amount of additional CEO and CFO time and perhaps some additional staff time. Some firms with very poor internal controls might decide to make significant investments to upgrade these controls. However, those we interviewed suggested that much of this upgrading cost would be offset by benefits to these firms in terms of better information and better control by management over the organization.²²

Unfortunately, without survey data we are unable to determine what percentage of firms would respond to the certification requirements with major upgrades to internal controls that they would not otherwise have made. Given that firms were already required to have systems in place to provide materially accurate information to investors one would expect the share of such firms to be small. Indeed, none of the representatives of firms we interviewed said they would make

²¹ Many we interviewed thought that most investors were not sophisticated enough or had the interest to make use of the information released by firms so that the certification requirements would have little effect on investor confidence. However, it is not the case that most investors make direct use of this information or account for the improvement in the quality of the information for the certification requirements to have an effect on markets. One reason is that the market provides simplified information through analysts for both sophisticated and unsophisticated investors. Second, much of price formation is driven by sophisticated large investors, such as institutional investors and mutual funds, so that better quality information can be impounded into stock prices through these sophisticated investors. For instance, a McKinsey and Company [2002] survey of institutional investors found that these investors put corporate governance on par with financial indicators when evaluating investment decisions and would pay a premium (12 to 14% in North America) for companies exhibiting high governance standards. (Canada induced the smallest premium of all 31 countries, suggesting that good governance and high ethical standards are prevalent in the Canadian system. The U.S. ranked seventh.) Moreover, financial disclosure was considered a pivotal concern and the quality of market regulation and infrastructure is seen as highly significant.

²² Arguably, if such investments are required to provide reasonable assurance that publicly disclosed information is materially accurate then these investments already should have been made. While a reasonable point of view for the OSC and other commissions, we would ideally like to measure the cost and benefits as they arise in practice rather than in theory.



or, in the case of s.302 of SOX, had made substantial investments in upgrading internal controls in response to certification requirements.

3.1 Costs

There are three components to our cost calculations:

- ?? An increase in internal hours spent by the CEO and CFO;
- ?? A small increase in CFO salaries; and,
- ?? Increased expenditures on auditors and lawyers.

We value CEO and CFO time based on salaries without bonuses since the opportunity cost of the time spent on disclosure is unlikely the forgone time spent on activities generating high value for the firm that justify the bonuses.

As central estimates we assume CEOs and CFOs of small firms (those listed on the Venture Exchange) spend an additional four hours per quarter reviewing quarterly disclosure filings plus an additional four hours to review year-end disclosure filings. In the initial year we assume an expenditure of 10% of current audit fees on additional audit and legal advice.²³ We assume a further 5% more in audit fees per year for ongoing advice.²⁴ Finally, we assume an increase of 0.5% in CFO salaries.²⁵ Not all small firms are likely to require expenditures at this level. Our interviews suggested that some CEOs and CFOs of small firms would feel comfortable signing the disclosure documents without any additional internal effort or expenditure on outside experts.

For TSX-listed companies we assume that CEOs and CFOs devote the same 20 hours a year of additional time to review filings prior to their release. We assume a smaller salary increase for the CFO of 0.2%. (The representatives of larger

²³ By contrast, to set up auditable internal controls as per s.404 of SOX would require expenditures on the order of 100% to 300% of existing audit fees.

²⁴ As compared with 15 to 100% expected ongoing costs to comply with s.404 of SOX.

²⁵ This increase is very small, but the incidence of reporting fraud we estimate to be only 0.36%. The CFO can mitigate his or her exposure to risk through better internal controls and attention to financial reporting as implied in the other cost assumptions. Thus a 0.5% increase in salary is likely on the high side even for a risk adverse CFO. (The increase in the CFO salary is a real economic cost in the sense that the CFO is exposed to additional regulatory risk that cannot be reduced to zero.)



firms did not generally feel that salaries would change at all in response to the legislation.) Based on our interviews, most large firms should not face substantial set-up costs or increased ongoing audit costs. We estimate a set-up cost of 5% of existing external audit fees and an ongoing cost of 1% of audit fees.

By using shares of existing audit costs, our cost estimates are appropriately scaled for the size and complexity of the firm. This is consistent with the notion that the new regulations are not intended to prescribe what internal controls are needed, only the outcomes that need to be achieved. To translate the above percentage increases into actual dollar amounts, we first estimate salaries and audit costs and then apply the percentage increases. We do this for a sample of firms and then extrapolate to all firms listed on the TSX or Venture Exchange but that are not interlisted.²⁶

To estimate salaries and audit fees we undertook the following steps:

1. We hand collected data on CEO salaries, audit fees and assets for a random sample of TSX and Venture Exchange companies from their proxy circulars available on SEDAR. With this information, we estimated the relationship between firm size and audit fees and the relationship between firm size and CEO salary. (A log-linear regression is used in both cases. The details of the estimation are provided in the appendix.)
2. We use the regression coefficients to predict salaries and audit fees based on asset values for all firms for which we were able to collect asset data from Bloomberg. The Bloomberg data represents about 50% of the TSX non-interlisted company population and about 10% of the Venture Exchange company population. We tested to see if there was a selection bias in Bloomberg in the companies reported using our random sample of hand-collected data and found that after controlling for exchange there was no bias.

²⁶ We have assumed that all interlisted firms are listed on a U.S. exchange and are therefore subject to SEC regulation and exempt from the proposed Canadian certification requirements.



3. We calculated costs based on the assumed percentage increases above, using a real discount rate of 5% to compute the net present value of costs over a 10 year horizon.²⁷
4. We grossed up to industry level costs using the ratio of the size to the total population to the Bloomberg size.

Below, Table 1 shows cost ranges assuming a 50% variation in each of the underlying assumptions (e.g., hours per quarter). The costs for Venture Exchange firms are equivalent to a 4.95% to 14.86% increase in existing external audit fees. For TSX-listed firms the cost increase as a percent of existing external audit fees are between 1.65% and 4.94%. When measured as a percent of assets the costs for Venture Exchange firms range from 0.32% to 0.95%. For TSX-listed firms the costs are considerably smaller (two orders of magnitude) than those for Venture-Exchange-listed firms when measured as a percent of assets. The much higher cost burden for small firms reflects the much higher CEO and CFO salary cost and external audit cost as a percent of assets for smaller firms. Total industry costs are on the order of \$120 to \$361 million calculated as an NPV over 10 years, or between \$14 and \$43 million per year (based on a 5% real discount rate). Relative to total assets, these costs are small in magnitude (less than 0.015% of total assets).

²⁷ We assume a 7% nominal discount rate based on the average long bond rate over the past decade and a 2% inflation rate (the middle of the Bank of Canada's target inflation range of 1 to 3%). In terms of benefits, one might argue that the payoffs are proportional to the value of equity and thus the discount rate should be higher than that applied to costs. However, the COSO study of fraudulent reporting found that frauds were more likely to occur when a firm was performing poorly. This would suggest that reducing fraudulent reporting adds value most when the market overall is performing poorly. This in turn implies a low, potentially negative correlation in the payoffs from reduced fraudulent reporting and thus suggests a lower discount rate is appropriate. We thus use a 5% real discount rate for both costs and benefits.



Table 1: Cost Ranges for Non-Interlisted Firms (\$ millions)

| | Short-Term Transition (first year) | Long-Term Recurring (per year) | NPV |
|---|---------------------------------------|-----------------------------------|---------------|
| <i>Venture Exchange</i> | | | |
| Internal Time | | 2.7–8.1 | 22.4–67.2 |
| CFO Salary Increase | | 0.5–1.6 | 4.5–13.6 |
| External Costs | 8.8–26.3 | 4.4–13.1 | 45.1–135.3 |
| Total | 8.8–26.3 | 7.6–22.9 | 72.1–216.2 |
| As a Percent of Existing External Audit Fees* | | | 4.95%–14.86% |
| As a percent of Assets | | | 0.32%–0.95% |
| <i>TSX</i> | | | |
| Internal Time | | 2.7–8.0 | 22.1–66.4 |
| CEO and CFO Salary | | 0.3–0.97 | 2.7–8.0 |
| External Costs | 8.8–26.5 | 1.8–5.3 | 23.5–70.5 |
| Total | 8.8–26.5 | 4.8–14.3 | 48.3–144.9 |
| As a Percent of Existing External Audit Fees* | | | 1.65%–4.94% |
| As a percent of Assets | | | 0.002%–0.006% |

*Calculated as a percent of the NPV of recurring external audit fees over a 10-year horizon.

3.2 Benefits

Our approach to measuring benefits is to estimate the potential reduction of significant misstatements as a result of the regulations and then determine how much value, using one economic metric, this reduction in misstatements would



create. In order to do this we need to know the probability of misstatements, the reduction in this probability due to the increased internal efforts and external expenditures engendered by the regulations, and the cost of misstatements. In essence, we compute the expected value of avoided costs of significant misstatements.

Among a number of possible benefits from the certification requirements, this approach does not account for increased value to the firm from improved internal decision-making as a result of better information. It also does not account for benefits that accrue to many firms through slight improvements in the accuracy of information released to investors, which several interviewees cited as benefits that have come from s.302 of SOX. Only serious misstatements are accounted for in our analysis. Also, our approach measures the cost of misstatements as the amount by which firm value was overstated.²⁸ Our measured benefits do not include more intangible benefits such as a reduction in the probability that Canadian regulated investments become regarded as more risky than U.S. regulated investments and that more accurate pricing leads to better allocation of productive resources and lower overall aggregate market risk.

A study by COSO [1999] provides us with data for inferring the incidence of misstatements and its cost. The study found about 300 identified cases of fraudulent financial reporting over an 11-year period from Accounting and Auditing Enforcement Releases (AAERs) issued by the SEC. It also provides estimates of the total amount of misstatements. We scale the reported incidence of misstatements reporting to the Canadian market size. However, since these cases represent only detected misstatements we adjust the estimate using a fraud detection rate of 20%, based on an Ernst & Young study [2002]. This generates an estimate of the incidence of misstatements of 0.36% per year. We also use the COSO reported data as well as results from the Karpoff and Lott [1996] study to determine how the amount of fraud varies with firm size (based on assets). The estimate for a small firm (\$25 million in assets) is 26% of assets and for a larger firm (\$800 million in assets) the estimate is about 5% of assets. Details of the estimation are in the appendix.

²⁸ The presumption is that our measure of fraudulent reporting is equivalent to the insiders whose compensation is tied to firm value plus any fraudulently overvalued shares they sell to outsiders unaware of the fraud plus any real costs to the firm in terms of diverted attention from increasing value and outright theft of assets.



The COSO estimates include both misstatements and misappropriations. While misappropriations can be considered as a direct dollar cost, the translation of the value of misstatements to actual dollar loss to society is not straightforward. A misstatement showed value that never existed so the direct cost of the misstatement is in fact the fraudulent transfer of wealth to insiders that it supported and the misallocation of resources. These costs may be more or less than the value of misstatements. There are several reasons, however, to believe that actual costs are *at least* on the same order of magnitude as the size of the misstatements. First, the COSO study found severe consequences to financial fraud. In particular, it reports that 36% of companies involved in financial fraud went bankrupt or became defunct, 15% experienced a change in ownership, and 21% delisted from a national stock exchange (the sample included companies traded over the counter). The average fine paid by a senior executive was \$5.5 million, or about 20% of the total cumulative amount of misstatement.

Second, if one uses the COSO data to extrapolate to an average size cross-listed TSX firm, the estimated misstatement for these large firms is on the same order of magnitude as a reduction in firm value that would be needed to generate the 4.66% drop in stock price that Karpoff and Lott found when firms were reported in the *Financial Times* to be under investigation for financial reporting fraud. While we believe that it would be possible to conduct a rigorous analysis of the relationship between the value of misstatements and loss in firm value, this was beyond the scope of this study.²⁹

We used compliance data provided by the OSC to infer the relationship between expenditures by firms on improved internal controls and disclosure controls and procedures and reductions in misstatements. We estimated a regression model that linked the probability of refile (the most serious outcome in the data) following a compliance sweep to whether the firm was using a large audit firm or not, after controlling for size and industry effects. We find that using a large audit firm reduces the probability of misstatements from 0.19 to 0.12.

²⁹ Both Enron and WorldCom filed for bankruptcy due to financial reporting scandals. WorldCom's petition was the largest in U.S. history. Graham, Litan and Sukhtankar [2002] conjecture that the WorldCom scandal in 2002 can be associated with 10 and 24% loss in stock market value in the U.S. They estimate a loss in GDP output of between \$37 and \$42 billion in the first year.



In order to make use of this information we need to know the additional cost of using a big audit firm. Craswell, Francis and Taylor [1995] estimate that Big 8 auditors in Australia earn a 30% premium over non-Big 8 auditors. We combine this estimate with our regression results to compute a relationship (elasticity) between added expenditures and reduced probability of misstatements. This approach allows for diminishing returns to added effort in reducing misstatements – the same percent increase in expenditure is required to reduce the probability of misstatements from 0.36% to 0.18% as to reduce it from 0.18% to 0.09%.³⁰

One criticism of this approach is that we have inferred the relationship between expenditures and reduced serious misstatements using data on refilings that includes also more minor misstatements. The firms required to make refilings after a continuous disclosure review have not necessarily or even generally engaged in significant misstatements.³¹ Several of those we interviewed thought that misstatements supported by senior management would not be affected by the certification requirements. This would be problematic as the COSO report found that 83% of cases implicated the CEO or CFO in financial statement fraud. On the other hand, the CFO was only implicated in 43% of the cases so that joint liability would in some cases provide a check on CEO behaviour. Another COSO [1994] report on internal controls points out that management can always override the internal control system, but it also describes the importance of the CEO setting the “tone at the top” that affects others throughout the organization, including other senior executives.

As discussed earlier, the incentives and effectiveness of reducing misstatements perpetrated by a CEO or CFO willing to commit fraud under the right circumstances depends on the degree to which the perceived costs of getting caught have increased. In these cases, misstatements may be reduced without any additional expenditure; the increased liability for misstatements itself is sufficient to deter some of those involving the CEO or CFO. For most CEOs and CFOs that would not contemplate making misstatements under existing rules, the increased

³⁰ We assume that internal efforts to control fraudulent reporting have the same impact on reducing fraud as expenditures on auditors. Support for this assumption is found in Felix, Gramling, and Maletta [2001].

³¹ We analyse the stock prices of firms listed on the OSC website under “errors and refilings” to determine if there was a stock price impact upon the press release. We did not find statistically significant evidence of any effect. Probably the violations were generally seen as small by investors and thus it would take many more observations than our 19 to detect any effect.



liability is likely to translate into expenditures to reduce misstatements in financial results originating further down in the organization.

Our approach provides a relatively simple methodology for calculating a component of benefits. However, there is a great deal of uncertainty in the parameter estimates, which translates into uncertainty in measured benefits (as highlighted below in our sensitivity analysis). In order to capture that uncertainty, we have calculated benefits assuming a ±50% variation in three key parameters:

- ?? The misstatement detection rate;
- ?? The reduction in the incidence of misstatements for a given level of expenditure; and,
- ?? The current incidence of misstatements.

Table 2 presents the ranges of estimated benefits and lists other possible benefits for which there is evidence from the academic literature and the interviews but that we are unable to quantify. The quantified benefits show a significant range in values. Assuming it is appropriate to compare benefits expressed in terms of the NPV of dollar reductions in the value of misstatements with costs in terms of the NPV of dollars expended by firms to meet the certification requirements, we find that the range of these estimated benefits are of a similar order of magnitude of the estimated cost ranges.

Table 2: Estimate Benefits as a NPV (\$ millions and percent of assets)

| | Venture Exchange | TSX |
|-----------------------------------|----------------------|------------------------|
| Reduction in Misstatements | 3–244 0.01%–1.07% | 7–663 0.000%–0.027% |
| Improved-Internal Decision Making | N/A | N/A |
| Improved Market Liquidity | N/A | N/A |



4. Summary and Conclusions

In principle the executives of a firm are responsible for ensuring they have sufficient internal controls and disclosure controls and procedures in place that they are able to provide accurate information to the public. However, firms do not always meet this standard in practice and while elimination of all cases of misstatements is impossible (and inefficient), in many firms there is room for reducing the likelihood of significant or even minor misstatements. The certification requirements codify what is expected of CEOs and CFOs. Based on our interviews, this is likely to result in most CEOs and CFOs paying greater attention to the accuracy and reliability of publicly disclosed information. The extent of the response will ultimately depend on how the regulations are enforced. Our analysis subsumes a level of enforcement similar to what is expected by firms regulated by the SEC.

The incremental cost for most firms is expected to be modest. Large Canadian firms that are subject to SEC regulations have not generally found s.302 of SOX to be onerous. In fact, most find that the additional costs are at least partially (if not fully) offset by the benefits of better information for internal decision-making.

There is considerable variation across firms in the sophistication of internal controls, even for firms in the same industry and of a similar size. Some firms may use the certification requirements as a justification to make significant upgrades in internal controls. These larger investments are generally expected to be (at least marginally) profitable for the firm. Other firms, both small and large, have sufficient internal controls and disclosure controls and procedures in place that no added investments will be likely. We have estimated costs for a typical firm based on information from our interviews.

The individuals we interviewed, representing both large and small firms, were generally sceptical as to the impact of certification on compliance, with many believing that the behaviour of unethical managers would not be curbed by an increase in potential liability. Nevertheless, the academic literature has found evidence that firms that choose to submit to more stringent disclosure regulation realize benefits, including an increase in the stock price and greater liquidity. Several studies by COSO have found that better internal controls and setting the “tone at the top” can be effective at reducing the incidence of fraudulent financial reporting.



The costs and benefits are difficult to estimate precisely, for many of the reasons cited by the SEC in its discussion of the costs and benefits of certification requirements. The required response to the certification requirements will vary from firm to firm depending on, among other factors, the size of the firm, the type of industry and the level of internal controls and disclosure controls and procedures already in place. We control for firm size in our estimates, but not other differences between firms. Moreover, many of the potential benefits are intangible and thus difficult to quantify.

We estimate that costs are generally quite small. However, they will be proportionately larger for smaller firms. The larger cost for smaller firms reflects the higher opportunity cost of CEO and CFO time as well as higher audit fees as a proportion of the firm size. We also expect smaller firms will incur additional costs in additional consultation with auditors and lawyers. As well, the increased liability for CFOs may lead to a larger increase in CFO salaries as small public firms have to offer overall compensation that remains competitive with small private firms.

The academic literature provides some indirect evidence of improved benefits from enhanced disclosure, though it cannot be used to directly determine whether an increase in the regulation of disclosure in an already tightly regulated market would lead to an overall improvement in public welfare. Using a number of assumptions, we have estimated the expected reduction in the amount of misstatements. While there is no obvious reason that the reduction in the amount of misstatements should be in a one-to-one correspondence with the dollar cost of such misstatements, we do find evidence suggesting they are of similar magnitudes.

We find that for reasonable estimates of the underlying parameters, the reduction in the total amount of misstatements are of the same order of magnitude as costs. To the extent that the size of misstatements generates costs of a similar magnitude, the measured benefits from reduced misstatements are of a similar order of magnitude as measured costs. Furthermore, while costs are proportionately higher for smaller firms, benefits are also proportionately higher. The higher proportionate benefits for smaller firms are explained by the fact that the size of misstatements is proportionately larger for smaller firms, notwithstanding the Enron and WorldCom scandals. In addition to the benefits we have estimated, there are other benefits, such as increased liquidity and better



overall resource allocation from more accurate information that we have not been able to quantify.

When the totality of benefits – both those estimated and those that are not quantified – are taken into account, we find that the potential benefits likely exceed the potential costs.



Appendix: Theoretical and Empirical Foundation for the Benefits Estimation

In order to quantify benefits, we need a mathematical representation of the problem. An investor who is uncertain whether or not a firm is making a misstatement must form an expectation about the value of the firm. Experience tells the investor that, with some very high probability (near, but not exactly one), the firm is making an accurate report and, with one minus this probability, the report is incorrect (and possibly assets have been misappropriated).

Let V be the value of a firm where there is no misstatement. Suppose that in each year with probability p a misstatement occurs and existing shareholders lose F . The loss of F can be thought of as both a loss in assets from misappropriation and a fraudulent conveyance of value to managers such as by keeping bonuses (or their positions) that should have been lost if reporting had been accurate. An honest firm may never make misstatements, but outside investors cannot tell if a firm's managers are honest or not and so investors apply the probability of misstatements p to all firms, which reduces the value of the honest firm accordingly. The value of the firm to an outsider is then

$$\begin{aligned}V^e &= V - pF - pF/(1+r) - pF/(1+r)^2 - \dots \\ &= V - pF/r,\end{aligned}$$

where r is the discount rate.

We estimate the benefits by determining how much V^e would increase if the probability of misstatements fell from increased CEO and CFO liability. Let V^* represent the value of the firm with the new certification requirements in place and p^* represent the new probability of misstatements in a given year, then our estimate of benefits (B) is:

$$\begin{aligned}B &= V^* - V^e \\ &= (p - p^*)F/r.\end{aligned}$$

To calculate benefits we need an estimate of how p changes with added expenditures on internal controls, the level of p , and the effect of a misstatement on firm value.



We assume that the probability of misstatements is a decreasing function of the expenditure E on internal controls broadly defined to include monitoring efforts by senior management, enhancing internal controls, and consulting with outside audit and legal experts. In particular, we assume that

$$p = \frac{p_0}{E^\alpha}, \quad (1)$$

where p_0 and α are parameters to estimate.

Thus, the percentage decrease in the rate of misstatements is related to expenditures by the elasticity parameter α . There is an implicit decreasing returns to investment in internal controls embedded in the above in that as p approaches zero, each additional investment leads to a smaller absolute decrease in the probability of fraud. Ideally we would estimate the parameters p_0 and α from data. However, while we have useful data, it does not allow us to directly estimate (1). We discuss an alternative approach below.

Some algebra allows us to write the change in the probability of misstatements as:

$$\frac{p - p^*}{p} = 1 - \left(\frac{E^*}{E}\right)^\alpha.$$

We can then rewrite benefits as

$$B = \left(1 - \left(\frac{E^*}{E}\right)^\alpha\right) p F / r. \quad (2)$$

The final complication is that the proportional size of fraudulent reporting generally decreases with the size of the firm.³² To capture this effect we assume that the size of the misstatement is a function of the size of the firm measured in assets. In particular, we assume that

$$F = \beta V^\gamma, \quad (3)$$

where β and γ are parameters. We substitute this estimate into (2). As with the parameters governing the size of fraud, we unfortunately do not have a data set to

³² This was the finding of the COSO study on fraudulent reporting. The Enron and WorldCom scandals indicate, however, that in some cases fraudulent reporting among large companies can be proportionately as large as that in small companies.



estimate these parameters. However, we have several data points that we use to identify the parameters, as discussed below.

Using (2) we estimate benefits for each firm in our sample of non-interlisted TSX and Venture Exchange firms. For each group of firms, we gross up total benefits to the industry level by multiplying by the ratio of the number of total firms to the number of firms in our sample for the respective exchanges. Our estimates of the probability of misstatements are at an annual frequency. Thus our estimated benefits recur annually.³³

In order to calculate benefits we need estimates of the parameters in (2) and (3). To obtain an estimate of β we make use of OSC data from audits by the OSC of firm compliance with continuous disclosure requirements. The data set consists of 430 observations from compliance audits between 2001 and 2003. The data include the industry, the exchange the company is listed on, the auditor, and the firm size measured as asset ranges.³⁴ The data also provide 15 different categories in which a firm may be out of compliance. We focus on refilings, which are the most serious outcome of the continuous disclosure reviews. We estimate a logit regression to determine the relationship between the probability a firm will need to refile disclosure documents and whether the firm uses one of the big accounting firms as its auditor. We control for firm size and industry. The regression results are presented in Table A1.

³³ We have not accounted for the possibility that a firm committing fraud goes bankrupt and thus is no longer in the sample. New entrants would replace such firms – a necessary condition to ensure the stock of assets does not decline to zero.

³⁴ The ranges are: under \$5 MM; between \$5 MM and \$25 MM; between \$25 MM and \$100 MM; between \$100 MM and \$500 MM; between \$500 MM and \$1 billion; between \$1 billion and \$5 billion; and over \$5 billion.



Table A1: Logit Regression of the Probability of Refiling After a Continuous Disclosure Review

| Variable | Parameter Estimate | p-value |
|------------------------|--------------------|---------|
| Big Auditor | -0.63 | 0.1 |
| Over \$1 billion | -2.42 | 0.0 |
| \$100 to \$500 million | -1.71 | 0.003 |
| \$25 to \$100 million | -0.84 | 0.074 |
| \$5 to \$25 million | -0.82 | 0.091 |
| Financial | 0.27 | 0.68 |
| Technology | 0.15 | 0.713 |
| Resource | 0.74 | 0.185 |
| Manufacturing | 0.64 | 0.235 |
| Communications | 0.50 | 0.574 |
| Constant | -0.65 | 0.074 |
| | | |
| Observations | 364 | |
| Pseudo R ² | 0.14 | |

The asset size of \$500 million to \$1 billion was dropped due to a lack of observations for this size bin. The omitted size was under \$5 million so that all the size variables are measured relative to this smallest category. As expected the larger the firm, the less likely the firm will be out of compliance. Using one of the large audit firms is associated with a lower probability of being out of compliance, as indicated by the negative coefficient. The p-value of 0.1 indicates that this variable is only marginally statistically significant. This is partially due to multicollinearity with the size variables. For instance, when the dummy variable for the \$5 to \$25 million size range, which also has a relatively large p-value, is not included, the coefficient on Big Auditor falls to -0.83 with a p-value of 0.02.



Using the estimated logit equation, we calculate the average probability of firms being out of compliance if they do not use a big audit firm and the average probability if they use a big audit firm. The probability falls from 20% to 12%.

In order to infer β from this result we need to know how much additional expenditure using an external auditor requires. Craswell, Francis and Taylor [1995] estimate that Big 8 auditors in Australia earn a 30% premium over non-Big 8 auditors. Using this information we calculate

$$\beta = \log(0.12/0.2)/\log(1.3) = -1.95.$$

This calculation is derived directly from (1) using the change in the probability of misstatements with a change in expenditure on audit fees to isolate β . Since audit fees represent only a portion of total expenditures on internal controls, this estimate of β is arguably low (in absolute value), which will tend to result in an underestimate of total benefits.

The next variable we need to estimate is the probability of a misstatement, q . The COSO report [1999] found about 300 instances of alleged instances of fraudulent reporting in SEC Accounting and Auditing Enforcement Releases (AAERs) over an 11 year period, or 27.3 cases per year. Assuming one-tenth the number in Canada would imply 2.73 cases per year. However, these are only detected cases. An Ernst and Young study estimates a public detection rate of 20%.³⁵ This detection rate would imply 13.6 serious cases of misstatements reporting per year in Canada. There are 3,763 firms listed on the TSX and Venture Exchange. Thus the probability of a misstatement, q , for any given firm is about 0.36% (=13.6/3,763) per year. We assume the same probability of misstatements for all firms.

The final coefficients to estimate are α and γ , that relate the misstatement size to the size of the firm. The COSO [1999] report provides four data points:

?? Average misstatement of US\$25 million with average firm size of US\$533 million;

³⁵ Ernst and Young, "Fraud: The Unmanaged Risk", 2002. ([http://www.ey.com/global/download.nsf/Canada/Fraud_The_Unmanaged_Risk_Survey_2003/\\$file/Fraud_The%20Unmanaged%20Risk_Survey_2003.pdf](http://www.ey.com/global/download.nsf/Canada/Fraud_The_Unmanaged_Risk_Survey_2003/$file/Fraud_The%20Unmanaged%20Risk_Survey_2003.pdf))



- ?? Median misstatement of US\$4.1 million with a median firm size of US\$16 million;
- ?? First quartile misstatement and size (US\$1.6 million and US\$2.6 million); and,
- ?? Third quartile misstatement and size (US\$11.8 million and US\$73.8 million).

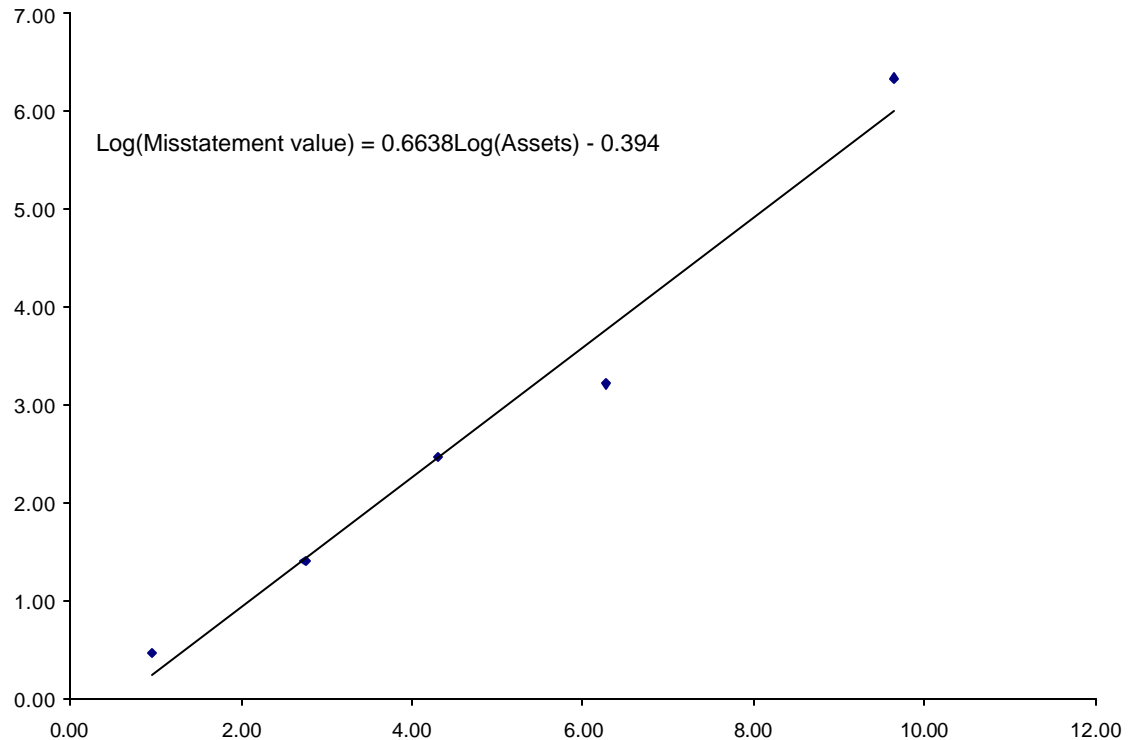
The Karpoff and Lott [1993] results indicate a 4.66% drop in equity value when fraudulent financial results are reported to be under investigation. This corresponds to firms reported in the *Wall Street Journal*, which are almost certainly reasonably large U.S. firms.³⁶ We assume the average Canadian cross-listed firms would have a similar 4.66% drop in equity value. However, due to leverage, a drop of 4.66% in equity value would require a smaller drop in asset value. For example, if equity holders have a claim on 80% of assets but suffer the entire loss of value from a misstatement (i.e., the value of assets owing to debt holders is secured as a first-order approximation), then an equity holder value would fall by 4.66% if the value of assets fell by $4.66\% \div 80\% = 3.7\%$. (The average debt to asset ratio for TSX interlisted firms is 20%.) On the other hand, this calculation does not include the value of good will. If good will was unaffected by the misstatement, then the drop in tangible asset necessary to induce a drop of 4.66% in equity value would be much larger.

Thus, using a 3.7% drop in asset value for an average size interlisted firm (\$15 billion), we obtain a third data point. A plot of total size of the misstatement (in logs) against firm size (in logs) is shown in Figure A1. The five points lie quite closely on the same regression line despite the fact that one come from a completely different source.

³⁶ Unfortunately, Karpoff and Lott do not provide any descriptive statistics of the firms they analyse.



Figure A1: Relationship Between the Size of Misstatement (and Misappropriation) and Firm Assets



The above estimates provide the information necessary to compute expected benefits. We first calculate the average increase as a percent of audit based on the cost increases reported in the cost section above. We then translate this into a reduction in the probability of misstatements and determine the expected benefits for each firm in the sample. Finally we sum over all firms and gross up to total industry size using the methodology described in the cost section.

A.1 Relationship Between Firm Size, Salaries and Audit Fees

We do not have detailed salary or audit fee data for each firm in our sample. Thus we must infer variables from the asset data. We hand collected data from random sample of firms' proxy circulars and estimated the relationship between audit fees and assets and a second relationship between CEO salary and assets.



The audit fees for some firms are combined with legal fees. We retained these observations in the regression but controlled for legal fees. We estimate a log-linear model. Table A2 shows the results. The adjusted R^2 is high at 0.67 indicating a good overall fit. The coefficient on Log Assets is 0.368 and is precisely measured. The interpretation is that for a 1% increase in assets, audit costs increase by only 0.37%. Thus the larger the firm, the lower audit costs are as a share of assets. This type of economy of scale effect explains much of the higher costs of certification for smaller firms.

Table A2: Regression of Log Audit Costs (and Legal Fees)

| | Coefficient | P-value |
|--------------------------|------------------|---------|
| Intercept | 5.52 (1.12) | 0.00 |
| Log Assets | 0.368 (0.055) | 0.00 |
| Legal Dummy | 6.85 (3.66) | 0.07 |
| Legal Dummy ? Log Assets | -0.38 (0.18) | 0.05 |
| | | |
| Adjusted R^2 | 0.67 | |
| Observations | 24 | |

We run a similar regression of CEO salaries on audit fees (in logs). We also included a dummy for the exchange the firm was listed on. Table A3 reports the results. The adjusted R^2 is reasonably high at 0.74. CEOs of Venture Exchange-listed firms earn a lower base salary (about 8% lower) than CEOs of similar size firms listed on the TSX. Salaries increase at a rate of 0.3% for each 1% increase in assets. Thus the base salary of the CEO generally makes up a smaller share of overall firm size the larger the firm. In the analysis we assume CFO base salaries are 70% of CEO base salaries.



Table A3: Regression of Log CEO Base Salary

| | Coefficient | P-value |
|---------------------------|-------------------|---------|
| Intercept | 7.25 (0.78) | 0.00 |
| Log Assets | 0.300 (0.039) | 0.00 |
| Venture Exchange Dummy | -0.080 (0.035) | 0.027 |
| | | |
| Adjusted R ² | 0.74 | |
| Observations | 51 | |



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