The Incremental Value Relevance of Geographic Segment Disclosures: Canadian Evidence

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Abstract

Recent changes to segment reporting standards in the U. S. and Canada have served to downplay the importance of geographic segment reporting in favour of segment reporting based on the internal decision-making structure of firms. Canada is a unique arena in which to study the potential value-relevance of geographic segment disclosure because it is an advanced, industrial nation characterized by significant political uncertainty related to the Quebec independence movement. Building on recent studies of the “Quebec discount” on firm values, we investigate the value-relevance of information related to the extent of firm operations within the province of Quebec. Using data provided by Quebec-based business newspaper Les Affaires, we find that variables proxying for extent of operations in Quebec are associated with market-to-book valuation multiples on book value and earnings, even after controlling for location of corporate headquarters.
The Incremental Value Relevance of Geographic Segment Disclosures: Canadian Evidence

1. Introduction

Segmented disclosures have been required under U.S. and Canadian generally accepted accounting principles for nearly three decades. The purpose of such disclosures is to enable more precise assessments of the value of diversified firms whose components may be characterized by different rates of growth, profitability and risk (Kochanek, 1974). Recent revisions to segmented reporting standards in the United States (1997) and in Canada (1999) changed the basis by which operating segments were determined and reduced the reporting requirements for geographic segments (Hermann and Thomas, 2000).

The purpose of this paper is to examine the value relevance of geographic segment disclosures in Canada. Like its U.S. counterpart SFAS 131, CICA Handbook section 1701 only mandates limited geographic segment disclosures. The Canadian standard requires that entities disclose revenues, capital assets, and goodwill attributable to (1) the country of domicile and (2) all foreign countries in total, unless it is impracticable to do so. There are no requirements for Canadian entities to provide any geographic segment information on a provincial or intranational regional basis.

However, some recent studies have found evidence of interprovincial differences in firm valuation within Canada. Tirtiroglu et al (2004) found that firms announcing relocation of corporate headquarters from Quebec to somewhere outside of Quebec experience positive

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1 The standards require that firms report disaggregated information according to the lines of business used for internal reporting purposes. If a firm’s lines of business used for internal reporting are based on geographic segments, then the disaggregated reporting under the revised standards could be more extensive than under the previous standards. However, many U.S. companies define their operating segments along other lines (Herrmann and Thomas, 1997) and the number of firms presenting earnings by geographic area has declined substantially since the adoption of the new standards (Herrmann and Thomas, 2000).
abnormal stock market returns. Similarly, Graham et al (2005) found that firms headquartered in Quebec have lower book value and earnings multiples than firms matched on industry and size headquartered elsewhere in Canada. These results suggest that some form of Quebec segment disclosure might enable more precise assessments of the value of firms operating in Quebec.

In this paper, we use data collected by Les Affaires, a Quebec-based business newspaper, to investigate the value relevance of segment information regarding Quebec versus non-Quebec operations. As in Graham et al (hereafter GMM), we document the existence of a “Quebec discount” in that firms headquartered in the province of Quebec trade at lower multiples of earnings and book value. We further find that adding information regarding the percentage of firm employees located inside Quebec provides value-relevant information over and above that provided by the location of corporate headquarters.

Our study makes two contributions. First, our study examines the value of intranational geographic segmented information, and thus yields insight into whether the requirement to release information only by country potentially neglects geographic data relevant to decision makers. Second, to our knowledge, our study is the first that examines the incremental information content of segment information reported by an external source rather than information reported within the financial statements. Therefore, our study is a joint test of the relevance of the segment information and the efficiency of the market with respect to information that is publicly available but is not distributed by the entity.

Our findings have implications for investors, reporting entities, and standard setters. For investors, information regarding the extent of operations inside and outside Quebec appears to be relevant to the firm’s market value. If this is the case, companies may wish to consider disclosing this information on a voluntary basis. Additionally, Canadian standard setters may

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2 Throughout this paper, Quebec refers to the province of Quebec and not simply its capital, Quebec City.
wish to consider whether such disclosure should be mandatory. As well, standard setters in
general may wish to revisit the decision to decrease the emphasis on geographic disclosures
and/or identify circumstances under which geographic segment disclosure, either international or
subnational, might be desirable.

The study is organized as follows. Section 2 reviews the existing literature on segmented
reporting and the conditions in Quebec that may have implications for firm value. Section 3
presents the regression model that we use in our empirical tests. Section 4 describes our sample
and results of univariate tests. The multiple regression results are presented in section 5.
Finally, section 6 provides some concluding remarks.

2. Segment Disclosures and the Canadian Context

2.1 Segment Disclosures

In 1976, the Financial Accounting Standards Board (FASB) issued SFAS 14, which
mandated disaggregated disclosures by both geographic segment and by industry, subject to
materiality guidelines. For each geographic segment, SFAS 14 required disclosure of revenues,
assets, and earnings. The Canadian standard, section 1701, contained similar provisions.
Following a joint project between FASB and the Accounting Standards Board of the Canadian
Institute of Chartered Accountants (CICA), revisions to these standards were adopted in both the
United States and Canada, in 1997 and 1999 respectively.

The revised standard requires that a series of key financial statement variables be
identified and reported on an operating segment basis. A reportable operating segment is a
component of an enterprise: (1) that engages in business activities from which it earns revenues
and incurs expenses; (2) whose operating results are regularly reviewed by the chief operating
decision maker; (3) for which discrete financial information is available; and (4) which meets or exceeds the materiality guidelines laid out in the standard. The disaggregated information provided in the financial statements is thus consistent with the information used internally by the enterprise’s management to make decisions about operating matters (CICA Handbook, Section 1701). An operating segment could be a geographic segment, or could be a segment identified with a particular line of business, depending on the internal decision-making structure of the firm.

Whatever operating segments are identified, some geographic reporting is still required. Specifically, revenues, capital assets and goodwill located (1) in the enterprise’s country of domicile and (2) located in all foreign countries in total, must be separately disclosed unless it is impracticable to do so.

The revised standards thus significantly reduced the reporting requirements for geographically segmented information. First, the revised standard no longer requires that profits be disclosed for each geographic segment. Second, the revised standard permits all operations outside the enterprise’s country of domicile to be aggregated. In contrast, the earlier standard required that information, including profit, be disclosed for each individual geographic area that met or exceeded the materiality guidelines provided in the standard. Management could nevertheless exercise considerable discretion over the identification of the existence of geographic areas, and how geographic areas could be aggregated (Gray and Radebaugh, 1984).

Previous literature has generally documented that information segregated by line-of-business is perceived as useful by decision makers and affects analyst forecasts (Baldwin, 1984; Berger, Hann and Piotroski, 2003; Lobo, Kwon and Ndubizu, 1998). The provision of disaggregated information also appears to improve the value relevance of accounting
information, although some studies have found the effect to be small. Tse (1989) employed a valuation model that expressed firm value as a function of earnings, growth, and book value, and found that the model’s performance was improved when segmented information was used to classify the growth of companies. Givoly et al (1999) found that the $R^2$ of regressions of market returns on earnings improved, but only slightly, when component segment earnings were used instead of firm level earnings.³ Chen and Zhang (2003) considered the incremental value relevance of segmented information in addition to firm-level information. They found that the value relevance of disaggregated information overall was quite small. However, the value relevance increased when operating segments had increasingly different profitability and growth opportunities.

The information content of geographic segment data has received relatively less attention, particularly since the revisions to the standards which have resulted in significant declines in reporting of earnings by geographic area (Hermann and Thomas, 2000). Boatsman et al (1993) examined stock market reactions to the release of unexpected profits by geographic segments disclosed in annual reports under SFAS 14. Although they observed an association, it was highly contextual, depending on the magnitude of unexpected foreign profits, the time periods and the region. They concluded that there was little evidence that geographic disclosures affected equity values. However, Thomas (2000) investigated the association between unexpected security returns and unexpected geographic segment earnings over long intervals, also during the pre-SFAS 131 period. Over long windows (exceeding 3 years), the market valued geographic segment earnings differentially, in a manner approximately consistent with

³ It has been suggested that such marginal results could be due to perceived unreliability of the segment information (Chen and Zhang, 2003). In fact Givoly, Hayn and D'Souza (1999) found that the measurement errors in segment information are larger than those in the financial information reported by single line-of-business firms.
the segment’s risk and growth characteristics. Therefore, these studies together provide weak evidence that geographic segment information is useful in valuing securities.

2.2 Geographic Segments in the Canadian Context

The Association for Investment Management and Research has stated that disaggregated information is vital to the prediction of future cash flows as different segments will generate dissimilar streams of cash flow to which are attached disparate risks (AIMR, 1993). Chen and Zhang (2003) similarly demonstrate theoretically and empirically that disaggregated line-of-business data is value relevant, and that its valuation impact increases with divergences of segment profitability and growth potential.

We hypothesize that segmented information regarding Quebec vs. non-Quebec operations would be value-relevant for Canadian firms as conditions in Quebec can affect profitability and risks of doing business. The Quebec business environment is characterized by (1) political uncertainty associated with the Quebec independence movement; and (2) legal and other political considerations that are unique to the province of Quebec. The next two sections describe these characteristics.

2.2.1 Political Uncertainty Associated with the Quebec Independence Movement

Most Canadians perceive that the current political uncertainty began with the FLQ (Front de Libération du Québec) crisis in 1970. The FLQ was an organization dedicated to Quebec sovereignty and engaged in terrorist activities that culminated in the kidnapping and assassination of Quebec labour minister Pierre Laporte in October 1970. FLQ terrorism came to an end, but the separatist movement did not. The Parti Québécois (PQ), a provincial political
party founded in 1967 by René Levesque, took control of the Quebec legislature in the provincial elections of 1976.4

PQ governments held provincial referendums on Quebec sovereignty in 1980 (rejected by 60% of voters) and 1995 (rejected by 50.6% of voters). Joint Canadian federal and provincial government efforts to solve the “Quebec problem” have given rise to two failed constitutional reform agreements: The Meech Lake Accord, which failed to receive ratification by all Canadian provinces in 1990; and the Charlottetown Accord, which was defeated in a national referendum held in 1992. Thus far, there is no apparent resolution to the uncertainties regarding Quebec’s political future.

Many writers are pessimistic about the economic prospects of a sovereign Quebec (for a review, see Hirsch, 1992). Fry (1995) suggests that a sovereign Quebec would likely face a number of short to medium term economic difficulties. The difficulties include: a crippling public debt combined with increased interest rates; an economic recession that would result in the loss of upwards of 100,000 jobs; the loss of what have been substantial transfers of funds from the rest of Canada; the uncertainty associated with negotiating economic and political relations with the rest of Canada; and the uncertainty related to international trade agreements like the North America Free Trade Agreement and the Canada-U. S. Auto Pact.

Some commentators have gone further, arguing specifically that Quebec sovereignty will have a direct, negative impact on Quebec firms. Dungan and Vaillancourt (1991) and

4 However, the Quebec sovereignty movement is not a recent phenomenon on the Canadian political landscape. Prior to the electoral successes of the Parti Québécois, nationalist parties dedicated to the ‘liberation’ of Quebec (or Lower Canada prior to confederation) have won majorities on three occasions: the Parti Patriote in the 1830s; the Parti National in 1886, and the Union Nationale in 1936. Bernard (1978) argues that the liberation movements are fuelled by three fundamental issues: (1) protection of the French language, (2) survival of the French ‘nation’ within Canada, and (3) economic factors, including discrimination against French-speaking (francophone) workers and federal government spending and hiring practices that have systematically favored English-speaking (anglophone) workers and predominantly anglophone provinces over francophones and Quebec.
Vaillancourt (1998), for example, contend that if Quebec eventually obtains sovereignty, Quebec firms will face greater competition from international markets, as NAFTA and GATT rules come to apply directly to Quebec. The argument that Quebec firms will face greater competition after sovereignty reflects, in part, that Quebec firms currently operate in a protectionist climate (Clarke, 1998).

The uncertainties of Quebec’s future could contribute to lower values for Quebec firms by (1) lowering market expectations of future cash flows and/or (2) increasing the uncertainty associated with those cash flows. What is particularly unusual about the Quebec independence issue is that it appears to affect primarily the value of firms located in Quebec, while firms outside of Quebec are relatively insulated from the effects of the sovereignty movement (Bell, 1998; Branswell, 1997).

Some studies have already found evidence that the factors listed above affect investors’ decisions. Johnson and McIlwraith (1998), for example, examined whether bond yields were affected by the likelihood that Quebec voters would pass the 1995 Sovereignty Referendum. Their results indicate that a 1% increase in the number of voters expressing the intention to vote for Quebec sovereignty was associated with a one-basis-point increase in Quebec provincial bond yields, relative to Canadian provincial and federal government bond yields. Higher bond yields suggest investors rationally adjusted their required rate of return upwards when the likelihood of secession increased.

2.2.2 Other Factors Specific to the Quebec Business Environment

The Quebec legal environment differs from that of other Canadian provinces in at least two important respects. First, the Quebec Civil Code, the most recent version of which took effect in 1991, has expanded the legal liabilities of firms (Erdle, 1994) and has made some
transactions, particularly the sale and purchase of existing businesses, more cumbersome (Gore and Rosentzveig, 1993). Secondly, the Charter of the French Language, more commonly known as Bill 101, mandates French as the language of business and limits access to English-language education for Quebec residents. Commentators have argued that Bill 101 compliance is very costly to Quebec businesses (Bickerstaffe, 1981), while others suggest that Bill 101 has caused an exodus of many English-speaking managers and companies from Quebec to Anglophone provinces (Fagan, 1996; Swift, 1999). Language charter compliance costs and the possible shortage of managers in Quebec could result in substantial additional costs for Quebec firms and, therefore, lower profitability relative to Canadian firms located outside of Quebec.

In addition, Quebec governments have occasionally intervened to keep Quebec companies from being taken over by U. S. or English Canadian interests. In 1998, for example, Quebec Premier Bouchard openly stated his opposition to the proposed acquisition of Montreal-based grocery chain Provigo by Ottawa-based Loblaw. Corporate takeovers have generally been found to be beneficial to the shareholders of target firms (Jensen and Ruback, 1983; Draper and Paudyal, 1999); and government-imposed restrictions on the market for corporate control have generally been found to reduce the value of some firms (Szewczyk and Tsetsekos, 1992). To the extent that the Loblaw-Provigo episode reflects a continuing policy of Quebec governments, the potential for takeover gains could be lower for Quebec firms relative to other Canadian firms and would lower the value the shares of Quebec firms accordingly\(^5\), although profitability would presumably be unaffected.

\(^5\) An analogous situation occurs to minority shareholders in majority-owned (controlled) firms. Graham and Lefanowicz (1999) find that minority interest share values are discounted relative to majority interests share values. Graham and Lefanowicz argue that the discounting is rational price protection by the minority shareholders.
In summary, the features of the Quebec environment could result in differential profitability, growth opportunities, and risks, which would indicate that information disaggregated by Quebec vs. non-Quebec segments could have value relevance. While GMM established that firms *headquartered* in Quebec traded at a discount, we investigate here whether the incorporation of segment information regarding the extent of operations in Quebec is incrementally value relevant. For example, a firm headquartered in Quebec but with significant operations outside of Quebec may be less affected by the “Quebec discount.” Conversely, a firm headquartered outside of Quebec, but with significant operations inside Quebec, could be adversely affected.

3. Regression Analysis

3.1 Research Model

GMM find evidence of systematic differences in the valuation of firms headquartered in Quebec, relative to non-Quebec firms. In this section, we replicate and extend the multiple regression tests used by GMM to assess the impact on firm value of the extent of corporate operations in the province of Quebec.

Following the model formalized by Ohlson (1995) and used by Collins *et al* (1997) and Ely and Pownall (2002), the value of a firm’s equity can be expressed as a function of its earnings and book value:

\[ \text{MVE}_{it} = \beta_0 + \beta_1 \text{BVE}_{it} + \beta_2 \text{E}_{it, t-1} + \nu_{it} \quad (1) \]
where \( MVE_{it} \) equals the market value of firm \( i \) at the end of year \( t \), \( BVE_{it} \) equals the book value of firm \( i \) at the end of year \( t \), \( E_{it-1}^t \) equals the earnings of firm \( i \) during year \( t \), and \( v_{it} \) is the other value-relevant information for firm \( i \) for year \( t \) orthogonal to book value and earnings.\(^6\)

### 3.2 The Price-Levels Regression Model Expanded to Test for Differential Relations

Researchers have demonstrated analytically that the coefficients on book value and earnings vary with persistence of abnormal earnings, discount rates, accounting conservatism, and growth (Feltham and Ohlson, 1995; Easton, 1999). Collins *et al* found that the value-relevance of earnings for U. S. firms has declined on average over time, while the value-relevance of book value has increased. In addition, they find that the coefficients on book value and earnings differ significantly over time and across industries and firms of different sizes.

This research suggests that the book value and earnings coefficients in equation (1) can vary across industries and regimes. GMM tested for differential market-to-book relationships by expanding equation (1) as below:

\[
MVE_{it} = \eta_t + \eta_t^*Q + \beta_1 BVE_{it} + \beta_2 Q^*BVE_{it} + \beta_3 E_{it-1}^t + \beta_4 Q^*E_{it-1}^t + e_{it}
\]

where \( Q \) represents an indicator variable taking the value of one for Quebec firms and zero otherwise; and \( (\eta_t) \) are year-specific intercepts. The coefficient \( \beta_1 \) represents the valuation multiple for non-Quebec firms’ book values. \( \beta_1 + \beta_2 \) represents the valuation multiple for Quebec firms’ book values. Similarly, the coefficient \( \beta_3 \) represents the valuation multiple for non-Quebec firms’ earnings. \( \beta_3 + \beta_4 \) represents the valuation multiple for Quebec firms’ earnings. GMM found that \( \beta_2 \) and \( \beta_4 \) were both negative, and concluded that the valuation multiples of

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\(^6\) The principal advantage in using the model described in equation (1) is that there is no need to distinguish between normal and abnormal earnings.
Quebec firms were systematically lower than those of industry-matched, non-Quebec Canadian firms.

In this paper, we expand equation (2) as follows:

\[
MVE_{it} = \eta_t + \eta_t^*Q + \beta_1BVE_{it} + \beta_2Q*BVE_{it} + \beta_3E_{it-1 to t} + \beta_4Q*E_{it-1 to t} + \beta_5PCT_{it} + \beta_7Q*PCT_{it} + \beta_8PCT*BVE_{it} + \beta_9PCT*E_{it-1 to t} + e_{it}
\]

(3)

where MVE, Q, BVE and E are as defined above; \(\eta_t\) are year- and industry-specific intercepts; and PCT is a measure of the extent of firm operations in Quebec. If extent of operations in Quebec is an incremental (or a better) measure of the exposure of firms to political uncertainty relative to location of firm headquarters, we would expect \(\beta_7\) and/or \(\beta_8\) to be negative.

3.3 Controlling for Systematic Differences between Quebec and Non-Quebec Firms

Our primary interest is in the interaction of locality (Q) and extent of operations (PCT) with the valuation multiples for BVE and E. However, firms can differ on a number of characteristics that can affect the relation between book value, earnings and market value. As in GMM, we include variables to control for systematic differences in growth rate and leverage. Growth rate (Growth) equals the percentage change in sales over the prior three years. Leverage (LEV) is calculated by dividing total liabilities by total assets.

4. Data

Les Affaires is a French-language, Quebec-based business newspaper that publishes an annual listing of the top 500 firms in Canada and in Quebec, and the top 500 small and medium firms in Quebec. Les Affaires uses survey questionnaires to collect directly from these firms data on the number of employees and book value of assets stationed both inside and outside Quebec,

\footnote{The restrictions of our sample make it impossible to match firms on industry. Therefore, we use industry-specific intercepts to control for potential industry effects on stock market values.}
as well as revenue earned inside and outside of Quebec. This data is available on the *Les Affaires* website (www.lesaffaires.com, at the time of this writing).

We matched firms from the *Les Affaires* lists with those in the Compustat Canadian database. This gave us an initial sample of 1,489 firm-years. Firm-years that were missing key Compustat data, and/or firms with negative shareholders’ equity, were deleted from the sample. In addition, we eliminated firm-years with extreme values (top and bottom 2% of sample) of earnings and sales growth, and extremely high (top 2%) leverage. These deletions left a final sample of 1,008 firm-years from 133 firms, spread over the fiscal years 1990 – 2003. Table 1 presents the industry distribution of firms and firm-years in our sample.

**INSERT TABLE 1 HERE**

Of the 133 firms in the sample, 82 were headquartered in the province of Quebec and 51 were headquartered outside of Quebec. Descriptive statistics of key financial data for the Quebec and non-Quebec firms are presented in Table 2. On average, the non-Quebec firms in the sample are larger than the Quebec firms in terms of net sales, earnings before extraordinary items, assets, book and market value of common equity. These differences are less pronounced when earnings and shareholders’ equity are deflated by common shares outstanding.

**INSERT TABLE 2 HERE**

Not surprisingly, Quebec firms have a much higher proportion of total firm employees, sales and assets in Quebec than do the non-Quebec firms. It is also noteworthy that most firms in our sample did not provide information on either Quebec sales or assets. For firm-years for which such information is available, the correlations between percentage of employees in Quebec and percentage of sales in Quebec (Pearson r = 0.76, n = 367, p < 0.001), and between
percentage of employees in Quebec and percentage of assets in Quebec (Pearson r = 0.82, n = 385, p < 0.001) are both significantly positive.

5. Regression Results

Regression results for equation (3) are presented in Table 3. Model 1 is a direct replication of GMM that tests for a value-relevant interaction between location of headquarters and earnings and book value of common equity. As in their study, book value of equity and earnings are both significantly positive and both interaction terms are negative, implying the existence of a “Quebec discount.” Only the interaction between book value of equity and location of headquarters is statistically significant, however, where GMM found both interaction terms to be significant. This difference could be due to the slightly different, and much smaller, sample in our study.

INSERT TABLE 3 HERE

In model 2, we estimate the effect of extent of firm operations in Quebec, rather than location of firm headquarters. We use percentage of total firm employees based in Quebec as a proxy for extent of firm operations in Quebec. Either assets or revenues would be more obvious proxies for extent of operations but, as indicated above, data on Quebec assets and revenues are only available for a relatively small proportion of the firms in our sample. The high positive correlations between percentage of employees in Quebec and percentage of assets and percentage of revenues (see previous section) give some assurance that percentage of employees is an effective proxy for extent of firm operations in Quebec.
The model 2 results indicate a significant, negative interaction between percentage of employees in Quebec and book value of common equity. Contrary to our expectations, the interaction between percentage of employees in Quebec and earnings is positive.

Model 3 includes both headquarters location and percentage of employees in Quebec, thereby allowing us to assess the incremental value relevance of percentage of employees in Quebec after controlling for headquarters location. Here, the interaction between headquarters and book value of equity is not statistically significant, while the interaction between percentage of Quebec employees and book value of equity is negative and significant. This implies that percentage of employees in Quebec might be more closely associated with the “Quebec discount” than is the location of corporate headquarters.

In model 3, the interaction between location and earnings is negative and significant. The interaction between percentage of employees in Quebec and earnings, however, is positive and highly significant by conventional standards. This result seems to suggest that the market places greater value on the earnings of firms whose activity is more concentrated within Quebec. This, in turn, is consistent with the notion that the separation of Quebec from Canada is viewed as more consequential for firms that conduct relatively more business outside of Quebec. In the event of separation, such firms might be exposed to greater risks associated with exporting goods and services between sovereign nations.

6. Conclusion

Recent changes to segment reporting standards in the U. S. and Canada have served to downplay the importance of geographic segment reporting in favour of segment reporting based on the internal decision-making structure of firms. Canada is a unique arena in which to study
the potential value-relevance of geographic segment disclosure because it is an advanced, industrial nation characterized by significant political uncertainty related to the Quebec independence movement. Recent studies have already documented evidence that locating firm headquarters in Quebec (Graham et al, 2005), and moving corporate headquarters from Quebec to outside the province (Tirtiroglu et al, 2004), have valuation implications for Quebec firms. In this study, we investigate the value-relevance of information related to the extent of firm operations within the province of Quebec.

Although firms operating in Quebec do not routinely disclose information on the extent of their Quebec operations, such information is collected and published by the Quebec-based business newspaper Les Affaires. We use percentage of total firm employees based in Quebec to proxy for extent of firm operations in the province of Quebec. Regression results indicate that percentage of employees in Quebec has statistically significant effects on book value and earnings multiples of firms operating in Quebec, even after controlling for location of corporate headquarters.

Our results have implications for standard-setters who might want to consider extending segment disclosure requirements to geographic segments characterized by political uncertainty. However, adding the percentage of employee interaction terms to the valuation regression models only increased the regression R² by one percentage point. It is impossible to determine whether the benefit of such a small increase in explanatory power is worth the cost of preparing additional segment information. This is a particularly important issue here because the high cost of preparing segment information was one of the factors that led to the change in segment reporting standards in the 1990’s.
On the other hand, the percentage of employees in Quebec is only a crude proxy for extent of firm operations in Quebec, and the information provided by firms to Les Affaires was not, in our understanding, subject to third-party verification. It seems likely that more extensive, audited Quebec segment information might be considerably more value-relevant.
7. References


Table 1. Sample Firms Sorted by Industry Category

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<th>Standard Industrial Classification Code</th>
<th>Industry Description</th>
<th>Firms</th>
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Table 2. Descriptive Statistics

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<th>Non-Quebec firms (n = 51)</th>
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**Per common share**

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<th></th>
<th>Quebec firms (n = 82)</th>
<th>Non-Quebec firms (n = 51)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
</tr>
<tr>
<td>Earnings</td>
<td>590</td>
<td>0.80</td>
</tr>
<tr>
<td>Book value of equity&lt;sup&gt;b&lt;/sup&gt;</td>
<td>590</td>
<td>9.17</td>
</tr>
<tr>
<td>Market value of equity&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>588</td>
<td>11.64</td>
</tr>
</tbody>
</table>

**NOTES**
Quebec firms (n is the number of firms in the sample) are firms whose corporate headquarters are located in the province of Quebec. Non-Quebec firms are headquartered outside of Quebec. N is the number of firm-years in the sample. Earnings is income before extraordinary items. 3-year sales growth is the percentage increase in net sales over the previous three years. Book value of equity is the book value of common shareholders’ equity; market value of equity is the market value of common shares; and leverage is total liabilities divided by total assets. Net sales, earnings, assets, common equity and market value are all in millions of Canadian dollars (except per share figures). **Per common share** items are deflated by common shares outstanding at fiscal year end. All balance sheet and market figures are as at fiscal year end. All income statement figures are for the fiscal year. % employees, sales and assets in Quebec are percentage of total firm employees, sales and assets located or earned in Quebec, and are as reported in *Les Affaires*. All other figures are from Compustat.

a: indicates that the difference in mean value for Quebec vs. non-Quebec firms is statistically significant (p < 0.05, two-tailed test).
b: indicates that the difference in medians between the Quebec and non-Quebec samples is statistically significant using a Mann-Whitney U test (p < 0.05, two-tailed test).
Table 3. Regression Results

\[ M_{\text{veit+2}} = \eta_t + \eta_t^*Q + \beta_1\text{Pct}_{it} + \beta_2Q^*\text{Pct}_{it} + \beta_3\text{Bve}_{it} + \beta_4\text{Earns}_{i,t-1 to t} + \beta_5\text{Growth}_{i,t-3 to t} + \beta_6\text{Lev}_{it} + \beta_7Q^*\text{Bve}_{it} + \beta_8Q^*\text{Earns}_{i,t-1 to t} + \beta_9Q^*\text{Growth}_{i,t-3 to t} + \beta_{10}Q^*\text{Lev}_{it} + \beta_{11}\text{Pct}^*\text{Bve}_{it} + \beta_{12}\text{Pct}^*\text{Earns}_{i,t-1 to t} + \beta_{13}\text{Pct}^*\text{Growth}_{i,t-3 to t} + \beta_{14}\text{Pct}^*\text{Lev}_{it} + e \]

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Expected sign</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \text{Pct}_{it} )</td>
<td>+</td>
<td>109.84</td>
<td>194.68</td>
<td>490.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.157)</td>
<td>(.155)</td>
<td>(.000)</td>
</tr>
<tr>
<td>( Q^*\text{Pct}_{it} )</td>
<td>-</td>
<td>-0.20</td>
<td>0.07</td>
<td>-516.94</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.012)</td>
<td>(.516)</td>
<td>(.000)</td>
</tr>
<tr>
<td>( \text{Bve}_{it} )</td>
<td>+</td>
<td>1.44</td>
<td>1.30</td>
<td>0.24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.000)</td>
<td>(.000)</td>
<td>(.884)</td>
</tr>
<tr>
<td>( \text{Earns}_{i,t-1 to t} )</td>
<td>+</td>
<td>2.02</td>
<td>1.75</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>(.000)</td>
<td>(.000)</td>
<td>(.991)</td>
</tr>
<tr>
<td>( \text{Growth}_{i,t-3 to t} )</td>
<td>+</td>
<td>0.24</td>
<td>0.00</td>
<td>-0.03</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.884)</td>
<td>(.991)</td>
<td>(.931)</td>
</tr>
<tr>
<td>( \text{Lev}_{it} )</td>
<td>+</td>
<td>490.1</td>
<td>198.13</td>
<td>474.85</td>
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<tr>
<td></td>
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<td>(.000)</td>
<td>(.090)</td>
<td>(.002)</td>
</tr>
<tr>
<td>( Q^*\text{Bve}_{it} )</td>
<td>-</td>
<td>-0.20</td>
<td>0.07</td>
<td>0.24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.012)</td>
<td>(.516)</td>
<td>(.000)</td>
</tr>
<tr>
<td>( Q^*\text{Earns}_{i,t-1 to t} )</td>
<td>+</td>
<td>-0.06</td>
<td>-1.05</td>
<td>0.24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.323)</td>
<td>(.000)</td>
<td>(.610)</td>
</tr>
<tr>
<td>( Q^*\text{Growth}_{i,t-3 to t} )</td>
<td>+</td>
<td>0.10</td>
<td>0.15</td>
<td>0.24</td>
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<tr>
<td></td>
<td></td>
<td>(.734)</td>
<td>(.610)</td>
<td>(.035)</td>
</tr>
<tr>
<td>( Q^*\text{Lev}_{it} )</td>
<td>+</td>
<td>-516.94</td>
<td>-315.35</td>
<td>0.24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.000)</td>
<td>(.035)</td>
<td>(.055)</td>
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<tr>
<td>( \text{Pct}^*\text{Bve}_{it} )</td>
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<td>-0.36</td>
<td>-0.99</td>
<td>-5.0</td>
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<tr>
<td></td>
<td></td>
<td>(.022)</td>
<td>(.000)</td>
<td>(.860)</td>
</tr>
<tr>
<td>( \text{Pct}^*\text{Earns}_{i,t-1 to t} )</td>
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<td>0.95</td>
<td>3.16</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.025)</td>
<td>(.000)</td>
<td>(.860)</td>
</tr>
<tr>
<td>( \text{Pct}^*\text{Growth}_{i,t-3 to t} )</td>
<td>+</td>
<td>0.25</td>
<td>0.07</td>
<td>-5.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.03)</td>
<td>(.000)</td>
<td>(.055)</td>
</tr>
<tr>
<td>( \text{Pct}^*\text{Lev}_{it} )</td>
<td>+</td>
<td>-299.54</td>
<td>-301.81</td>
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<tr>
<td></td>
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<td>(.026)</td>
<td>(.055)</td>
<td>(.055)</td>
</tr>
</tbody>
</table>

Adjusted R$^2$  

<table>
<thead>
<tr>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.85</td>
<td>0.85</td>
<td>0.86</td>
</tr>
</tbody>
</table>

**NOTES**

\( M_{\text{veit+2}} \) equals the common equity market value for firm i at balance sheet date t plus two months. \( Q \) represents an indicator variable equaling one for firms headquartered in Quebec and zero otherwise. \( \text{Pct} \) is the percentage of firm employees based in Quebec. \( \text{Bve} \) equals the common equity book value per share for firm i at balance sheet date t. \( \text{Earns}_{i,t-1 to t} \) equals income before extraordinary items. \( \text{Growth} \) equals the percentage change in sales for firm i over the prior three years. \( \text{LEV}_{it} \) equals firm i’s total liabilities divided by total assets. \( \eta_t \) represents indicator variables for the years and industries in the sample (results not shown). All variables, including the intercepts are scaled by total common shares outstanding. P-values for coefficients with expected signs are one-tailed; all other p-values are two-tailed.