

Proportionate Consolidation vs. the Equity Method: A Decision Usefulness Perspective on Reporting Interests in Joint Ventures

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ABSTRACT

The number of joint ventures, and the number of industries in which joint ventures are commonplace, have expanded considerably over the past twenty years. The prescribed treatment for accounting for interests in joint ventures varies across nations, with some requiring the equity method (e. g., the United States) and some requiring proportionate consolidation (e. g., Canada). A 1999 report by the G4+1 recommends that venturers use the equity method to account for interests in joint ventures, but cautions that there is very little empirical evidence on the decision usefulness of one approach over the other. This paper provides empirical evidence on this question by analyzing the financial statements of Canadian firms reporting joint ventures over the period 1995-2000. Our results show that ratios calculated from proportionately consolidated venturer financial statements are more useful in predicting one-, two- and three-year-ahead return on common shareholders' equity than are ratios calculated from venturer financial statements prepared under the equity method. We conclude that, at least for this set of firms, proportionate consolidation provides information with greater predictive ability and, therefore, greater relevance to financial statement users than does the equity method.

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1. Introduction

This study examines financial reports of Canadian firms with interests in joint ventures (venturers) to provide evidence concerning the use of proportionate consolidation and its effects relative to the use of the equity method. Canadian Generally Accepted Accounting Principles require that firms use the proportionate consolidation method to account for investments in joint ventures. Other countries, including the United States, require that firms use the equity method. Although the two methods result in identical net income and shareholders' equity, they yield significant differences in other components of the financial statements. In this study, we document the financial statement differences resulting from the two methods and compare them on their ability to predict future profitability. We address the question of whether proportionate consolidation or the equity method provides the more informative financial statements for firms holding interests in joint ventures.¹

This examination is timely in that the appropriate accounting procedure for joint ventures currently is being debated in the United States and internationally. In September 1999 the US Financial Accounting Standards Board (FASB) issued a special report developed by the G4+1 on the differences across countries in accounting treatments for joint ventures (Milburn and Chant

¹ "To be relevant, information must have the capacity to help users make decisions" (FASB 1980). We presume that a greater ability to predict future profitability allows market participants to make better investment decisions.

1999).² The report concludes that, conceptually, joint ventures are best defined by the presence of joint control. Further, the authors recommend that joint ventures should be accounted for by the equity method, and the joint venture's balance sheet, income statement and cash flow items should be disclosed. Our study extends the G4+1 report by providing the empirical evidence lacking in the report and in prior research into the accounting for joint ventures.

The G4+1 report identified joint ventures as a topic of study because of the increase in international joint ventures during the business globalization of the 1980's and 1990's and because of the different joint venture accounting practices across the G4+1 countries. Although historically joint ventures have been common in the real estate and extractive industries, increasingly joint ventures are being used by all types of companies to access potentially lucrative but unfamiliar international markets (Goldberg and Wolf 1993). However, countries differ both in their definition of what constitutes a joint venture and in their prescribed accounting treatment. For example, the United States broadly defines joint ventures as "operated by a small group of businesses (the joint venturers) as a separate and specific business or project for the mutual benefit of the members of the group" (APB opinion No 18). In Canada the definition is more specific: "A joint venture is an arrangement whereby two or more parties (the venturers) *jointly control* [emphasis added] a specific business undertaking and contribute

² The G4+1 was an informal group of representatives of accounting standard setters in Australia, Canada, New Zealand, the United Kingdom and the United States with representatives from the International Accounting Standards Committee (IASC) participating as observers. Its primary role was advisory and has prepared special reports on business combinations (1997), Financial Performance (1998), Joint Ventures (1999) and nonreciprocal transfers (1999). The goal is to identify future accounting issues and inform standards setters of alternative practices. It was formed in part to bring together representatives from countries that subscribe to the accounting philosophy that the purpose of financial accounting is to provide information to users of financial statements (Beresford 2000). The G4+1 disbanded in 2001.

"In the past it has been the intention of these Special Reports to serve as the basis for subsequent standard setting consideration by the national standard setters. As a consequence, it can be expected that this Special Report will serve as part of the FASB's foundation as it begins to seriously address the issue of accounting for unconsolidated investees" Munter (2000).

resources toward its accomplishment” (Canadian Institute of Chartered Accountants [CICA] Handbook, Section 3055).³

The United States, Australia, New Zealand and the UK require that the equity method be used in accounting for joint ventures. The equity method shows an investment in a joint venture as single line items on the venturer’s balance sheet and income statement. Canada requires, and International Accounting Standards and continental countries in the European Union prefer, proportionate consolidation accounting for joint ventures. Proportionate consolidation includes the venturer’s share of a joint venture’s assets, liabilities, revenues and expenses on the venturer’s balance sheet and income statement. Although the two methods result in the same total income reported by the venturer, the components of the income statements differ. Balance sheet components and totals will also differ. Under the equity method only the net investment is included as an asset. Therefore, total assets and liabilities are larger under proportionate consolidation. Consequently, proportionate consolidation may provide more specific information about a joint venture than does the equity method.

The relevance of this specific information depends, in part, on whether the joint venture component information helps to predict the venturer’s future profitability. We address the question of predictive ability with a sample of 78 Canadian firms reporting proportionately consolidated joint ventures over the years 1995 through 2000. Because the joint venture disclosures required by Canadian GAAP provide the necessary data to create pro-forma equity method financial statements, we are able to compare financial ratios under proportionate consolidation with financial ratios under the equity method. Since we compare ratios for the same firms, our study design avoids the noise introduced by comparing samples of different

³ *Joint control* is a distinctive feature of joint ventures as defined by the CICA Handbook. Joint control is “the contractually agreed sharing of the continuing power to determine . . . [the] . . . strategic operating, investing and financing policies” of an economic activity (Section 3055). Hilton (2000) explains that joint control “. . . is established by an agreement between venturers (usually in writing), whereby no one venturer can unilaterally control the joint venture regardless of the amount of assets it contributes” (p. 397).

firms. In addition, the specific definition of joint ventures under Canadian GAAP provides a more homogeneous sample than would firms from countries that define joint ventures more broadly.

This study provides the first empirical comparison of the proportionate consolidation and equity methods of accounting for joint ventures. We find evidence that venturer financial statements prepared using proportionate consolidation for joint venture interests provide better predictions of future profitability than do financial statements prepared using the equity method. Greater predictive ability suggests that proportionate consolidation may have more relevance than the equity method for market participants interesting in predicting venturers' future performance, at least as they are defined by Canadian GAAP.

The remainder of the study proceeds as follows. Section 2 provides a discussion of the debate over the appropriate accounting procedure for joint ventures. Section 3 describes the sample and differences in the venturers' financial statements prepared under proportionate consolidation and the equity method. Section 4 introduces the study design. In section 5 we present the methods and results of tests of predictive ability. Section 6 summarizes our findings.

2. The Debate over Proportionate Consolidation and the Equity Method

Proportionate consolidation differs from the equity method in the components of the joint venture that appear in the venturer's financial statements. The primary arguments for proportionate consolidation reflect the assumption that the components provide more useful information than does the equity method's single line presentation. For example, future profitability measures, such as the return on common shareholders' equity, might be better predicted using ratios that incorporate joint venture assets, liabilities and sales. Despite recommending the equity method, Milburn and Chant (1999, 3.18) admit that "[p]ortraying the venturer's share of the activities of the joint venture as part of the venturer's operations provides

a broader and more comprehensive representation of the extent of venturer operation and assets and liabilities.” Apparently, some financial analysts look for specific information about joint venture assets to evaluate venturers, at least in those industries where joint ventures are a common practice (Freedman 1996).⁴

The primary arguments for the equity method focus on the lack of a theoretical basis for recording the proportionate share of joint venture accounts because resources and claims subject to joint control do not fit with the traditional definitions of assets and liabilities. Proponents of the equity method do not see joint control as equivalent to actual control. Rather, joint control is more like significant influence, the primary criterion in applying the equity method. “[A] venturer cannot control (that is, use or direct the use of) its pro rata share of individual assets in a joint venture,” yet proportionate consolidation displays the joint venture as if the venturer can (Milburn and Chant 1999: 3.12). To others, the power of joint control is substantively greater than that significant influence and should be distinguished from investments accounted for by the equity method (Bierman 1992).

Proponents of the equity method also argue that if the venturer does not guarantee the liabilities of the joint venture and does not otherwise have an obligation for them, the debt should not be shown on the venturer’s balance sheet. “[I]t is wrong in principle for a venturer enterprise to reflect a pro rata share of a joint venture’s debt that is not a present obligation of the venturer enterprise” (Milburn and Chant 1999: 3.12). Because the venturer is not ultimately responsible

⁴ Proportionate consolidation also reduces the opportunity to use joint ventures as a means of off-balance sheet financing thus reducing the burden of uncovering hidden liabilities (Freedman 1996; Bailey 2001).

for the debt, the argument is that the venturer should not have to disclose the debt as if it was their obligation.⁵

However, Bierman (1992) argues that joint venture debt is relevant despite the fact that the venturer may be protected from the debts of the joint venture. Using a Modigliani and Miller (1958) analysis, Bierman argues that ventures financed by different levels of debt create different returns for the venturers because of the savings from the tax deductibility of interest.⁶ It follows that the equity method could inappropriately present levered and unlevered ventures as equivalent investments. As a consequence, some believe the use of proportionate consolidation enhances comparability of firms holding investments in joint ventures with different levels of debt. Even so, some proponents of the equity method believe that proportionate consolidation produces financial statements that may be hard for a potential investor to interpret and that comparability will be adversely affected. Bierman (1992) notes that “. . . the primary disadvantage of proportionate consolidation is that accounting complexities are introduced compared to just showing an investment in common stock” (p. 15).

The Canadian Experience

The history of joint venture accounting in Canada illustrates many of the issues raised in the prior section. Prior to 1974, Canadian GAAP required the equity method to report interests in

⁵ However, some venturers are contingently liable for their joint venture's debt (see Appendix A). One reporting option is to require venturers to proportionately consolidate only joint venture recourse debt. Lott (1997) argues for proportionate consolidation based on two “essential characteristics”: the venture's ability to control the assets of the venture and the exposure of the investors' assets to the liabilities of the venturer. An analysis of joint ventures in the Australian real estate industry suggests that in practice Australian venturers chose proportionate consolidation over the equity method when the joint venture debt was recourse and the equity method when the joint venture debt was non-recourse (Whittred and Zimmer 1994). Furthermore, there is some evidence that venturer bond raters will include joint venture liabilities with the venturer's liabilities to the extent the joint venture liabilities are contingently guaranteed by the venturer (Bailey 2001). Interestingly the bond raters do not include the corresponding joint venture assets.

⁶ To illustrate, consider a 50 percent investment to establish an unlevered (UL) venture with \$100 in assets and a 50 percent investment to establish a levered (L) venture with \$400 in assets and \$300 in debt. Assume both ventures have return on assets of 10 percent and after-tax risk-free interest rates of 6 percent. The \$10 earned by the assets of the UL venture is wholly attributable to the owners. Thus the UL shareholders receive \$10 on an investment of \$100 ($\$10/\$100 = .10$). The \$40 earned by the assets of the L venture is split between the debt holders ($\$300 \times .06 = \18) and the shareholders ($\$40 - \$18 = \$22$) Thus the L shareholders earn a 22 percent return ($\$22/\$100 = .22$).

joint ventures. Ludwick and Simpson (1973) described the case of the Canadian real estate firm Fairview Corporation⁷, which held significant investments managed as joint ventures.

Fairview's management argued that use of the equity method to account for these investments could result in significant understatement of the company's cash and other assets. To overcome the perceived deficiencies of the equity method, Fairview's management opted in 1972 for side-by-side dual presentation of the firm's financial statements. The statements were shown on a "consolidated" basis (using the equity method for joint venture interests) and on a "combined" basis (using proportionate consolidation for joint venture interests). Interestingly, the external auditors' report included separate, clean opinions on both sets of financial statements.

The CICA began studying the question of investments in joint ventures in 1974 and amended the CICA Handbook in September 1974 to allow the use of proportionate consolidation for corporate joint ventures. In 1977, a new section, section 3055, was added to the Handbook which allowed firms to use either the equity method or proportionate consolidation to account for interests in corporate or unincorporated joint ventures (Mulcahy 1977).

A number of factors prompted the CICA to reconsider the joint ventures issue in the early 1990's (Willett 1995). First, the number of joint ventures, both domestic and international, had increased significantly since the 1970's. Second, the CICA Accounting Standards Board had noted that some companies were using both proportionate consolidation and the equity method to report different interests in similar joint ventures and that improvements were therefore needed to eliminate unjustified alternative accounting methods. Third, the Ontario Securities Commission had identified that companies were having trouble applying section 3055, particularly with regard to the recognition of gains and losses on the transfer of assets to a joint venture, and asked the CICA to provide some additional guidance. Finally, the International

⁷ Fairview Corporation is now Cadillac Fairview Corporation and is included in our analysis later in the study.

Accounting Standards Committee published IAS 31, “Financial reporting of interests in joint ventures,” in January 1991, which recommended the use of proportionate consolidation to account for investments in jointly controlled entities.

In 1994, the CICA approved a revised version of section 3055 that required the use of proportionate consolidation. The revised section 3055, currently in effect, also requires that the venturer disclose the following information related to its interest in joint ventures: current assets and long-term assets; current liabilities and long-term liabilities; revenues, expenses and net income; cash flows resulting from operating, financing and investing activities; and the venturer’s share of any contingencies and commitments when the venturer is contingently liable for the liabilities of the other venturers of the joint venturer (CICA 2000). An example of such disclosures is presented in Appendix A.

3. A Sample of Venturers Using Proportionate Consolidation

We obtained an initial sample of venturers from the 1999 Standard and Poor’s Disclosure file of Canadian Company financial statements. The 1999 Standard and Poor’s Disclosure file contains 158 venturers with financial statements that include the key words “proportionate consolidation”. Of these, 78 provided disclosures relevant to a joint venture during the period of 1995-2000.⁸ We collected the venturers’ financial statement information and footnote disclosures on their joint ventures for the 1995-2000 period from the Disclosure files or from the System for Electronic Document Analysis and Retrieval (SEDAR), that contains filings with the Canadian Securities Administrators.⁹

⁸ Of the 158 financial statements in the initial sample, 62 reported no specific data on their joint ventures either because the joint ventures had been disposed of in earlier years or the joint ventures were immaterial, 15 had stopped reporting prior to 1995, and three were duplicate financial statements. For comparison, a key word search of United States firms using *10K Wizard* yields 25 firms using proportionate consolidation; all in either the mining industry or the oil extraction industry.

⁹ SEDAR is the Canadian equivalent of EDGAR, the system in use in the United States for filings with the Securities and Exchange Commission.

Distribution of joint ventures across industries

Table 1 shows the 78 venturers categorized by two-digit SIC code industry. The venturers appear reasonably distributed across the eight industries identified by the U.S. Department of Commerce. The third column of Table 1 shows the number of the joint ventures within each industry that could be specifically identified in the venturers' notes. The number of joint ventures held by venturers appears to vary widely – from one to over twenty – and to be related to industry. For example, firms in the oil and gas industry (SIC 13) have 21 joint ventures on average, many related to oil and gas pipelines and developing oil and gas fields. Similarly, utilities (SIC 49) have many joint ventures relating to power generation and distribution and real estate firms (SIC 65) have many joint ventures related to land development and project management.

[Table 1 about here.]

The effect of joint ventures on the venturers' financial statements

Table 2, Panel A presents the percentages of the venturers' accounts (assets, liabilities, sales, and expenses) that are attributable to the proportionately consolidated joint ventures. Joint ventures appear to be economically significant as represented by their effect on the venturers' financial statements. On average, the joint ventures contribute 10.3 percent of the venturers' current assets, 10.65 percent of total assets, 6.2 percent of current liabilities, and 10.5 percent of total liabilities. Also on average, the joint ventures generate 10.4 percent of the venturers' sales and 8.9 percent of the venturers' expenses. Median values are about one-half the means indicating positive skewness in size. Many joint ventures contribute little (the 10th percentile equals .01 percent) to the venturers' assets, liabilities, sales and expenses. At the 90th percentile, the joint ventures contribute 29 percent of venturer total assets and 35.4 percent of total liabilities.

[Table 2 about here.]

Canadian reporting standards require that firms present footnote disclosure detailing the proportions of the accounts attributable to joint ventures. However, the degree of disclosure varies widely with the venturer's involvement in the joint venture.¹⁰ Therefore, the total number of venturers in each category is less than the 78 venturers represented in the initial sample. For example, fewer venturers disclose joint venture current assets (63) and joint venture current liabilities (61) than report joint venture total assets (73) and joint venture total liabilities (76). Similarly, only 69 venturers report income (sales and expenses) from their joint ventures. Some joint ventures represent non-operating investments.

Panel B of Table 2 presents the percentages of joint venture income and cash flows that are positive and the percentages that are negative. The majority of joint ventures (77.2 percent) contributed positive income to the venturers' income over our examination period. Venturers also generally reported positive incomes (83.5 percent). Similarly, most joint ventures generate positive operating cash flows (82.1 percent), contributing to the venturers' overall positive cash flows (88.2 percent). The joint ventures and the venturers most frequently have negative investing cash flows, 76.4 percent and 90.9 percent respectively. Joint venture financing cash flows are positive in 57.5 percent of the firm years in the sample.

In summary, joint ventures are, on average, a significant portion of the venturers' total assets, liabilities, sales and expenses. On average, joint ventures generate positive income and operating cash flows, and therefore boost reported earnings and operating cash flows for the venturers. As well, average cash flows from investing activities are negative and cash flows from financing activities are positive, suggesting the joint ventures are ongoing investments for the venturers.¹¹

¹⁰ The footnote presented in Appendix A (Armbro Enterprises Inc. 2000) is one of the more detailed footnotes observed in our sample.

¹¹ This is not surprising since failing or unproductive joint ventures are likely to be abandoned or taken over by one of the venturers.

Financial statement effects: Proportionate consolidation versus the equity method

In this section we compare proportionate consolidation financial statement ratios to equity method financial statement ratios. The equity method would present an investment at its net book value (i.e., venturer share of joint venture assets – venturer share of joint venture liabilities) on the venturers’ balance sheet. Therefore, we calculate pro-forma equity method balance sheets from proportionate consolidation balance sheets by subtracting joint venture liabilities from the venturers’ joint venture assets and from the venturers’ total liabilities. Figure 1 illustrates the conversion procedure for proportionate consolidation balance sheets.

Venturer Balance Sheet						
Other Assets	+	Joint Venture Assets	=	Other Liabilities	+	Joint Venture Liabilities + Shareholders’ Equity
		- Joint Venture Liabilities			-	Joint Venture Liabilities
Other Assets	+	Equity in Joint Ventures	=	Other Liabilities	+	Shareholders’ Equity

Figure 1. Converting Proportionate Consolidation Balance Sheets to the Equity Method

Similarly, the equity method would present the income from the joint venture at its net value (i.e., venturer share of joint venture revenues – venturer share of joint venture expenses) on the venturers’ income statement. Therefore, we calculate equity method income statements from proportionate consolidation income statements by subtracting joint venture expenses from the venturers’ joint venture revenues. Figure 2 illustrates the conversion procedure for proportionate consolidation income statements.

Venturer Income Statement								
Other Revenues	-	Other Expenses	+	Joint Venture Revenues	-	Joint Venture Expenses	=	Net Income
			-	Joint Venture Expenses	+	Joint Venture Expenses		
Other Revenues	-	Other Expenses	+	Income from Joint Venture			=	Net Income

Figure 2. Converting Proportionate Consolidation Income Statements to the Equity Method

Table 3 presents our comparisons of venturer financial ratios calculated using proportionate consolidation with the same ratios calculated as if the firms had used the equity method. The first row compares joint venture assets to venturer total assets ratios under the two methods. Both mean and median joint venture assets to venture total assets ratios are significantly larger (at p-values < .0001) under proportionate consolidation. The joint ventures average 12.3 percent of total venture assets under proportionate consolidation (median = 6.61 percent) but only 5.93 percent of total venturer assets under the equity method (median = 2.16 percent).

[Table 3 about here.]

The second row in Table 3 compares venturer total liabilities to venturer total assets (debt to assets ratios) under proportionate consolidation and the equity method. Both the mean and median debt to assets ratios are significantly larger (at p-values < .05) under proportionate consolidation. The mean (median) debt to assets ratio equals 52.26 (55.43) percent under proportionate consolidation and 49.07 (51.84) percent under the equity method.

Current ratios (current assets ÷ current liabilities) under the two methods are shown in the third row of Table 3. The mean (median) current ratios are larger under the equity method but

not significantly so. The mean (median) current ratio equals 2.35 (1.58) times under the equity method and 2.10 (1.54) times under proportionate consolidation.

Rows 4 through 6 of Table 3 compare the ratios of venturer sales to total venturer assets (Asset Turnover), venturer net income to sales (Profit Margin) and venturer net income to total assets (Return on Assets).¹² Mean and median sales to total assets ratios (row 4) are slightly greater under proportionate consolidation (.95 and .78) than under the equity method (.92 and .76) but the difference is not statistically significant. Lower sales reported under the equity method are offset by lower reported assets when calculating sales to asset ratios. Mean and median net income to sales ratios (row 5) and net income to assets ratios (row 6) are smaller under proportionate consolidation than under the equity method. The former difference is marginally significant (p -values $< .09$). In both these ratios sales and total assets are lower under the equity method while net income is the same.

The results shown in Table 3 suggest that current year proportionate consolidated and equity method financial statements can differ significantly in terms of total assets, total debt and profit margin. In the next section we examine whether the differences in ratios also affects predictions of future ratios.

4. Predictive ability: Proportionate consolidation versus the equity method

Background

We use basic financial statement analysis techniques to compare the relevance of financial statements prepared under proportionate consolidation with financial statements prepared under the equity method. Financial statement relevance typically refers to decision usefulness, which in turn, often refers to the ability of current and past financial statement data to predict future investment returns. Prior research shows that the investment returns are related to firm

¹² To avoid combining net incomes with net losses we include only positive incomes for the profit margin and return on assets ratios. Including venturer net losses reduces the means of the ratios to near zero, thereby underestimating the general contribution joint ventures make to venture income.

profitability (Ball and Brown 1968; Ou and Penman 1989) and to firm risk. Figure 3, from Stickney and Weil (1994, p. 272), illustrates the relationship between financial statements, investment decisions, and expected return.

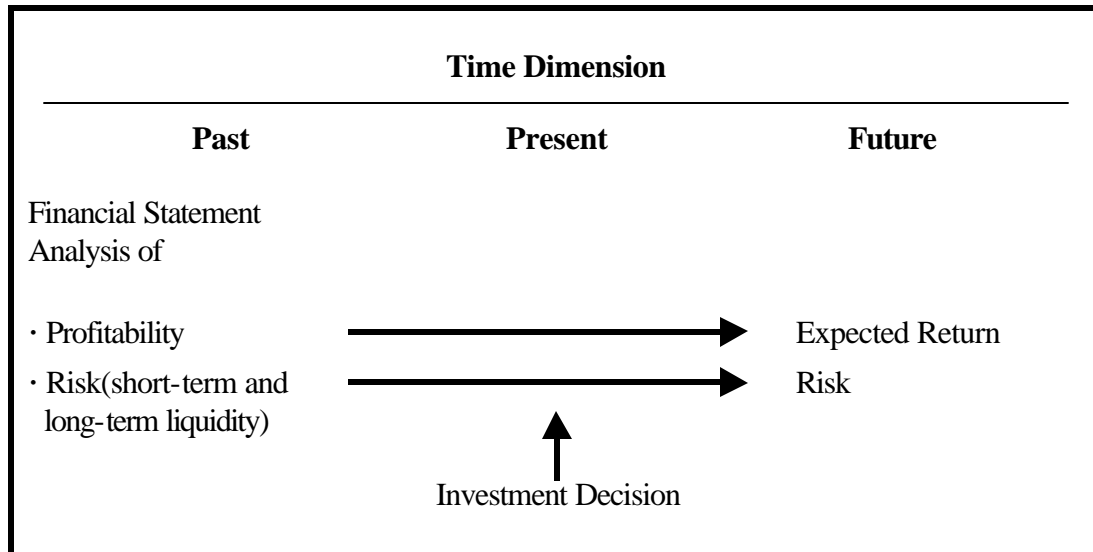


Figure 3. Relation between Financial Statement Analysis and Investment Decisions

Research design

We focus our study on an analysis of past and present profitability, relying on the well known Return on Investment (ROI) or Dupont Model. The DuPont Model disaggregates the rate of return on common shareholders' equity (ROCSE) into the components; profit margin, asset turnover and leverage ratio. Figure 4 illustrates the relationships and calculations of the ROI model.

Return on Common Shareholders' Equity	=	Profit Margin	x	Total Assets Turnover	x	Leverage Ratio
Return on Common Shareholders' Equity	=	$\frac{\text{Net Income}}{\text{Average Common Shareholder's Equity}}$				
Profit Margin	=	$\frac{\text{Net Income}}{\text{Sales}}$				
Total Assets Turnover	=	$\frac{\text{Sales}}{\text{Average Total Assets}}$				
Leverage Ratio	=	$\frac{\text{Average Total Assets}}{\text{Average Common Shareholder's Equity}}$				

Figure 4. Formulas for the Return on Shareholders' Equity Ratios

The ratios are calculated twice, first using the data from the venturers' reported financial statements (under proportionate consolidation) and second after converting the venturers' financial statements to the equity method. ROCSE under proportionate consolidation equals ROCSE under the equity method because both net income and shareholders' equity are the same regardless of joint venture accounting method. However, average assets and average liabilities are smaller under the equity method since they are both reduced by the joint venture liabilities and total sales are smaller since joint venture sales are not included with other venturer sales. Therefore, the disaggregated components of ROCSE, profit margin, total assets turnover, and the leverage ratio, will differ between proportionate consolidation and the equity method.

We examine the predictive ability of the components of ROCSE using the following regression model:

$$\begin{aligned} \text{Return on Common Equity}_t = & \hat{\alpha}_{(t-i)} + \hat{\alpha}_1 \text{Profit Margin}_{(t-i)} \\ & + \hat{\alpha}_2 \text{Asset Turnover}_{(t-i)} \\ & + \hat{\alpha}_3 \text{Leverage Ratio}_{(t-i)} + e \end{aligned} \quad (1A)$$

where t is a year representing a reporting year and i represents either one, two, or three years prior to the reporting year t . The regression is run for each year (i.e., $t-1$, $t-2$, or $t-3$) and for each accounting method.¹³

Predictive ability implies a relation between reporting year and prior year financial statement data. Therefore, if the predictive ability of financial statements under proportionate consolidation differs from the predictive ability under the equity method, then the explanatory power of regressions under the two methods should also differ.¹⁴

4. Results

Descriptive statistics

Panel A of Table 4 presents descriptive statistics of the variables in the year $t-1$ ROCSE regression. The variables presented represent ROCSE for a reporting year t and same-firm Profit Margin, Asset Turnover, and Leverage Ratios for prior reporting year $t-1$. Three years of balance sheet data and two years of income statement data are required to calculate year t ROCSE and year $t-1$ asset turnover and leverage ratios. 123 firm-year observations are available for the year $t-1$ ROCSE regression.

[Table 4 about here.]

¹³ We ran similar regressions using reporting year return on assets and prior reporting years' profit margins (after interest) and asset turnover ratios with results similar to the ones presented later in Table 5.

¹⁴ To connect the ROCSE components with economic value we also tested for an association between the reporting year ROCSE components and the venturers' twelve month cumulative monthly share price return ending three months after the venturers' year ends (not shown). The adjusted R^2 equaled .11 for the regression containing proportionate consolidation variables and .08 for the regression containing equity method variables.

The mean (median) ROCSE equals 4.5 percent (6.9 percent) with a standard deviation of 17.3 percent. Of note is the difference in the profit margin distributions under the two methods. The mean profit margin under proportionate consolidation equals 1.6 percent, the median profit margin equals 11.6 percent and the standard deviation equals 23 percent. The mean profit margin under the equity method equals -38 percent, the median equals 4.3 percent and standard deviation equals 335 percent. The very large variation in the equity method profit margin ratio can be attributed to firms whose joint venture sales are a large proportion of total sales. Thus the subtraction of the joint venture sales dramatically reduces a ratio that has sales as a denominator and a constant for a numerator.

Asset turnover under the two accounting methods, proportionate consolidation and the equity method, has similar means (1.05, 1.00), medians (.817, .794) and standard deviations (.868, .855). The mean (median) leverage ratio under the proportionate consolidation method equals 2.46 (3.66) and 2.27 (2.12) under the equity method. Subtracting joint venture liabilities from venturer liabilities causes the equity method leverage ratio to be smaller than the proportionate consolidation leverage ratio.

Panel B of Table 4 presents Pearson correlation (r_p) coefficients of the variables in the year t-1 regression. The proportionate consolidation and equity method reporting year t-1 profit margins and asset turnover ratios are significantly correlated with reporting year t ROCSE. Proportionate consolidation profit margin shows a higher correlation with ROCSE ($r_p = .5817$, p-value $< .0001$) than does equity method profit margin ($r_p = .4359$, p-value $< .0001$). The proportionate consolidation and equity method asset turnover ratios are also significantly correlated with ROCSE ($r_p = .2594$ and $.2578$, p-values $< .0040$).

The two asset turnover variables are highly correlated with each other ($r_p = .9880$, p-value $< .0001$) suggesting little difference between these ratios. Similarly, the two leverage ratios are highly correlated with each other ($r_p = .9317$, p-value $< .0001$). The profit margin ratios are

significantly correlated with each other ($r_p = .7703$, $p\text{-value} < .0001$), but less so than are the asset turnover and leverage ratios.

Only the denominator is affected when converting the profit margin from proportionate consolidation to the equity method (reducing sales). However, both the numerator and the denominator are affected when converting the asset turnover (reducing sales and average assets) and leverage ratios (reducing average assets and average liabilities). Therefore it should not be surprising that the proportionate consolidation and equity method asset turnover and leverage ratios are highly correlated and that any differences between the two accounting methods will be found primarily with profit margin.

ROCSE regression results

Table 5 presents the results of our regressions of reporting year ROCSE on prior year disaggregated ROCSE variables.¹⁵ The first row shows the relations between reporting year (t) ROCSE and one year earlier (t-1) profit margin, asset turnover, and leverage ratios calculated under the proportionate consolidation and equity methods. The second (third) row shows the relation between reporting year t ROCSE and year t-2 (t-3) profit margin, asset turnover, and leverage ratios. The explanatory power, measured by adjusted R-square, of each of the regressions under proportionate consolidation exceeds the explanatory power of its comparable year regression under the equity method. For the year t-1 regression, proportionate consolidation

¹⁵ The correct functional form for the regression of ROCSE on profit margin, asset turnover, and leverage is, of course, multiplicative which is usually accomplished by logging the variables on both sides of the regression model. We performed that analysis; however, our data contains a significant number of cases with negative profit margin (and hence, negative ROCSE). These observations are eliminated when logs are taken. Further, these cases are most prevalent where the differences between proportionate consolidation and equity method are greatest. That is, netting the effects of joint venture revenues and expenses can have large effects on venturer profit margins. Hence, we use a linear model. Under the log model (based on 88 observations) we find the coefficients on profit margin and asset turnover are significantly positive while the coefficient on leverage is negative but not significant (similar to the results from the linear model). Further, under the log model with reduced observations, we find the accounting ratios under proportionate consolidation explain more than under the equity method, that difference is not statistically significant. We believe that result is due to exclusion of perhaps the most interesting cases, those where the accounting differences produce the greatest differences in the ratios.

results in an adjusted R^2 of .38 compared to an adjusted R^2 of .23 for the equity method. A general linear test shows that the proportionate consolidation ratios provide significant incremental explanatory power for ROCSE over that provided by the equity method ratios ($F = 10.157$, $p\text{-value} < 0.01$).¹⁶ The absolute magnitude of the adjusted R^2 's declines with the t-2 regressions as does the relative difference in explanatory power between the proportionate consolidation and equity method regressions. Even so, the proportionate consolidation ratios provide significant incremental explanatory power ($F = 3.9421$, $p\text{-value} < .025$). The year t-3 regressions show very high explanatory power ($R^2 = .90$ and $R^2 = .86$) as well as significant incremental explanatory power from the PC variables ($F = 3.5296$, $p\text{-value} < .05$).¹⁷ However, only 30 observations are available for the t-3 regressions.

[Table 5 about here.]

We used the same general linear test to detect whether the equity method ratios provided any incremental explanatory power over that provided by the proportionate consolidation ratios. The results show that the equity method ratios provide no significant incremental explanatory power in the t-1 ($F = 0.39$; $p > 0.70$), t-2 ($F = 0.63$; $p > 0.50$), and t-3 ($F = 0.37$; $p > 0.70$) regressions. Taken together, these results suggest that the proportionate consolidation ratios subsume virtually all of the predictive power in the equity method ratios and provide significant incremental predictive power beyond that of the equity method ratios.

5. Summary and conclusions

¹⁶ The test is the general linear test explained in Neter, Wasserman, and Kutner (1983, pg. 95) that compares full and reduced model regressions. The full model includes all proportionate consolidation and equity method variables. The reduced model includes only the equity method independent variables. The comparison tests whether significant additional variance in the dependent variable, in our case ROCSE, is explained when the PC variables are included with the Equity method variables. A significant F statistic indicates significant incremental explanatory power.

¹⁷ The regressions appear well-behaved. We performed conventional influence diagnostics as described in Belsley, Kuh, and Welsch (1980) and did not find any observations that had R-student values greater than 2, suggesting that our results are not driven by a few influential observations. Also, tests of heteroscedasticity did not show any regressions with χ^2 at p-values significant at the .10 level. However, multicollinearity remains an issue and conclusions regarding estimated coefficients may be precluded.

In this study we document financial statement differences when joint ventures are accounted for by the proportionate consolidation and equity methods of accounting. We collect data and disclosures of Canadian firms with proportionately consolidated joint ventures and document the types of venturers that report ownership in joint ventures, the strategic nature of the joint ventures and the contribution of the joint ventures to the venturers' financial statements. With data from the disclosures we calculate pro-forma equity method financial statements and compare the results with venturers' proportionately consolidated financial statements. Then we examine the association between prior year financial statement ratios calculated under proportionate consolidation and under the equity method with subsequent year ratios.

Worldwide accounting practices for joint ventures vary between proportionate consolidation and the equity method. Proportionate consolidation is used to account for joint ventures in Canada and continental Europe and is preferred by International Accounting Standards. The equity method is used in the United States, England, Japan and Australia. By comparing venturer firms' financial statements prepared using proportionate consolidation with the same firms' financial statements prepared using the equity method, we provide direct evidence of some effects of joint venture accounting methods. Our results should provide evidence relevant to discussions of joint venture accounting.

In Canada, unlike other countries, joint ventures represent investments that are jointly controlled. Venturers are found in most industries but are most common in the extraction and utilities industries where companies share in exploration and development projects. On average, the joint ventures contribute approximately ten percent to venturers' total assets and sales, twelve percent to venturers' total liabilities, and nine percent to venturers' total expenses. Joint venture income and operating cash flows are predominantly positive and investing cash flows predominantly negative.

The results of our study suggest there is some predictive value to the proportionate consolidation method over the equity method when joint ventures are defined as they are in Canada. Our analysis indicates stronger relations between return on common shareholders' equity and prior-year disaggregated components (profit margin, asset turnover, and the leverage ratio). Furthermore, we find a stronger relation between current and prior-year components of return on equity and current year stock returns. The stronger relations appear primarily related to profit margin as the absence of joint venture sales when using the equity method dramatically increases the variance of the profit margins of firms with relatively high levels of sales from their joint ventures.

In 1999, the FASB issued a G4+1 report *Reporting Interests in Joint Ventures and Similar Arrangements*. The authors, although recommending that all joint ventures be reported using the equity method, note the absence of empirical evidence on the relevance of one accounting procedure over the other (Milburn and Chant 1999). Results of our study suggest that proportionate consolidation should continue to be considered an appropriate method of accounting for joint ventures, at least for joint ventures defined by shared control.

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Appendix A: Example of a Joint Venture disclosure: Armbro Enterprises Inc. 2000

24 ARMBROENTERPRISES INC. 2000

4 JOINT VENTURES

The Company participates in several incorporated and unincorporated joint ventures and the consolidated financial statements include the Company's proportionate share of the assets, liabilities, revenues, expenses, net income and cash flows of these joint ventures.

(a) The following table sets out the Company's proportionate share of the assets, liabilities, venturers' equity, revenues, expenses, net income and cash flows of these joint ventures.

	2000	1999
Assets		
Current	\$ 135,051	\$ 84,890
Capital	26,202	3,253
Other	1,428	1,812
	\$ 162,681	\$ 89,955
Liabilities		
Current	\$ 151,271	\$ 69,997
Long-term	6,250	473
Venturers' equity	5,160	19,485
	\$ 162,681	\$ 89,955
Revenues	\$ 298,286	\$ 35,038
Expenses	305,917	27,531
Net income (loss)	\$ (7,631)	\$ 7,507
Cash flows from		
Operating activities	\$ 36,886	\$ 4,597
Investing activities	(1,312)	(3,512)
Financing activities	8,079	(777)
	\$ 43,653	\$ 308

(b) The Company is either contingently or directly liable for obligations of its joint venturers. The assets of the joint ventures are available for the purpose of satisfying such obligations.

(c) The Company enters into transactions in the normal course of operations with its joint ventures, which are measured at the exchange amount being the amount of consideration established and agreed to by the parties involved. During the year, the Company generated revenues of \$13,914 (1999 – \$297) from its joint venture partners. At December 31, 2000, the Company has included in accounts receivable \$15,641 (1999 – \$9,110) owing from its joint venturers. At December 31, 2000, the Company has included in accounts payable and accrued liabilities \$556 (1999 – \$ nil) owing to its joint venturers.

Table 1**The Distribution of Proportionately Consolidated Joint Ventures Across Industries¹**

Industry 2-digit SIC Code	Number of ²	
	Venturers	Joint Ventures
<i>Natural Resources</i>		
08: Forestry	1	1
09: Fishing	2	2
<i>Extraction</i>		
10: Minerals	7(6)	19
13: Oil & Gas	4	85
14: Nonmetallic Minerals	2(1)	(M)
<i>Construction</i>		
15 General Building	1	2
16 Heavy Construction	1	(M)
<i>Manufacturing</i>		
24: Lumber and Wood Products	4	8
26: Paper and Allied Products	4	12
27: Printing and Publishing	2(1)	1
28: Chemicals and Allied Products	4	6
32: Stone, Clay, Glass, and Concrete Products	1	(M)
33: Primary Metal Industries	2(1)	1
36: Electrical and Electronic Equipment	4(3)	18
37: Transportation Equipment	3(2)	3
38: Instruments and Related Products	1	(M)
<i>Miscellaneous Transportation Services</i>		
44: Water Transportation	2	11
45: Transportation By Air	1	3
48: Communications	4(2)	5
<i>Utilities</i>		
49: Electric, Gas, and Sanitary Services	7(6)	33
<i>Wholesale Trade</i>		
50: Wholesale Trade-Durable Goods	3(2)	3
51: Wholesale Trade-Non-Durable Goods	1	(ND)
<i>Real Estate</i>		
65: Real Estate	8(3)	19
67: Holding and Other Investment Offices	1	(M)
<i>Services</i>		
70: Hotels and Resorts	1	4
73: Business Services	1	(ND)
78: Motion Pictures	2(1)	(M)
80: Health Services	1	1
87: Engineering, Accounting & Mgmt Services	3(1)	3
Total Venturers / Described Joint Ventures:	78	163

¹ Venturers are Canadian firms reporting proportionately consolidated joint ventures.

² (n) presents the number of owners providing details on their joint ventures (i.e., 6 of the 7 owners in 2-digit SIC code 10 provided information on the number of their joint ventures), (M) represents multiple unspecified joint ventures and (ND) that no descriptions about the joint ventures were reported.

Table 2
The Contribution of Proportionate Consolidated Joint Ventures to Venturer Financial Statements¹

Panel A: The Percentage Contribution of the Joint Ventures to the Venturers' Assets, Liabilities, Sales, and Expenses

	N ²	n	Mean	Std Dev.	90 th	Percentiles	
						50 th	10 th
Joint Venture Current Assets ÷ Venturer Current Assets	63	248	10.30%	14.40%	30.40%	4.62%	0.01%
Joint Venture Total Assets ÷ Venturer Total Assets	73	297	10.65%	14.33%	28.98%	5.24%	0.01%
Joint Venture Current Liabilities ÷ Venturer Current Liabilities	61	234	6.17%	11.06%	17.85%	2.29%	0.01%
Joint Venture Total Liabilities ÷ Venturer Total Liabilities	76	304	12.46%	17.48%	35.44%	5.96%	0.01%
Joint Venture Sales ÷ Venturer Sales	69	281	10.38%	17.30%	26.66%	3.38%	0.01%
Joint Venture Expenses ÷ Venturer Expenses	69	281	8.87%	13.13%	21.49%	3.46%	0.01%

Panel B: Percentages of Positive and Negative Earnings and Cash Flows

	N	n	Joint Ventures	Venturers
Income	69	279	77.24%	83.53%
Loss			22.76%	16.47%
Operating Cash Flow - Positive	64	263	82.13%	88.21%
Negative			17.87%	11.79%
Investing Cash Flow - Positive	64	262	23.57%	9.13%
Negative			76.43%	90.87%
Financing Cash Flow - Positive	61	240	57.50%	66.67%
Negative			42.50%	33.33%

¹ Venturers are Canadian firms reporting proportionately consolidated joint ventures.

² N is the number of venturers and n is the number of yearly observations.

Table 3
Comparisons of Financial Ratios of Venturers Using Proportionate Consolidation (PC) with Financial Ratios as if the Venturers Had Used the Equity Method (EQ)¹

Ratio	Accounting			Mean	Std Dev.	90th	Percentiles		Differences Tests ³	
	Method	N ²	n				50th	10th	Means	Medians
Joint Venture Assets ÷ Total Assets (percent)	PC	73	292	12.30	16.06	37.74	6.61	0.01	5.76 (.0001)	5.80 (.0001)
	EQ	73	292	5.93	9.95	15.61	2.16	0.01		
Total Debt ÷ Total Assets (percent)	PC	73	289	52.26	18.41	73.93	55.43	23.33	2.04 (.0208)	2.03 (.0213)
	EQ	73	289	49.07	19.10	71.83	51.84	19.33		
Current Assets ÷ Current Liabilities	PC	61	234	2.10	2.02	3.57	1.54	0.76	-1.20 (.1146)	-0.58 (.2818)
	EQ	61	234	2.35	2.49	4.67	1.58	0.75		
Sales ÷ Total Assets	PC	68	259	0.95	0.80	2.10	0.78	0.18	0.51 (.3040)	0.64 (.2613)
	EQ	68	259	0.92	0.79	2.08	0.76	0.15		
Net Income ⁴ ÷ Sales (percent)	PC	65	226	7.32	7.63	13.77	5.41	1.28	-1.37 (.0860)	-1.28 (.0498)
	EQ	65	226	8.37	8.68	18.15	5.86	1.38		
Net Income ⁴ ÷ Total Assets (percent)	PC	66	231	4.85	3.68	8.87	4.85	1.07	-1.06 (.1439)	-0.87 (.1920)
	EQ	66	231	5.24	4.17	9.44	4.40	1.19		

¹ Venturers are Canadian firms reporting proportionately consolidated joint ventures over the period 1995 - 2000.

² N is the number of venturers and n is the number of yearly observations.

³ t-tests for differences in the means and Wilcoxon tests for differences in the medians (one-tailed p-values in parenthesis).

⁴ Venturers reporting negative net income are excluded.

Table 4
Descriptive Statistics and Correlation Coefficients of Variables in the Return on Equity
Regressions¹

Panel A: Descriptive statistics²

	n	Mean	Std Dev	90 th	Percentiles		
					50 th	10 th	
Proportionate Consolidation	Return on Equity _t	123	.045	.173	.187	.069	-.102
	Profit Margin _{t-1}	123	.016	.230	.116	.040	-.031
	Asset Turnover _{t-1}	123	1.05	.868	2.23	.836	.312
	Leverage Ratio _{t-1}	123	2.40	.853	3.55	2.29	1.45
Equity Method	Profit Margin _{t-1}	123	-.380	3.35	.143	.043	-.031
	Asset Turnover _{t-1}	123	1.00	.855	2.26	.812	.252
	Leverage Ratio _{t-1}	123	2.20	.711	3.15	2.09	1.32

Panel B: Pearson correlation coefficients

	Proportionate Consolidation			Equity Method		
	Profit Margin _{t-1}	Asset Turnover _{t-1}	Leverage Ratio _{t-1}	Profit Margin _{t-1}	Asset Turnover _{t-1}	Leverage Ratio _{t-1}
Return on Equity _t	.5817 (.0001)	.2594 (.0038)	-.0387 (.6712)	.4359 (.0001)	.2578 (.0040)	-.0420 (.6444)
Profit Margin _{t-1}		.0767 (.3994)	.1024 (.2599)	.7703 (.0001)	.0940 (.3010)	.1207 (.1837)
Asset Turnover _{t-1}			.1039 (.2527)	.1141 (.2090)	.9880 (.0001)	.1112 (.2209)
Leverage Ratio _{t-1}				.1717 (.0575)	.1058 (.2440)	.9317 (.0001)
Profit Margin _{t-1}					.1465 (.1058)	.1911 (.0343)
Asset Turnover _{t-1}						.1289 (.1553)

¹ As reported proportionate consolidation and pro-forma equity method financial statements of a sample of Canadian venturer firms with joint ventures over the period 1995 – 2000. Return on Equity equals venturer net income divided by average common shareholders equity. Profit Margin equals net income divided by sales, Asset Turnover equals sales divided by total average assets, and the Leverage Ratio equals average assets divided by average common shareholders' equity. t equals a reporting year and i equals the number of reporting years prior to the reporting year t.

² Correlation coefficients with two-tailed p-values in parenthesis.

Table 5**The Relations between Venturer Return on Common Shareholders' Equity and Prior-Year Profit Margins, Asset Turnovers, and Leverage Ratios under the Proportionate Consolidation and Equity Methods of Accounting for Joint Ventures¹**

$$\text{Return on Common Shareholders' Equity}_t = \hat{a}_{(t-i)} + \hat{a}_1 \text{Profit Margin}_{(t-i)} + \hat{a}_2 \text{Asset Turnover}_{(t-i)} + \hat{a}_3 \text{Leverage Ratio}_{(t-i)} + e$$

i	N	Intercept	Proportionate Consolidation			Adj. R ²	Equity Method			Adj. R ²	
			Profit Margin	Asset Turnover	Leverage Ratio		Intercept	Profit Margin	Asset Turnover		Leverage Ratio
1	123	.049 ² (.2024)	.433 (.0001)	.045 (.0019)	-.024 (.0934)	.38	.091 (.0555)	.022 (.0001)	.043 (.0091)	-.037 (.0632)	.23
F = 10.157, p-value < .0001 ³											
2	71	-.087 (.0303)	.443 (.0001)	.027 (.0749)	.047 (.0029)	.52	-.055 (.2445)	.034 (.0001)	.019 (.2497)	.050 (.0147)	.45
F = 3.941, p-value < .025 ³											
3	30	-.093 (.0762)	.771 (.0001)	.052 (.0164)	.025 (.2252)	.90	-.041 (.5675)	.061 (.0001)	.043 (.1258)	.026 (.4239)	.86
F = 3.530, p-value < .05 ³											

¹ As reported proportionate consolidation and pro-forma equity method financial statements of a sample of Canadian venturer firms with joint ventures over the period 1995 – 2000. Return on Common Shareholders' Equity equals venturer net income divided by average common shareholders equity. Profit Margin equals net income divided by sales, Asset Turnover equals sales divided by total average assets, and the Leverage Ratio equals average assets divided by average common shareholders' equity. t equals a reporting year and i equals the number of reporting years prior to the reporting year t.

² Coefficient estimate with p-value in parenthesis.

³ Results of a test of the significance of the additional explanatory power of the proportionate consolidation independent variables over the equity method independent variables. The test compares full versus reduced model regressions where the full model includes all proportionate consolidation and equity method variables and the reduced model includes only the equity method independent variables.