

THE EFFECT OF RESTATING CANADIAN FINANCIAL
STATEMENTS TO US GAAP ON ACCOUNTING
RATIOS, DEBT RATINGS, AND
MARKET-TO-BOOK VALUES

By

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NOMENCLATURE

AMEX	American Stock Exchange
BV	book value
CBRS	Canadian Bond Rating Service
GAAP	generally accepted accounting principles
H1	Hypothesis 1
H2	Hypothesis 2
MV	market value
<i>MB/BV</i>	market-to-book value
NASDAQ	National Association of Securities Dealers Automated Quotation System
NYSE	New York Stock Exchange
Q1	Question 1
Q2	Question 2
SEC	Securities and Exchange Commission
UK	United Kingdom
US	United States

CHAPTER 1

INTRODUCTION

Substantial diversity exists in accounting practices across countries. However, the international economic environment acts as a stimulus to decrease accounting diversity. Investment opportunities and financial information concerning those opportunities extend across national borders (Saudagaran and Biddle 1992). Some investors seek financial information in a single, nondiverse form, under the belief that such information increases the comparability of investment opportunities (Choi and Levich 1992).

Within the United States (US), the Securities and Exchange Commission (SEC) mandates a single form of financial reporting. The SEC requires foreign companies with stock listed on US exchanges to meet US generally accepted accounting principles (GAAP) in their reporting. Companies are permitted to maintain their primary financial statements in original GAAP. However, they then must prepare a reconciliation of material differences between original and US GAAP.

Importance of the Issue

Although the SEC requires reconciliation to US GAAP, other countries permit foreign companies to list on their stock exchanges using original GAAP.¹ This leniency provides an incentive for foreign companies to raise capital in those countries. There is some evidence substantiating the claim that investment opportunities in the US are lost because of the reconciliation requirement (Saudagaran and Biddle 1992).

¹ The Amsterdam Exchange is one example of an exchange that accepts foreign financial statements with only minor changes. See Saudagaran and Biddle (1992).

As a result, there has been support for deregulation of reconciliation requirements in the US. In recent years, the SEC has become much more accommodating to foreign companies seeking to list in the US (Silkenat 1994; Decker 1994). For example, the SEC now accepts International Accounting Standard Number 7 as equivalent to US GAAP for presenting cash flow statements. It permits a quasi-private placement of securities to qualified institutional buyers through Rule 144A without requiring the reconciliation to US GAAP (Kosnik 1994).

Another possible method of deregulating financial reporting is through multijurisdictional reciprocity agreements in which countries accept the financial reporting practices of each other. Reciprocity has particularly been discussed with respect to the US and Canada because of the presumed similarities between the environments and accounting practices of the two countries. In 1991, Canada and the US tentatively agreed to reciprocity. However, the US reversed its position after a SEC study found substantial differences between US and Canadian GAAP (SEC 1993; *Journal of Accountancy* 1995).

Although the SEC has become more accommodating with other rules, it holds fast to the reconciliation requirement. The requirement reflects the SEC's ongoing philosophy of placing the protection of the US investor foremost in its policies. It is also a leading deterrent for foreign companies entering US markets (Cochrane 1994). The global competition of capital markets is becoming increasingly intense. There is also value in giving US investors an opportunity to purchase foreign investments in US markets. Therefore, it is important to evaluate the usefulness of the reconciliation policy.

Research Objective

The purpose of this study is to determine whether the restatement of Canadian financial statements to US GAAP adds information value. Specifically, it tests the effect of restatements on ratio analysis. Ratios are calculated under both US and Canadian GAAP. The economic significance of the change in ratio values due to restatement is tested for its association with two economic variables: debt ratings and market-to-book values.

The results should provide an increased understanding of the value of the required US GAAP reconciliations to users of accounting information. The study provides results on ratios which are used in many decision contexts. The results also contribute to the ongoing reconciliation-reciprocity debate. It adds to the limited evidence thus far obtained on the impact of US GAAP reconciliations on Canadian companies.

The outline of this thesis is as follows. The theoretical framework for reconciliations is introduced in Chapter 2. The section includes a discussion of how the ongoing rhetoric supporting or opposing reconciliation fits within the framework. Chapter 3 presents a brief history of SEC reconciliation policy and the changing views regarding US and Canadian accounting differences. Included in this discussion is a review of reconciliation research. Chapter 4 introduces ratios as the variables used to test for the effects of reconciliation and describes the data collection process. Chapter 5 develops the descriptive analysis and hypotheses used to test for the information value of reconciliations. The results are discussed in Chapter 6. Chapter 7 concludes with a discussion of implications, limitations, and extensions of the study.

CHAPTER 2

RECONCILIATION VERSUS RECIPROCITY: A THEORETICAL FOUNDATION

Information can be described as a quality that influences decisions. A prominent role of accounting is to provide information for decision making (Beaver 1981). If accounting information has value, it should result in decisions preferred to those decisions made without the information. Therefore, for the reconciliation of accounting practices to US GAAP to have information value, it should result in decisions preferred to those made on the basis of unreconciled information only.

Information economics theory can be used to examine the conditions in which reconciliations possess information value.² An information system is a signal-generating mechanism that is intended to clearly reveal the state of nature. The more successful an information system is in achieving this objective, the more useful the information. To illustrate the usefulness of an information system, let $N1$ represent an information system that points to a set of S states of nature by means of a set of Y signals. In the following simple information system $N1$:

$$\begin{aligned}N1(s1) &= y1 \\ N1(s2) &= y2 \\ N1(s3) &= y2 \\ N1(s4) &= y2\end{aligned}$$

two signals ($y1, y2$) point to four states of nature ($s1, s2, s3, s4$). This information system is imperfect because more than one state is associated with one of the signals. Signal $y1$ clearly points to state $s1$. However, if signal $y2$ is generated, it is impossible to determine

² See Strong and Walker (1987) for an extensive discussion of information economics theory.

which of s_2 , s_3 , and s_4 is the correct state. The signals in information system N_1 partition S as follows: $\{\{s_1\}\{s_2,s_3,s_4\}\}$.

A second partition of S is said to be finer than the first partition if every element of its partition is a subset of the first partition. For example, assume the existence of a second information system N_2 in which signal y_1 points to s_1 , signal y_2 to s_2 and s_3 , and signal y_3 to s_4 . Since every element in the resulting $\{\{s_1\}\{s_2,s_3\}\{s_4\}\}$ partition of S is a subset of the partition generated by N_1 , N_2 is a finer information system than N_1 . The Fineness Theorem states that for two distinct information systems N_1 and N_2 , N_2 will be preferred to N_1 if and only if the partition induced by N_2 is finer than the partition induced by N_1 . If the partitioning resulting from N_2 is not finer than the partitioning resulting from N_1 , it is possible that some individual will prefer N_1 to N_2 .

To illustrate the preferability of a finer information system, assume the four states of nature in the previous example represent the following levels of economic profitability for a company: s_1 = high profitability, s_2 = medium profitability, s_3 = low profitability, and s_4 = bankruptcy. Under information system N_1 , if signal y_2 is generated, it is unknown whether the company has medium profitability, low profitability or is bankrupt. The occurrence of signal y_2 in information system N_2 , however, limits the possible states to medium or low profitability. A third signal, y_3 , clearly identifies bankruptcy. Therefore, N_2 has greater information value than N_1 .

Information systems also produce signals that permit comparisons of multiple companies. For example, assume the following three states of nature about Companies A and B: s_1) Company A is more profitable than Company B, s_2) Company A and Company B are equally profitable, and s_3) Company A is less profitable than Company B.

Assume that an information system N_3 produces no signals to allow a comparison of the two companies. It provides the same signal y_1 for all possible states resulting in no partitioning of S beyond $\{s_1, s_2, s_3\}$. However, another information system N_4 provides two signals which results in the following partitioning of S : $\{\{s_1\}\{s_2, s_3\}\}$. The finer partitioning available from N_4 permits greater comparability of Companies A and B.

The concept of fineness relates directly to the reconciliation-reciprocity issue. Foreign companies prepare financial reporting (denoted as N_F) to comply with the requirements of the country in which they are headquartered. When these companies list on US exchanges, they also prepare reconciled reporting (N_{US}), which reconciles financial reporting to US GAAP. As a result, N_{BOTH} reporting is disclosed, consisting of N_F union N_{US} . If the increased disclosures produce additional signals, N_{BOTH} may result in a finer partitioning of the states of nature.

Note that for N_{BOTH} to provide more information than N_F , it is not necessary that N_{US} provide more information than N_F . It is only necessary that US GAAP provide incremental information to the information already available in original GAAP. It is important to differentiate *relative* information from *incremental* information.

Relative information denotes that an information system produces *more* signals than another information system. To possess relative information is a stricter requirement than to possess incremental information. Even if it does not have relative information value, however, N_{US} still may have incremental value (Biddle et al. 1995).

Incremental denotes that something is being added to what was available before. Therefore, if US GAAP provides incremental information, it produces signals in addition to those produced in Canadian GAAP. It is also possible that Canadian GAAP provides

additional signals to US GAAP. Therefore, both forms of GAAP can simultaneously provide incremental information to each other. If N_{US} possesses incremental information beyond N_F , then N_{BOTH} will possess relative information over N_F .

There is no question that SEC-mandated reconciliations result in a greater volume of accounting numbers than is reported in original GAAP only. However, if the increased disclosures provide no additional signals to those available in original GAAP, they have no information value. If US GAAP produces additional signals, it provides incremental information to that information provided in Canadian GAAP.

Arguments Supporting Reconciliation

Several arguments have been made in support of the reconciliation requirement. First, one form of GAAP may produce more signals than another form of GAAP. Former SEC Chairman Richard Breeden essentially supported this argument for reconciliation when he stated: “Without this protection investors might select a foreign stock . . . only to discover later that differences in accounting or auditing standards made the foreign stock look better” (Salwen 1991). The implication is that the more stringent disclosures required in US GAAP produce additional signals which increase the value of the information.

Second, some foreign companies resist providing reconciliations while other companies accept the costs involved in preparing reconciliations, because they are motivated by the financing benefits available in US stock markets. For some companies seeking additional sources of financing, the resistance to reconciliations may represent evidence that the information would produce negative signals if available.

Third, comparability is often mentioned as an important quality for information usefulness. The commitment to achieving greater comparability is one of the leading motivations worldwide for efforts to reduce accounting diversity. The reconciliation of N_F to N_{BOTH} results in both foreign and US companies providing disclosures in US GAAP. The commonality of disclosures may produce additional signals which enhance the comparability of companies from different countries.

Arguments Supporting Reciprocity

Supporters of reciprocity have also made several arguments. First, the fact that US GAAP requires additional disclosures than is required in other countries does not necessarily mean these disclosures produce additional signals. In particular, it is asserted that the GAAP of other countries is usually of high quality and that stocks are generally priced based on the original reporting made in the home country. According to this argument, providing the reconciliation to US GAAP will not result in a finer partitioning of states than is already available in original GAAP. Therefore, investors are fully protected with existing disclosures (Cochrane 1994).

Second, environmental factors directly affect the economic condition of companies. Environmental factors include macroeconomic conditions, government influence (e.g., tax policy), and the business culture in which the company operates. These factors also affect the interpretation of accounting information. Even if companies from different environments disclose accounting information in the same GAAP, comparability of companies may still not be achieved.

One example of this environmental influence is the effect that hyperinflation can have on the interpretation of accounting information. Extreme inflation has a direct economic effect on companies. Some form of inflation-adjusted accounting is generally used to disclose the effect of hyperinflation. A historical cost accounting system would not adequately reveal the effect of inflation. Therefore, the reconciliation of hyperinflation accounting information to a historical cost information system would not be expected to produce additional signals to increase information value.

Third, some information is confidential in nature. The disclosure of such information may not merely act as a signal, but could cause a weakening of the company relative to its competitors. Company management may justify keeping some information private even if it contains information value.

Ultimately, whatever additional signals are produced by reconciliation must be weighed against the costs of providing the signals. It is possible that isolating the costs of reconciliation to one party (the company) reduces duplication efforts for others and results in lower aggregate costs. However, it is also possible that excessive preparation costs may be prohibitive, particularly for smaller companies (SEC 1995).

In conclusion, arguments are offered on both sides of the reconciliation-reciprocity debate. However, it is not possible based on the theoretical framework alone, to establish whether the additional disclosures provide incremental information. Ultimately, the question of whether US reconciliations provide incremental information for decision-making purposes must be tested empirically. Previous empirical research is closely linked to US regulatory policy. The next section traces the development of US regulatory policy and reconciliation-based research.

CHAPTER 3

HISTORICAL DEVELOPMENT OF RECONCILIATION

US Reconciliation Policy

SEC regulation policy is built upon the commitment to protect the investor (SEC 1979). SEC regulations are strict and detailed compared to requirements of other countries. In order to list on US stock exchanges, foreign companies must report financial information according to US GAAP. US GAAP requirements may be met in one of two ways: 1) companies may provide financial statements using US GAAP as the primary GAAP or 2) companies may continue to report financial statements in original GAAP, but include a reconciliation of material differences from US GAAP. Most companies choose the second option and provide reconciliations. The reconciliation is filed on SEC Form 20-F. Form 20-F requires a detailed breakdown of the GAAP differences needed to reconcile original GAAP income to US GAAP income. It also requires disclosure of balance sheet differences, but allows greater flexibility in the manner those differences are presented (SEC 1995).

Although some Canadian companies fall within the jurisdiction of Form 20-F, the SEC places many Canadian companies in a special status separate from other foreign companies. For regulatory purposes, some Canadian companies are treated as US companies (SEC 1979; 1989). As a result, many Canadian companies file the same Form 10-K that is required of US companies. Canadian companies that file 10-Ks also furnish reconciliations to US GAAP (Bandyopadhyay et al. 1994).

As a practical matter, there is great variability in how companies adhere to SEC reconciliation requirements. Companies are only required to furnish reconciliations if there are material differences from US GAAP. When material differences do exist, few companies restate the entire financial statements. Most companies provide a clear breakdown of the material differences in income. Often, however, there is considerable variability in the reconciliation disclosures of the balance sheet. Some companies furnish totals of some of the main categories of assets, liabilities, and equity. Others provide details of only part of the balance sheet, such as stockholders' equity. Frost and Pownall (1994) document that many foreign companies fail to meet all SEC reporting requirements.

Classification of Accounting Practices

As stated earlier, the SEC treats many Canadian companies as equivalent to US companies for regulatory purposes. The special treatment for Canadian companies reflects the commonly held belief that the accounting practices and business environment of Canada and the US are nearly identical. Numerous studies have compared the business culture and accounting practices of countries throughout the world. Hofstede (1980) classifies the national culture of many countries, including the US and Canada, according to four dimensions: uncertainty avoidance, individualism, power distance, and masculinity. He finds the US and Canada to be culturally similar with respect to all four dimensions. Hofstede classifies the US and Canada as part of the same *Anglo* cluster of countries.

Using Hofstede's results, Gray (1988) classifies accounting practices of countries according to the degree of statutory control or professionalism, flexibility or uniformity, transparency or secrecy, conservatism or optimism. Canada and the US are classified similarly in this analysis.

Several approaches have been used to classify accounting practices across countries (Radebaugh and Gray 1993). One approach is to deduce the likely classifications of accounting practices based on the environmental forces that influence accounting. Based on a review of environmental factors, Mueller (1968) classifies Canada and the US in the same group. Using a similar approach, Nobes (1983) combines Canada and the US in a grouping that contains only those two countries.

A second approach is to inductively classify countries based on observed accounting practices. During the 1970s, Price Waterhouse & Co. published surveys of accounting practices throughout the world. For example, the 1973 report discussed 233 accounting practices in 38 countries. Frank (1979) and Nair and Frank (1980) use this data set with statistical analysis to cluster countries by similarity of accounting practice. A study by Douppnik and Salter (1995) also groups countries by accounting similarities. Canada and the US are classified together in each of these studies.³

Douppnik (1987) uses factor analysis with two Price Waterhouse data sets to group countries by accounting practices. This study places Canada and the US in different accounting clusters. Two testing periods are reported in the study. In the first, the US is placed in the same cluster with Mexico. In the second, Canada is clustered with Mexico.

³ In Nair and Frank (1980), Canada and the US are grouped together in three out of four analyses.

Although Canada and US are clustered separately, the link of both countries with Mexico suggests that there are similarities in US and Canadian accounting practices.

Overall, the early research supports the belief that Canadian and US accounting practices are similar. For example, in a history of Canadian financial reporting, Murphy (1988) reports that through the early 1960's Canadian GAAP was strongly influenced by US GAAP. Unless the Canadian Institute made its own pronouncement, it was assumed that US policies would be followed. The Canadian Institute recommendations for accounting standards usually reflected policy recommendations in the US.

Empirical Research on Reconciliations to US GAAP

Empirical research has also reflected the belief that US and Canadian GAAP are virtually identical. As the SEC-mandated reconciliations began to be studied, researchers purposely excluded Canadian companies in the sample (e.g., Amir et al. 1993; Fulkerson 1993; McQueen 1993). This exclusion was considered justified under the premise that the two GAAPs were so similar that differences were unlikely to have information value (Amir et al. 1993).

Based on the assumption that Canadian and US accounting practices were very similar, a tentative multijurisdictional agreement was reached in 1991 to permit accounting reciprocity for cross-listed Canadian and US companies. Unless the US reversed its position on the agreement, reciprocity would go into effect.

However, Drury (1979) reports that beginning in the late 1960's, Canadian and US accounting practices began to diverge. For example, Canadian GAAP frequently allows greater discretion in accounting reporting than is permitted for the more detailed

requirements in US GAAP. By the 1990s differences between the two forms of GAAP had expanded. Thus, contrary to much conventional thinking, many differences do exist between Canadian and US GAAP.

While deciding whether to allow the tentative multijurisdictional agreement to become official, the SEC performed its own study of the differences between foreign GAAPs and US GAAP. It looked at the number and size of accounting differences in companies that had filed reconciliations. The SEC found substantial accounting differences between Canadian and US GAAP (SEC 1993). The results of the study were used to reverse the multijurisdictional agreement (Luscombe 1994; SEC Docket 1993).

In a combined effort with the standard-setting bodies of Canada, the US, and Mexico, the FASB (1995) published a study of accounting differences among three countries. It identifies many differences between Canadian and US GAAP, many of which have substantial impact on accounting numbers. Multinational accounting firms have published guides to US and Canadian GAAP which also identify numerous differences (e.g., Coopers and Lybrand 1993).

Other studies have recently found numerous differences between Canadian and US GAAP. Bandyopadhyay et al. (1994) find that the mean absolute value difference in earnings between US and Canadian GAAP is 4.6% of the market value of common equity for their sample. Lee (1994) finds a 9.3% median absolute value difference in earnings for his sample, while Barth and Clinch (1996) find that the mean total difference in US and Canadian GAAP earnings is 8.4 % of Canadian GAAP earnings for their sample.

The results of numerous descriptive analyses conclude, contrary to past belief, that there are many differences between US and Canadian GAAP. However, the

existence of differences does not necessarily demonstrate that reconciliation is needed. To justify reconciliation, US GAAP reconciliations must produce additional signals that provide incremental information value.

Several empirical studies have investigated whether the reconciliation of Canadian financial statements to US GAAP produces signals that possess incremental information value for stock return variables.⁴ Bandyopadhyay et al. (1994) employ both a long and short return window format to investigate the incremental information value of the US GAAP earnings reconciliations. They sample 96 Canadian companies (299 company years) listed on US exchanges between 1983 and 1989. In their descriptive analysis, they find that reconciliation can have a significant effect on the calculation of earnings. For example, they find that the mean US GAAP earnings is lower than Canadian GAAP by 2.2 % of the market value of equity.

However, using a twelve month return window, they find no information value in either the reconciliation to US GAAP earnings or the reconciliation of the change in earnings. Similarly, when individual components of the earnings reconciliation are considered, no information value is found. These results remain even if the half of the sample with the smallest reconciliation differences is discarded. No balance sheet reconciled data were used in the tests.

In the short window tests, knowledge of the precise date reconciliations are publicly available is problematic. Therefore, Bandyopadhyay et al. (1994) use four potential dates when the reconciliation (either in the annual report or the SEC filing)

⁴ A number of studies have examined the information value of reconciling financial statements of companies from other countries besides Canada. These studies include McQueen (1993), Fulkerson (1993), Pope and Rees (1992), and Amir et al. (1993).

could have been made publicly available. They use squared market model prediction errors for the five days around earnings announcement dates and use US GAAP reconciliation dates for 42 Canadian companies (99 company years). They find significant information immediately around the earnings announcement date, but very little significance around the potential dates the US GAAP reconciliation could have been made available. These results suggest that the announcement of the US GAAP reconciliation does not add information value.

Rees (1995) uses a five-day short window approach with a somewhat different methodology to examine the information value of US GAAP reconciliations. As dependent variable he uses a CRSP equally weighted market return over the five-day return window. As independent variable he uses the change in reconciliation of earnings from one year to the next adjusted by the currency exchange rate. He also includes as independent variable the change in the strength of the foreign currency relative to the US dollar within the five day window. Using 558 company years (Canadian and non-Canadian companies) from 1987 to 1991, he finds significant information value in the change in reconciled earnings.

As a second means of analysis, reconciled earnings is added as an explanatory variable to the change in reconciled earnings. The change in reconciled earnings remains statistically significant, but the reconciliation of earnings does not. Contrary to previous studies, Rees also finds that the change in reconciliation variable is statistically more significant for Canadian companies than for the non-Canadian companies in the sample.

One possible explanation for this finding is that investors expect few differences between Canadian and US GAAP. Therefore, when large differences do occur, investor

reactions are strong. On the other hand, investors expect larger differences between accounting practices with reporting from other foreign countries. They employ analytical tools to cope with the differences or may discount the importance of the differences. The results of the Rees study are also highly dependent on the return window methodology used. When the five-day period is modified slightly, statistical significance is lost.

In a long return window study, Barth and Clinch (1996) examine the information content of the US GAAP reconciliation of earnings, equity, and certain components of earnings and equity. The sample consists of 98 United Kingdom (UK) companies, 22 Australian companies, and 229 Canadian companies for the years 1985-1991. They obtain earnings and equity information from the United Kingdom (UK) and Australian companies, but are only able to obtain earnings data from the Canadian companies.

Barth and Clinch first regress the stock return on earnings in original GAAP and the reconciliation to US GAAP earnings. They find significant information content in US GAAP reconciliations for UK and Australian companies, but not for Canadian companies. They next regress the stock return on domestic earnings, the change in domestic earnings, and the reconciliation to US GAAP of earnings and change in earnings. In this case, the reconciliation of earnings and the change in reconciled earnings are significant for Canadian companies. Barth and Clinch also analyze the information value of components of earnings. In several instances, the components of earnings provide information value for UK and Australian companies. However, only with the change in interest capitalization is information value found for Canadian companies. Barth and Clinch (1996, p. 164) conclude their study by stating:

Although we provide limited evidence that U.S. GAAP reflects the information that investors use in establishing share prices beyond that reflected in Canadian GAAP, the evidence is unstable, and thus inconclusive, a finding that is consistent with Bandyopadhyay et al. (1994).

In summary, the evidence suggests that, contrary to previous conventional wisdom, there are many accounting differences between US and Canadian GAAP. However, the results of Canadian studies are inconsistent as to whether reconciliations provide information value for stock valuation purposes.

This study extends previous reconciliation research and considers alternative uses of reconciled accounting information for Canadian companies (Bandyopadhyay et al. 1994). It also uses reconciled data from both the income statement and balance sheets. The next section introduces other explanatory variables which can be used to examine the information value of reconciliations.

CHAPTER 4

RATIOS AND DATA COLLECTION

To date, Canadian-based research has been limited to investigating the usefulness of earnings reconciliations for explaining stock returns. However, accounting information is used in other decision contexts besides stock valuation. Reconciliations also potentially alter other accounting numbers besides earnings. In this study, reconciliations are used to restate balance sheet and income statement numbers of Canadian financial statements to US GAAP. Ratios are then calculated from the financial statements. The study then investigates the information value of restated ratios in explaining two economic variables.

Ratio Approach to Evaluating Accounting Information

Ratios have long been used and accepted as a means to assist in decision making. They are employed in both international and domestic settings (Todd and Sherman 1991). They are also used in fundamental analysis and when estimating risk and predicting bankruptcy (Ou and Penman 1989; Beaver et al. 1970; Beaver 1966).

Ratio analysis is used for investment and non-investment decisions. For example, it is used extensively in the evaluation of management performance and debt covenants (Watts and Zimmerman 1986). Of course, ratio analysis is not the only important tool used in decision-making. Other types of quantitative analysis are also employed and qualitative considerations are often the most important in the decision-making process. Still, ratio analysis is an important tool used in decision making.

In this study, the differences between ratios in US and Canadian GAAP are used to explain two economic variables. For the differences in ratios to have meaning, it is important for the ratios to have similar uses and interpretations in the US and Canada. If ratios are not used for similar purposes in both countries, determining the effect of restatement on ratios in the two countries provides little value.

Evidence from various sources suggests that ratios have very similar purposes in Canada and the US. Surveys have indicated that US and Canadian companies publish similar ratios in their annual reports. Accounting and finance publications from both sides of the border use the same ratios. In addition, surveys of practitioners and empirical studies in both countries indicate the use of the same ratios in financial analysis (CICA Research Report 1993; Canadian Securities Institute 1989).⁵ The evidence suggests that there is a very similar interpretation of ratios in the two countries.

Publications often shy away from giving specific recommendations for the optimum values of particular ratios. Instead they give general guidelines and recommend analyzing trends and making comparisons within industries. However, the types of ratios used and their interpretation appear to be very similar in both countries (CICA Research Report 1993; Canadian Research Institute 1989).

It is useful to group accounting ratios into four categories: 1) liquidity, 2) efficiency, 3) profitability, and 4) leverage. Numerous ratios from each category have been used in financial analysis and empirical studies. Ratios for this study are selected

⁵ The Canadian Institute of Chartered Accountants (1993) published an extensive review of accounting ratios, including a review of the use of specific ratios in annual reports, textbooks, and empirical research. Some of the discussion herein, including the use of specific ratios, is based on the information available in that publication.

from these categories based on the following criteria: 1) the support for the ratio from previous empirical studies, 2) the use of the ratio by practitioners, and 3) the availability of data needed to restate the ratio in US GAAP.

Liquidity ratios are used to predict the ability of a company to pay its short term obligations. The current ratio is ranked as the most commonly accepted by Canadian and US practitioners. It is the most used ratio in empirical studies and financial analysis texts. The formula for this ratio is current assets divided by current liabilities. A recent survey found that 29% of public companies in Canada publish this ratio. A total for current assets and current liabilities is reported in the balance sheet of virtually all companies. Therefore, the numbers required to calculate this ratio should be easily obtainable. For these reasons, the current ratio is chosen to represent liquidity ratios.

Few adjustments made to restate financial statements from Canadian to US GAAP involve the use of current assets or current liabilities or any of the components of current assets or current liabilities. Therefore, it is anticipated that the reconciliation of financial statements to US GAAP will have little effect on the calculation of liquidity ratios. Most other liquidity ratios require knowledge of the components of current assets. Reconciliations do not always provide this level of detail. For these reasons, only one liquidity ratio is chosen to be restated for this study.

Efficiency ratios are used to help determine how well management uses its resources. These ratios are often divided according to their short-term or long-term nature. Two of the most frequently referenced short term efficiency ratios are inventory turnover and accounts receivable turnover. Like the calculation of liquidity ratios, the calculation of short term efficiency ratios usually involves knowledge of the components

of current assets, which often is not available in reconciliations. This study uses efficiency ratios that can be calculated from the disclosures provided in most reconciliations. It is expected that reconciliations will not change the value of most short-term efficiency ratios.

The two most frequently cited long-term efficiency ratios in texts are total asset turnover (sales divided by total assets) and fixed asset turnover (sales divided by total fixed assets). Total asset turnover is the most used long-term efficiency ratio in empirical studies (CICA Research 1993). Fixed assets are often the largest component of total assets. However, many GAAP differences that affect total assets do not affect the calculation of fixed assets. Almost all reconciliations provide enough detail to calculate both total asset turnover and fixed asset turnover.

Profitability ratios are used to evaluate how effectively management earns profits on the resources available to the company. The two most commonly used profitability ratios in empirical studies are return on assets (net income divided by total assets) and return on equity (net income minus preferred dividends divided by common stockholders' equity). They are also the first and third most heavily used in textbooks. In addition, they are frequently published in annual reports and used by financial analysts. Reconciliations provide the detail necessary to calculate both ratios. Because the calculation of both ratios involves the use of summary numbers, it is expected that these ratios will be more affected by accounting differences than other ratios.

Leverage ratios are used to help determine the ability of companies to pay their long-term obligations. These ratios are heavily used by both investors and creditors. Two of the most commonly used leverage ratios are debt to equity (total debt divided by

total equity) and interest coverage (net income plus interest expense divided by interest expense). They are two of the most commonly used leverage ratios in annual reports, empirical studies, and texts. The accounting numbers required to calculate the debt to equity ratio are easily available from most reconciliations.

Some reconciliations do not provide enough disclosure to calculate the interest coverage ratio. In addition, some small publicly traded Canadian companies have no long-term debt and therefore pay no interest. In those cases, the denominator in the formula is zero. Therefore a third leverage ratio used is long-term debt to assets (long-term debt excluding any deferred taxes divided by total assets). This ratio isolates the noncurrent form of debt that is important to long-term decision making. Its formula resembles several ratios that are prominent in texts and published in annual reports. This ratio is also used in two prominent empirical studies involving debt ratings. The detail provided by most US GAAP reconciliations makes the calculation of this ratio straightforward.

In summary, previous empirical research on the reconciliation of Canadian financial statements to US GAAP has been limited to an analysis of earnings. This study extends explanatory variables to include many types of ratios. The inclusion of ratios potentially provides a broader understanding of the information value of reconciliations. The ratios chosen are widely used in practice and research. They can also be calculated from the disclosures available in most reconciliations. Most of the ratios have calculation formulas that are identical or very similar to those used in other empirical studies.

Data Collection

Previous studies have tested the information value of the US GAAP earnings reconciliation for Canadian companies. However, the scope of these studies was limited because balance sheet reconciliations were not available. Also, many of the Canadian companies listed on US stock exchanges are very small. Reconciliations for these companies are not always available from conventional data sources. A goal of this study was to restate earnings and the balance sheet to US GAAP for a large sample of financial statements that are representative of all Canadian companies providing reconciliations.

Several sources were used to obtain a list of Canadian companies likely to prepare US GAAP reconciliations. The companies from the SEC (1993) and FASB (1995) studies were used to obtain an preliminary list of Canadian companies filing reconciliations with the SEC. This list was somewhat out of date due to the fact that each year new companies list on US exchanges. Also, some companies may have merged, changed names, become privately owned, ceased to exist, or may no longer be subject to SEC regulation. Also, the SEC study does not identify which of its worldwide sample of companies are Canadian companies. To obtain a more complete sample, a 1995 listing of Canadian companies listed on US exchanges was acquired directly from the New York Stock Exchange (NYSE), the American Stock Exchange (AMEX), and National Association of Securities Dealers Automated Quotation system (NASDAQ). Additional names of companies were obtained from Moody's International Manual (1994), Global Information Services (1994), Disclosure, Inc. CD-ROM, and the Rees (1995) study. This search resulted in a list of 511 possible names of companies.

Of the 511 company names, some were similar and probably represent duplicates. Some companies have merged, changed names, or gone out of business. Addresses were found for 393 companies. Each of these companies was sent a written request asking for a copy of the annual report and SEC filing. Of the total number of letters, approximately two dozen were returned by the post office because of incorrect addresses. Presumably, the companies are either no longer in business or have moved.

Other sources of annual reports and reconciliation data were also considered. For example, two reports were obtained from Moody's International Manual 1994. However, none of the sources were expected to have a large sample of reconciliations, particularly for smaller companies. For example, the available source of Disclosure Inc. CD-ROM carries reconciliations for only NYSE, AMEX, or Fortune 1000 companies. The available annual report may not be as recent as can be obtained directly from companies.

The annual reports received represent a wide spectrum of Canadian companies. Some are multibillion dollar Fortune 1000 companies. Some are very small public companies with assets less than \$10 million. Some companies have long been listed on the NYSE while others are relatively new companies traded on the electronic bulletin board.

For several reasons, not all the annual reports could be used for this study. Only annual reports with fiscal years ending between December 1994 and December 1995 are included in the sample. Because accounting standards often change, old financial statements do not represent current differences between the two GAAPs. Two hundred and twenty-four annual reports remained after excluding out-of-date financial statements.

Many companies reported no material differences between Canadian and US GAAP. Other companies are exempt from the reconciliation requirement. The purpose of the study is to determine if reconciliations that are published add information value; therefore, financial statements without reconciliations are excluded from the sample.

Other companies were excluded because they did not prepare sufficient disclosures to restate both the income statement and balance sheet to US GAAP. For example, some companies provided only textual explanations, without providing the amounts needed to make the necessary calculations. Other companies reconciled only the income statement. Others presented some balance sheet disclosures, but not to a sufficient extent to perform the necessary calculations. It is this very lack of balance sheet disclosure which has handicapped previous studies involving reconciliations of Canadian financial statements.

Some companies did present reconciled financial statements, usually in an abbreviated form using a few main categories. Many others did not furnish reconciled statements, but provided enough disclosures that a manual reconciliation was possible. In three cases, the companies actually used US GAAP for their primary reporting, then reconciled to Canadian GAAP. Restatements of major sections of the balance sheet and income statement were completed for a sample of 137 Canadian companies. The restatement calculations were also reviewed by an independent party.

CHAPTER 5

DESCRIPTIVE ANALYSIS AND HYPOTHESES

Descriptive Analysis of Restatements -- Effect on Ratios

Before testing whether the restatements provide incremental information value for economic variables, descriptive evidence of the effect of restatement on ratios is gathered.

For restated ratios to potentially possess information value, the ratios must have different values in US and Canadian GAAP. To make this determination, two questions are addressed. Because of their descriptive nature, the questions are not phrased as hypotheses. The first question is:

Q1: Does the restatement from Canadian to US GAAP change the value of ratios?

In previous studies, ratios have been shown to be non-normally distributed (Barnes 1987). If the distribution is skewed, the results the parametric paired 't' test may be misleading. If there are outliers, nonparametric procedures may be more powerful and appropriate (Ott 1988). Therefore, the Wilcoxon signed rank test of the absolute value of the difference in ratios is used to test this question. With an absolute value test, any difference in value (increase or decrease) is considered a change in the value of a ratio. Liquidity, leverage, efficiency and profitability ratios are tested. Past reconciliation studies have found substantial differences between earnings in US and Canadian GAAP. Almost all reconciliations affect some calculations on the income statement or balance sheet. Most differences in GAAP affect noncurrent debt, equity, and income recognition. Therefore, it is expected that there will be significant absolute value differences in ratios involving noncurrent debt, equity, and income.

However, it is not inevitable that there would be significant differences, particularly with liquidity ratios. Few differences between US and Canadian GAAP pertain to current balance sheet items. However, it is expected that there would be significant differences in the absolute values of profitability, leverage, and to a lesser extent efficiency ratios.

Results finding significant absolute value differences for Q1 would provide statistical evidence that US GAAP restatements change the values of ratios of Canadian companies. However, Q1 does not consider whether restatements bias the value of ratios in a particular direction. According to the conventional belief that Canadian and US accounting practices are virtually equal, ratios should be approximately the same in both GAAPs. Finding that the restatement to US GAAP changes the value of ratios in a systematic way, however, would call this assumption into question. The second question addresses this possibility:

Q2: Does the restatement from Canadian GAAP to US GAAP change the ratio value of Canadian companies in a systematic way?

Since actual (not absolute value) differences are tested, positive and negative differences can occur. A two-tailed Wilcoxon signed rank test is used on the differences between the ratio values in US and Canadian GAAP. The results reveal whether a given ratio in US GAAP is systematically higher (or lower) than in Canadian GAAP.

Most studies indicate that for a majority of Canadian companies, net income is higher under Canadian GAAP. If so, US GAAP restatements may result in systematically lower profitability ratios than under Canadian GAAP. It is also possible that a given ratio increases for some Canadian companies and decreases for others. There

is some evidence to suggest this is the case. The SEC (1993) study finds that the income of 52 Canadian companies increased when reconciled to US GAAP while the income of 94 others decreased. Equity increased for 24 companies and decreased for 95. Barth and Clinch (1996) find income higher in US GAAP for 115 companies and in Canadian GAAP for 113 companies. If there is no clear pattern in the direction of GAAP differences, no systematic differences may be found in Q2. However, absolute value differences would still be found in Q1.

Using the collected reconciled data, Q1 and Q2 are tested for differences in ratios values under US and Canadian GAAP. These tests are a replication and extension of previous studies. Other studies find significant differences in earnings. It is expected that significant differences exist between Canadian and US GAAP in the values of some ratios. The two questions are descriptive in nature, and do not address whether the accounting differences produce signals that have information value for decision-making purposes. To address this issue, the accounting differences need to be examined in connection with decision variables. The next section introduces two hypotheses that consider whether the ratio differences resulting from restatement produce additional signals containing information value.

Development of the Hypotheses

A major purpose of financial reporting is to provide information to external providers of debt and equity financing. If restatements possess information value, they should provide assistance in making debt and equity financing decisions. To date, most reconciliation research has investigated the information value of reconciliations in stock

return valuation. The results thus far have been inconclusive. This study examines two different economic variables, one debt and one equity. This section describes the two variables and the hypotheses which will be used to test for information value in restatements.

Debt Ratings

Debt represents a form of financing with fixed repayment terms. The price paid for debt is based on its perceived risk. Debt rating companies have been created to establish an independent opinion of the riskiness of debt.

Debt rating companies have an interest in using all relevant available information when establishing ratings. Ratios have long been used as an important part of the debt rating process (Belkaoui 1983; Standard and Poor's 1984). Raters also have access to greater information than is available publicly. For example, it is typical for raters to obtain additional private information directly from companies to aid in the rating decision. Similarly, if restatements of financial reporting to US GAAP have information value, they would also be used in the rating process. For international companies, Standard and Poor's (1984) seeks an explanation and quantification of differences in financial reporting from US GAAP. If these GAAP differences have information value, it is expected that there would be an association between the numbers in the restatements and in the debt rating.

Ratio analysis is an important part of the debt rating process (Standard and Poor's 1984). Leverage ratios can be used to assess the long-term ability of companies to meet their obligations. This information is important to bond holders to whom obligations are

paid. Profitability ratios indicate the ability of the company to earn income with its resources. This information is important to debt holders who provide some of the resources. The efficient use of resources in generating revenues is important to all stakeholders. Thus, efficiency ratios are also valuable to debt holders. Liquidity refers to the ability to repay short-term obligations. Interest on bonds represents one form of a short-term obligation. Liquidity ratios have been used successfully in previous bond rating studies.

Ratios have been used for several decades in empirical analysis to correctly identify bond ratings. Horrigan (1966) uses four types of accounting ratios (leverage, liquidity, profitability and efficiency) along with size and bond subordination status variables in a multiple regression format to identify bond ratings. Bond ratings are assigned an interval scale numerical value. Horrigan's model explains 65% of the variation in Moody's ratings and 63% of the variation in Standard and Poor's rating. He then uses this model to accurately predict 58% of Moody's ratings and 52% of Standard and Poor's ratings for a new sample of companies.

Pinches and Mingo (1973) use factor analysis to aggregate 35 financial ratios into seven dimensions. Ultimately, six variables are chosen for a multiple discriminant prediction model, (three of which are accounting ratios consisting of two leverage and one profitability) to develop a multiple discriminant prediction model. This model is used to correctly identify 65% of the ratings from a holdout sample.

Some controversy exists as to which statistical technique is most appropriate for tests of debt ratings. Debt ratings are an ordinal scale variable. An 'A' rating is superior to a 'B++' rating, but not necessarily by the same margin that a 'B++' rating is superior

to a 'B+'. When ordinary least squares is used, an interval-based scale is used to assign debt ratings. Conversely, discriminant analysis produces only a nominal-scale grouping of debt ratings. Thus it does not take advantage of the ordinal information which exists for debt ratings.

Because of the methodological concerns with ordinary least squares, Kaplan and Urwitz (1979) initially use multivariate probit analysis to predict bond ratings. Five ratios (four leverage and one profitability) are included with other variables in the predictive model. Their sample consists of 120 seasoned bond ratings from 1971-1972 and 207 new issue bond ratings from the 1970-1974 time period. They find that the financial leverage (long-term debt to total assets) ratio is highly significant for existing and newly rated companies. Two other ratios (long-term debt to net worth and net income to total assets) have less significance. Even though they would seem important to creditors, no significance is found for the interest and debt coverage ratios.

Kaplan and Urwitz also perform tests to compare the predictive ability of multivariate probit analysis and ordinary least squares. Using Horrigan's six variable model (four accounting ratios, size, and subordination status), they predict the ratings of new issues. They find that least squares outperforms probit analysis (55% to 50% prediction accuracy). As a result of the findings, Kaplan and Urwitz conclude that assigning interval scale values to bond ratings does not hamper the effectiveness of least squares as a statistical tool.

Belkaoui (1983) chooses multiple discriminant analysis to predict bond ratings. His model consists of five ratios (three liquidity and two leverage) and four other variables. He samples 381 industrial bonds rated B or higher by Standard and Poor's in

1981 and 388 bonds in 1980. A multiple discriminant model developed with 266 of the 1981 bond ratings is validated against the remaining 1981 bonds and all of the 1980 bonds. He finds it predicts the ratings of 1980 and 1981 bonds with 63.7% and 67.2% accuracy.

Evidence from empirical studies indicates that accounting ratios can be used to successfully identify bond ratings. This study extends the use of ratios as employed in other studies. It tests whether ratios restated to US GAAP add to the information already available from ratios in Canadian GAAP. If restatements to US GAAP are found to possess incremental information value, then this is evidence that US GAAP restatements are valuable for debt rating purposes. The first hypothesis (presented in null form) considers the usefulness of the restatements in identifying debt ratings:

H1: Ratios calculated in US GAAP restatements provide no incremental information in identifying debt ratings of Canadian companies.

Least squares regression has been used successfully in other studies to correctly identify a high proportion of ratings. It was used successfully in the Horrigan as well as the Kaplan and Urwitz study and has outperformed multivariate probit analysis. An interval scale is assigned for each debt rating (Horrigan 1966).

Most of the debt ratings for this test are obtained from Canadian Bond Rating Services (CBRS). The CBRS rates bonds and other long-term debt of many Canadian companies, including 33 of the companies in this study. Moody's and Standard and Poor's also rate some Canadian companies, including five not rated by CBRS. Therefore, the initial sample of companies for this test is 38.

The three debt rating companies follow a similar rating format. Table 1 presents the ratings used by the three rating companies. CBRS uses the A++, A+, A format; Moody's uses Aaa, Aa, and A; and Standard and Poor's uses AAA, AA, and A. Although there is some variation in wording, the description of credit risk has much consistency across the three rating companies. Only the top six categories for each rating company are included in the table because no Canadian companies in the sample have lower than the lowest B rating.

TABLE 1
COMPARISON OF DEBT RATING COMPANIES

<i>n</i>	Canadian Bond Rating Service (CBRS)		Moody's		Standard & Poor's	
0	A++	Highest Quality	Aaa	Best Quality	AAA	Extremely Strong
4	A+	Very Good Quality	Aa	High Quality	AA	Very Strong
13	A	Good Quality	A	Upper-medium-grade	A	Strong
8	B++	Medium Quality	Baa	Medium-Grade	BBB	Adequate capacity to pay debt
5	B+	Lower Quality	Ba	Speculative Elements	BB	A low degree of speculation
2	B	Poor Quality	B	Lack qualities of desirable investment	B	Somewhat higher degree of speculation

n = number of 32 companies of the sample in each rating category

In a number of cases, a company in the sample received ratings from two or more of the rating companies. There is a high degree of consistency in these ratings. Rating companies usually assign the same or adjacent rating. Because most of the ratings in the sample are available from the CBRS only, in the few instances when there is a difference in ratings, the CBRS rating is chosen.

Initially there are 38 companies for which debt ratings are available. From that total, two are excluded because they have both negative income and negative common stockholders' equity. This renders the calculation of return on equity meaningless. Another negative equity company is a wholly-owned subsidiary of a US parent company. The bond rating of this company would be more related to the financial condition of the parent company than the financial condition of the subsidiary. Two bank companies are deleted from the sample because financial institutions typically have ratio calculations much different from those of other companies. One additional company is deleted because there is not enough information available in the US GAAP reconciliation to calculate all ratios in the regression model. Thirty-two companies remain in the sample for testing the debt rating hypothesis.

There is considerable variability in the debt ratings of these 32 companies, with ratings ranging from A+ to B. There are four companies with A+ ratings, thirteen with A ratings, eight with B++ ratings, five with B+ ratings, and two with B ratings. Interval scale integers are assigned to the ratings as follows: A+ = 5, A = 4, B++ = 3, B+ = 2, B = 1. Often a company has more than one form of long-term debt. In some cases, each form of debt has the same rating. In other cases, however, a company may have more than one rating for its multiple forms of debt. Even in these cases, the ratings are usually

similar. When there is more than one rating, one rating is assigned to the company by random selection.

Ratios have been selected for calculation that have been used previously to predict bond ratings. For example, profitability ratios (e.g., return on assets) and leverage ratios (debt-to-equity) have proven significant in past empirical studies and in surveys of credit raters. Other ratios reconciled in this study are the same or very similar to the ratios used in debt rating studies.

Non-accounting variables have also been shown to be important in predicting bond ratings. In particular, bond subordination status and size variables (e.g., asset size) have been important in several previous studies.⁶ Therefore, these variables will also be included in the analysis. The form of the regression model will be as follows:

$$D_{it} = \alpha_0 + \alpha_1 R_{it} + \alpha_2 S_{it} + e_{it}$$

where D_{it} represents the debt rating (or long-term debt rating) of Canadian Company I at time t , R_{it} is a vector of eight ratios used for Company I at time t , S_{it} is a vector of non-ratio variables representing subordination status (dummy variable) and size for Company I at time t , and e_{it} is the error term.

A reasonable approach is to assume financial information users would first gather information about Canadian companies directly from Canadian financial statements, then glean additional useful information from US GAAP. The first step is to determine which set of variables from the above regression model in Canadian GAAP best explains the variability of debt ratings. The ADJRSQ option in SAS is first used to determine which

⁶ Subordination status of bonds is the most important variable in the Horrigan (1966), Pinches and Mingo (1973) and Belkaoui (1983) studies, and is highly significant in the Kaplan and Urwitz (1979) study.

subset of the independent variables from the above model results in the highest adjusted R^2 in Canadian GAAP. This might be considered the “best” Canadian model. Adjusted R^2 rather than R^2 is used to eliminate the effect of variables that add only incidentally to the model and to ensure some degree of parsimony.

Second, the regression for the best Canadian model is run using the variables in Canadian GAAP. Third, the regression is rerun after adding to the best Canadian GAAP model the same variables in US GAAP, thus creating the “full” model. Thus, the full model contains twice the number of ratio variables as the Canadian model. A multiple-partial F test is used to determine if the addition of variables in US GAAP adds significant information value to the information already available in the original model in Canadian GAAP (Kleinbaum et al. 1988). The multiple-partial F test is calculated by comparing the sum of squares of the full and original models. The formula for the multiple-partial F test is as follows:

$$\frac{[SS(Full) - SS(Orig)]/k}{MSE(Full)}$$

where $SS(Full)$ is the sum of squares regression for the full model of variables in Canadian GAAP and US GAAP, $SS(Orig)$ is the sum of squares regression for the model of ratios in original (Canadian) GAAP, k is the number of variables added to the original model to make the full model, and $MSE(Full)$ is the mean square error for the full model.

The multiple-partial F test has an F distribution with $k, n-p-k-1$ degrees of freedom, where n equals the sample size, and p is the number of variables in the original model. When the initial model consists of Canadian GAAP variables, the multiple-partial F test measures whether the explanatory power of variables of both Canadian and US GAAP (sum of squares of the full model) add to the explanatory power of the Canadian

variables (sum of squares of the Canadian model). Thus, the multiple partial F test is a test of *incremental* information value. It is not required that US GAAP possess greater information relative to Canadian GAAP, only that the restatement to US GAAP adds significantly to the information already provided by Canadian GAAP. By dividing by k , the formula adjusts for the number of variables added to the model similar to the effect of using adjusted R^2 rather than R^2 . Finding a significant F test statistic constitutes rejection of the null hypothesis and indicates that there is evidence that the restatement to US GAAP provides incremental information value for debt rating purposes.

The above approach employs the same independent variables in US GAAP as those employed in Canadian GAAP. However, it is possible that the set of variables having the greatest explanatory power in US GAAP is different from the set of variables with the most explanatory power in Canadian GAAP. A second approach, therefore, is used to test the hypothesis. The ADJRSQ option is again used to find the “best” US GAAP model. The same regression procedures are followed except that the full model consists of the Canadian GAAP variables from the best Canadian model and the US GAAP variables from the best US model.

In a third approach to test the hypothesis, no attempt is made to maintain parsimony by basing models on adjusted R^2 . Instead, all ten possible variables are included in the original Canadian model and all US GAAP variables are added to create the full model.⁷ The same procedures and multiple-partial F test are applied to test the hypothesis.

⁷ Because subordination status is the same in both Canadian and US GAAP, the full model consists of 19 variables: nine variables in Canadian GAAP and subordination status in the original model and nine variables in US GAAP for the full model.

Because the full model consists of variables in US and Canadian GAAP, it is expected that substantial multicollinearity will exist among variables. Since the purpose of the multiple-partial F test is to measure the explanatory power of models, rather than to measure the significance of the variable coefficients, collinearity is not an issue.

The full model consists of variables calculated in Canadian GAAP and US GAAP. An approach used in other studies is to use one set of variables in Canadian GAAP and to use a second set of variables consisting of the *difference* between US and Canadian GAAP. For purposes of the multiple-partial F test, however, the two approaches are mathematically identical and bring the same results.

Market-to-Book Value

The second form of business financing is equity. One stock-based ratio used in empirical analysis is the market-to-book ratio (MV/BV). The book value (BV) portion of this ratio as measured in the financial statements is based on accumulated and undistributed historical earnings and contributed capital. It represents the value of the company as determined by accounting measurement procedures. The market value (MV) is the current value of the company as determined by the price set in the marketplace. The formula for MV/BV is market price per share of common stock divided by accounting book value of common equity per share. Thus, the calculation of the MV/BV ratio represents a comparison of two measurements of the value of the company. This difference between MV and BV represents the amount of unrecorded goodwill attained by a company (Amir et al. 1993; Edwards and Bell 1961). Unrecorded goodwill reflects the

market's perception of earnings that have not yet been recorded by accounting procedures. The MV/BV ratio represents a measurement of that goodwill.

Differences in MV/BV ratios occur when different accounting methods are used to measure equity. For example, conservative accounting procedures result in lower BVs and consequently higher values in the MV/BV ratio. If US GAAP possesses information value incremental to the information in Canadian GAAP, then restatements to US GAAP should help explain MV/BV as measured in Canadian GAAP (Amir et al. 1993).

There is empirical evidence that the inverse of MV/BV (i.e., BV/MV) proxies for risk. Fama and French (1992) sample companies listed on national stock exchanges over the period 1963-1990. They find that BV/MV correlates strongly with average stock return. This relationship holds for companies of all asset sizes. The association with average return is stronger than either asset size or $Beta$, two of the more commonly used proxies for risk.

The relationship between MV/BV and accounting numbers restated to US GAAP has been investigated for non-Canadian companies by Amir et al. (1993). They calculate MV/BV using the market price six months after fiscal year end to allow all information contained in the financial statements to be reflected in the stock price. This study examines the effect of ratios restated to US GAAP on the MV/BV for Canadian companies. If ratios restated to US GAAP have incremental information value, they should help explain the MV/BV in Canadian GAAP. This possibility is tested with the following null hypothesis:

H2: Ratios calculated in US GAAP provide no incremental information to the MV/BV ratio of Canadian companies.

The following regression model will be used:

$$MV/BV_{it} = \alpha_0 + \alpha_1 R_{it} + e_{it}$$

where MV/BV_{it} is the market value to book value ratios for the i th Canadian company at time t plus six months and R_{it} is a vector of ratios for the i th company at time t .

Year-end book values were obtained directly from the annual report of the company. Market values six months following year end were obtained from the Daily Stock Record of the NYSE, AMEX, and NASDAQ, and from the *Wall Street Journal*. MV/BV dates range between June 30, 1995 and June 30, 1996. Stock prices were not available for some companies. For example, prices for companies traded on the electronic bulletin board were not available from these sources. The prices of some companies traded only in Canada were not available. In addition, companies with negative book values were excluded from the sample. Companies with book values approaching zero have a potential for artificially high MV/BVs . Therefore, two companies with book values of \$0.10 or less per share were excluded. The final sample consisted of 87 companies for which the MV/BV and independent variables were available. The same statistical procedures are followed as those used in the debt rating tests. Again, the multiple-partial F test is used to test for incremental information value of US GAAP ratios.

Summary of Hypotheses

Two hypotheses are used to investigate the information value of US GAAP restatements of Canadian financial statements with debt and equity variables. The rejection of either the debt or the equity hypothesis indicates that the restatements provide

incremental information value. Such findings support of the existing reconciliation requirement. However, the failure to reject both hypotheses indicates that there is insufficient evidence that changes brought about by restatement have information value for Canadian companies. Such findings support a reciprocity policy between the US and Canada.

CHAPTER 6

RESULTS

Descriptive Analysis

Table 2 provides a descriptive analysis of ratios and net income. One hundred and thirty-seven Canadian companies are included in the sample. However, a few of the restatements do not provide enough information to calculate all ratios. Therefore, for some of the ratios, the sample size is less than 137. Mean and median values are given for the ratios in Canadian and US GAAP in Columns 3 and 4. Next mean and median values for the difference in the ratios between US and Canadian GAAP (DIFF) are given in Column 5. The extreme high and low observation for the difference between US and Canadian GAAP is given in Column 6. The conclusion gained from Columns 3-6 is that there is a strong outlier effect on ratios and on the difference in ratios between US and Canadian GAAP. For most ratios there is a large difference between mean and median. Some of the most vivid examples of the outlier effect are the debt-to-equity ratio and return on equity. For one observation, the difference in debt-to-equity between US and Canadian GAAP is -875.82. The difference in return on equity for one observation is -14.428.

Columns 7-9 indicate the number of companies for which the value of the ratio is greater in US GAAP, equal in the two GAAPs, and greater in Canadian GAAP. Previous studies have shown that for a majority of companies, net income is higher in Canadian GAAP. For this sample, the same result holds, but only barely. Fifty-six companies have higher net income in US GAAP and 58 have higher net income in Canadian GAAP.

TABLE 2

DESCRIPTIVE ANALYSIS

1	2	3	4	5	6	7	8	9	10	11	12
	n ^a	CAN GAAP Mean Median	US GAAP Mean Median	DIFF US-CAN Mean Median	DIFF US-CAN High Low	# US GAAP > CAN GAAP	# US GAAP = CAN GAAP	# US GAAP < CAN GAAP	Kolmogorov Test for Normality p-value	Non-Parametric	
										Q1: DIFF ≠ 0 p-value	Q2: DIFF ≠ 0 p-value
Net Income	136	49,655,406 1,245,140	48,350,793 824,098	0.174 ^b 0	24.867 -21.083	56	22	58	<.0001	<.0001	.90
Current Ratio	135	6.35 1.84	6.46 1.84	0.049 0	6.455 -1.026	17	99	19	<.0001	<.0001	.57
Debt to Equity	137	7.27 0.74	1.61 0.80	-5.67 0.007	33.887 -875.820	81	22	34	<.0001	<.0001	<.0001
L/T Debt to Assets	135	0.20 0.146	0.205 0.16	0.0047 0	0.289 -0.253	58	40	37	<.0001	<.0001	.15
Total Asset Turnover	132	0.686 0.489	0.685 0.471	-0.0041 0	0.192 -0.225	50	38	44	<.0001	<.0001	.72
Fixed Asset Turnover	130	4.00 1.10	3.85 1.07	-0.011 0	0.246 -0.664	24	81	25	<.0001	<.0001	.76
Return on Assets	137	-0.057 0.0081	-0.042 0.013	0.015 -0.001	2.025 -0.594	46	10	81	<.0001	<.0001	.01
Return on Equity	134	-0.056 0.031	-0.010 0.037	0.051 -0.002	10.137 -14.428	48	11	75	<.0001	<.0001	.04
Interest Coverage	114	-9.13 1.474	-14.622 1.527	-5.39 0	136.56 -347.15	39	19	56	<.0001	<.0001	.05

DIFF = Variable in US GAAP – Variable in CAN GAAP
Current Ratio = Current Assets (end of year) – Current Liabilities (end of year)
Debt-to-Equity = Total Liabilities (end of year) / Total Stockholders' Equity (end of year)
L/T Debt to Assets = [Total Liabilities – Current Liabilities – Deferred Taxes (end of year)] / Total Assets (end of year)
Total Asset Turnover = Sales / Total Assets (end of year)
Fixed Asset Turnover = Sales / Fixed Assets (end of year)
Return on Assets = Net Income / Total Assets (end of year)
Return on Equity = (Net Income - Preferred Stock Dividend) / Common Stockholders' Equity
Interest Coverage = (Net Income + Interest Expense) / (Interest Expense)

^a Represents the sample size of differences between US and Canadian GAAP.

^b Represents the sample size for the DIFF variable.

Based on the conventional understanding that US GAAP is more conservative than Canadian GAAP, it would be anticipated that profitability ratios are lower and leverage ratios are higher in US GAAP. The results conform to expectations. Debt-to-equity is higher in US GAAP for 81 companies, lower for 34. Long-term debt to assets is higher in US GAAP for 58 companies, lower for 37. Return on equity (return on assets) is higher in US GAAP for 48 (46) companies, lower for 75 (81). However, for none of the ratios are the results completely one-sided.

Column 10 contains the results of the Kolmogorov test for normality of the difference in ratios between US and Canadian GAAP. Given the strong impact of outliers, it is not surprising that normality is rejected. Observed significance levels are consistently less than .0001 for all ratios.

Because of the non-normality that exists, tests of paired differences calculated with nonparametric analysis have more power than parametric tests. The results of the Wilcoxon signed rank test for absolute value differences in the ratios are produced in Column 11. This test addresses Q1, which considers whether the restatement from Canadian to US GAAP changes the value of ratios. The significance levels for the tests are consistently less than .0001 which provides evidence that the values of the ratios change. The absolute value of differences is considered in this test. Since any difference (increase or decrease) is considered a change, this is the easier of the two questions to show a restatement effect.

Column 12 displays the results of testing Q2, which considers whether reconciliation systematically changes the value of the ratios. The results of the Wilcoxon signed rank test of actual value differences are less consistent than for Q1. Some ratios

(most notably the profitability ratios and debt-to-equity) show evidence that US GAAP restatements bias the value of ratios in a particular direction. However, there is little evidence that restatement biases the values of efficiency ratios or the current ratio. At significance levels ranging from .0001 to .05, debt-to-equity, return on assets, and return on equity ratios are systematically changed when restated to US GAAP.⁸

The conclusion of this descriptive analysis is that US GAAP restatements change the values of ratios and net income. For some of these variables more than half of the companies are affected. The results of these tests, however, do not indicate whether any of the changes have information value. The results from the debt rating and market-to-book value tests will be used to determine the information value of the restatements.

Debt Rating Results

Initially eight accounting ratio variables and two non-accounting ratio variables are included as potential variables in the full model. The eight accounting ratios are: current ratio, debt-to-equity, long-term debt to total assets, interest coverage, total asset turnover, fixed asset turnover, return on assets, and return on equity. The two non-ratio variables are total assets and subordination status.

Correlations between the variables and debt rating are given in Table 3. The ratios that are expected to be the most closely associated with debt ratings (profitability and leverage) have the expected direction of correlation. However, the liquidity ratio and efficiency ratios have the opposite sign from the one expected. A possible

⁸ The results from parametric tests are not nearly as impressive. For debt-to-equity, return on assets, and return on equity differences in the testing of Q2 are not significant. In some cases the results of Q1 are also not significant.

TABLE 3
SPEARMAN AND PEARSON CORRELATION COEFFICIENTS
BETWEEN DEBT RATING AND VARIABLES

	Spearman		Pearson	
	CAN GAAP	US GAAP	CAN GAAP	US GAAP
Subordination Status*	-.30	-.30	-.31	-.31
Current Ratio	-.28	-.30	-.27	-.28
Debt-to-Equity	-.26	-.26	-.32	-.26
Long-term Debt to Assets	-.28	-.42	-.29	-.44
Fixed Asset Turnover	-.29	-.31	-.25	-.24
Total Asset Turnover	-.28	-.32	-.33	-.36
Return on Assets	.30	.26	.29	.22
Return on Equity	.20	.10	.23	-.12
Interest Coverage	.39	.33	.12	.12
Total Assets	.45	.45	.48	.48

* Subordination status is not an accounting variable. Therefore, the correlation is unrelated to the form of GAAP.

Sample size = 32

explanation for the current ratio is that debt ratings are primarily concerned with long-term solvency. Therefore, current debt obligations may not be as important in the rating process. Another explanation is that there are other factors (e.g., industry effect) at work. Ratios are known to vary by industry. A review of the debt rated companies and their current ratios reveals that many of the highly rated companies with low current ratios are oil and gas companies. Troy (1995) summarizes the average value of many ratios by industry. Petroleum companies average a somewhat lower current ratio (1.1) than some

other industries represented in this sample.⁹ However, several oil and gas companies have current ratios below the Troy averages and yet maintain high debt ratings. The type of industry may also have an effect on efficiency ratios. Troy (1995) reports average total asset turnover for oil and gas companies to be 0.3 while in other industries it can be higher.¹⁰

The results of the test of H1 are reported in Table 4, Panel A. First, the ADJRSQ option in SAS was used to determine which subset of the ten variables in Canadian GAAP has the highest adjusted R^2 in explaining the variability in debt ratings. The four variable model of debt-to-equity, interest coverage, total assets, and subordination status had the highest adjusted R^2 value of .393. The original Canadian GAAP model has significance at the .0013 level. Next, accounting variables in US GAAP are added to the Canadian GAAP and subordination status variables already in the model, to comprise the full model of seven independent variables. This model results in a decreased adjusted R^2 to .343. The test statistic of only .310 indicates that there is no evidence of incremental information.

The second approach is to add the variables of the “best” US GAAP model to the variables in the “best” Canadian GAAP model. The best US GAAP model consists of three variables: long term debt to assets, total assets, and subordination status. The combination of this model with the best Canadian model results in an adjusted R^2 of .389. This model only provides evidence of information content at the .417 significance level.

⁹ For example, Troy (1995) indicates an average ratio of metal mining companies of 1.2 and alcohol companies of 1.5. Pulp and paper companies average lower at .9.

¹⁰ Troy (1995) reports an average ratio of .7 for pulp and paper, .4 for alcohol, and .3 for mining companies.

TABLE 4

**RESULTS OF TESTING FOR INCREMENTAL VALUE OF US GAAP
RESTATEMENTS WITH DEBT RATINGS**

32 Firms

BEST CANADIAN MODEL			
Panel A	Canadian GAAP	US GAAP Added to Canadian GAAP	US GAAP in Best US Model Added to Canadian GAAP
R^2	.472	.491	.507
R_a^2	.393	.343	.389
F	6.026	.310	.907
df	4, 27	3, 24	2, 25
p -val	.0013	.818	.417

ALL VARIABLE MODEL		
Panel B	Canadian GAAP	US GAAP Added to Canadian GAAP
R^2	.533	.774
R_a^2	.311	.417
F	2.398	1.424
df	10, 21	9, 12
p -val	.044	.279

Best Canadian Model consists of variables that produce the highest adjusted R^2 in Canadian GAAP. Consists of debt-to-equity, total assets, subordination status, interest coverage.

Best US Model consists of the variables that produce the highest adjusted R^2 in US GAAP. Consists of long-term debt to assets, total assets, subordination status.

All Variable Model consists of all 10 variables: current ratio, debt-to-equity, long-term debt to assets, interest coverage, return on assets, return on equity, total asset turnover, fixed asset turnover, total assets, subordination status.

Test Statistic = F statistic = $\frac{(\text{Sum of Squares [Full Model]} - \text{Sum of Squares [Original]})/k}{\text{MSE (Full)}}$

df = $k, n-p-k-1$

SS (Full) = Sum of squares (Full Model) of variables in both US and CAN GAAP

SS (Original) = Sum of squares (Original Model) of variables in original GAAP Model

k = Number of variables added in the full model, not included in original model

p = Number of variables in the original model

MSE (Full) = Mean squared error (Full Model)

R_a^2 = adjusted R^2

n = 32

The third approach of including all ten variables in the model is reported in Table 4, Panel B. This approach results in an R^2 and adjusted R^2 in Canadian GAAP of .533 and .311. When the US GAAP variables are added, R^2 and adjusted R^2 increase to .774 and .417. The addition of the US GAAP variables produces evidence of incremental information only at the .279 significance level. In the third approach, R^2 and adjusted R^2 increase substantially. However, the results are not strong enough to claim that US GAAP provides incremental information for debt rating purposes.

White's test and the Shapiro-Wilk test were used to check for heteroskedasticity and non-normality of the error term. No evidence of heteroskedasticity or non-normality was found in the debt rating tests.

In summary, several approaches have been used to test whether US GAAP restatements add information value to Canadian GAAP in identifying the debt rating of Canadian companies. The evidence is not sufficient at traditional significance levels to claim that information is being added for debt rating purposes.

Market-to-Book Results

Correlations between MV/BV and the eight accounting ratios and size are reported in Table 5. Fama and French (1992) indicate that MV/BV may be an inverse proxy for risk. Thus, companies with high MV/BV values would normally be considered low in risk. Beaver et al. (1970) find that liquidity and leverage ratios are correlated with market risk. The correlations of MV/BV with liquidity and leverage ratios (short-term risk and long-term risk variables) are consistent with Beaver et al. findings. The current ratio is

TABLE 5
SPEARMAN AND PEARSON CORRELATION COEFFICIENTS
BETWEEN *MV/BV* AND ACCOUNTING VARIABLES

	Spearman		Pearson	
	CAN GAAP	US GAAP	CAN GAAP	US GAAP
Current Ratio	.21	.19	.02	.01
Debt-to-Equity	-.33	-.33	-.19	-.11
Long-term Debt to Assets	-.33	-.39	-.26	-.27
Fixed Asset Turnover	-.06	-.05	-.03	-.03
Total Asset Turnover	-.28	-.28	-.16	-.16
Return on Assets	-.12	-.05	-.11	-.01
Return on Equity	-.14	-.16	-.11	-.13
Interest Coverage	.00	.01	-.06	-.09
Total Assets	-.39	-.38	-.19	-.19

MV/BV = (stock price per share six months after year end/book value per share at fiscal year end in applicable GAAP)

Sample Size = 87

positively correlated with *MV/BV* while debt-to-equity and long-term debt to assets are negatively correlated. The correlation with interest coverage is small.

Amir et al. (1993) find positive associations between the return on equity ratio and *MV/BV*. The implication is that the market rewards companies that have shown profits. In this study, however, negative correlations are found for return on assets and return on equity in both US and Canadian GAAP. A review was made of the companies with low return on equity and yet high *MV/BV* ratios. These companies have negative income and thus negative return on equity. Some of these are small, fairly young companies with several years of negative earnings, resulting in very negative retained

earnings, and low book value of equity. The market values the stock beyond the book value however. The market appears to be valuing the stock not based on past profits, but on the potential for future profits.

For a similar reason, efficiency ratios may vary inversely with MV/BV . Small, upstart companies may not yet be generating sufficient revenues to have strong efficiency ratios. This condition may be particularly true of the many young mining companies included in the sample. The mines may not yet be sufficiently developed sufficiently to produce in heavy volume. Yet the market values these companies based on production potential.

The MV/BV was regressed on seven of the eight accounting ratios. Interest coverage was excluded because the calculation of this ratio in US GAAP was not available for eleven companies. Including the ratio would have resulted in a substantial decrease in the sample. The same process used for the debt rating tests was used for the market-to-book value tests. The ADJRSQ option in SAS was used to develop the best Canadian GAAP model. However, this and all other MV/BV models suffer from severe heteroskedasticity and non-normality of the error term problems. One solution to severe violations of the assumptions of ordinary least squares regression is to use estimators that do not require that the assumptions hold. One such approach is to use nonparametric regression (Conover 1980). Nonparametric regression does not require the same linear assumptions that are part of ordinary least squares. This approach consists of ranking the values of the dependent and independent variables and employing regression on the ranks. All observations used in ordinary least squares are available for use in the

analysis. This approach also has an intuitive appeal for those who use ratio analysis for purposes of ranking investment possibilities.

Nonparametric Tests

The same seven accounting ratios are first used to develop the best model in Canadian GAAP. The best adjusted R^2 model consists of the total asset turnover, long-term debt to total assets, return on equity, and fixed asset turnover. The results of the test are found in Table 6, Panel A. The adjusted R^2 in Canadian GAAP is .204. The Canadian GAAP has significant information at the .0001 level. When these variables in US and Canadian GAAP are combined, adjusted R^2 increases to .266. The multiple-partial F test results indicate that US GAAP adds incrementally to Canadian GAAP at the .035 significance level.

The second approach is to add variables from the best model in US GAAP to the best Canadian GAAP model. The best US model consists of four variables: total asset turnover, long-term debt to assets, return on assets, and fixed asset turnover. When both models are combined, adjusted R^2 equals to .266. This model also produces evidence that US GAAP provides incremental information at the .035 significance level. The evidence is sufficient to conclude that US GAAP provides incremental information value to Canadian GAAP in explaining the market-to-book ratio.

The third approach is to include all seven variables in the test of the hypothesis. The results are found in Table 6, Panel B. Under this approach, the Canadian GAAP model has significance at the .002 level. The addition of variables in US GAAP provides information incremental to that in Canadian GAAP at the .115 significance level. One

TABLE 6

**RESULTS OF TESTING FOR INCREMENTAL VALUE OF US GAAP
RESTATEMENTS WITH MARKET-TO-BOOK VALUES**

Non-Parametric Regression			
BEST CANADIAN MODEL			
Panel A	Canadian GAAP	US GAAP Added to Canadian GAAP	US GAAP in Best US Model Added to Canadian GAAP
R^2	.241	.334	.334
R_a^2	.204	.266	.266
F	6.510	2.736	2.725
df	4, 82	4, 78	4, 78
p -val	.0001	.035	.035

ALL VARIABLE MODEL		
Panel B	Canadian GAAP	US GAAP Added to Canadian GAAP
R^2	.244	.353
R_a^2	.177	.227
F	3.633	1.733
df	7, 79	7, 72
p -val	.002	.115

Best Canadian Model consists of ratios that produce the highest adjusted R^2 in Canadian GAAP. Consists of long-term debt of assets, total asset turnover, return on equity, fixed asset turnover.

Best US Model consists of ratios that produce the highest adjusted R^2 in US GAAP. Consists of total asset turnover, long-term debt to assets, fixed asset turnover, return on assets.

All Variable Model consists of seven ratios: long-term debt to assets, debt-to-equity, current ratio, return on assets, return on equity, total asset turnover, fixed asset turnover.

$$\text{Test Statistic} = F \text{ statistic} = \frac{(\text{Sum of Squares [Full Model]} - \text{Sum of Squares [Original]})/k}{\text{MSE (Full)}}$$

$$df = k, n-p-k-1$$

SS (Full) = Sum of squares (Full Model) of variables in both US and CAN GAAP

SS (Original) = Sum of squares (Original Model) of variables in original GAAP Model

k = Number of variables added in the full model, not included in original model

p = Number of variables in the original model

MSE (Full) = Mean squared error (Full Model)

R_a^2 = adjusted R^2

n = sample size = 87

possible explanation for this result is that as the number of variables expands to include the full model, some variation in the dependent variable previously explained only by US GAAP variables is now partially explained by additional Canadian variables.

In summary, the results from the nonparametric analysis provide significant evidence that the restatement of Canadian financial statements to US GAAP provides incremental information to the information available in Canadian GAAP for explaining the MV/BV .¹¹

¹¹ Another statistical approach is to use parametric regression with transformed data. This approach, however, has the drawback that transformed data loses its intuitive meaning to users of accounting information. Using a power transformation of $\frac{MV/BV^{-.28} - 1}{-.28}$, the dependent variable was transformed. With this transformation, the assumptions of normality and homoskedasticity are not violated. Combining the “best” Canadian model with the “best” US model, information value is found in US GAAP at the .082 significance level. These results are supportive of the nonparametric results.

CHAPTER 7

CONCLUSION

In recent years, there has been considerable debate concerning whether the SEC should continue to require Canadian companies listed on US exchanges to reconcile accounting practices to US GAAP or whether it should permit reciprocity. The motivation behind this study was to provide empirical evidence relevant to this reconciliation-reciprocity debate.

A theoretical framework for the potential information value in reconciliations has been presented. A sample of Canadian financial statements was collected, and then restated to US GAAP. These statements were used to calculate ratios in US and Canadian GAAP. The descriptive analysis demonstrates that the restatement of financial statements to US GAAP significantly changes the value of ratios for Canadian companies.

Statistical test procedures have been used to examine whether the restatement of ratios to US GAAP provides incremental information value in explaining the variability of debt ratings and market-to-book values. At conventional significance levels, the debt ratings tests fail to show that the restatement of variables to US GAAP provides incremental information to the information already available in Canadian GAAP. To avoid violations of assumptions of linear regression, nonparametric analysis is employed with the market-to-book value tests. Using this approach, US GAAP is found to possess significant incremental information.

Implications

To investigate the merits of the reconciliation requirement, previous research involving Canadian companies has focused on the use of the reconciliation of earnings in explaining stock returns. Results of that research have been mixed, with some studies concluding that reconciliation adds little or no information. However, there are many potential uses for financial reporting besides explaining stock return. There are also other accounting numbers besides earnings which potentially possess information. Therefore, there is potential value in US GAAP reconciliations beyond what has been previously researched. This study attempts to tap into that potential value by employing accounting ratios as explanatory variables. The study then investigates the information value of ratios restated to US GAAP with respect to two variables of economic significance: debt ratings and market-to-book values.

The results find that ratios restated to US GAAP add to the information contained in Canadian GAAP ratios in explaining market-to-book values. This result suggests that the differences between US and Canadian GAAP are meaningful. It provides support for the continuation of reconciliation. Finding information in the US GAAP reconciliation for one use of accounting information, however, does not necessarily imply that US GAAP adds value for other uses. The results from this study fail to show that the restatement of financial statements to US GAAP provides incremental information in explaining debt ratings of Canadian companies. Thus the debt rating tests fail to provide additional support for reconciliation.

Limitations and Extensions

This study examines only those companies which choose to list on US exchanges and prepare reconciliations. Thus, the sample may represent a self-selection bias. It is possible, for example, that companies which would report large differences between US and Canadian GAAP choose not to list on US exchanges. Therefore, the sample in this study may not be representative of all Canadian companies. However, this sample does have representation from small companies listed on NASDAQ as well as long-established companies on the NYSE.

The debt rating tests in particular suffer from a small sample size. Therefore, the power of these tests may be low. It is possible that with a larger sample, results may show that restatement to US GAAP provides incremental information. However, such a result cannot be concluded based solely on this study.

The sample of financial statements is limited to a narrow time interval: fiscal years ending between December 1994 and December 1995. Results for this study may not extend to other time periods. However, there is also good reason to limit the time frame for this study. Differences in GAAPs are not static, but change as standards change. Policy makers are interested in the potential value of reconciling Canadian financial statements given the current state of accounting differences, and the accounting differences of some previous time are not germane to current policy debate. To increase the relevance of this study, only recent financial statements were used.

This study investigates whether there are benefits from reconciliation. However, the process of preparing reconciliations is costly. There may be Canadian companies that do not list on US exchanges solely for cost reasons. A complete consideration of the

reconciliation-reciprocity debate must weigh both the costs and benefits of reconciliation. It may be that the costs of reconciliation exceed the benefits obtained.

Accounting variables are known to vary by industry. A worthwhile extension would involve investigating whether restatement affects the value of accounting variables of some industries more than that of other industries. The industry effect could be added to an analysis of the effect of restated accounting variables on debt and equity variables.

The SEC considers its primary mission to be that of protecting the investor. It has a particular interest that investors be warned of companies that may be experiencing financial difficulty. Therefore, it would be worthwhile to investigate whether the restatement to US GAAP helps to predict which companies will experience bankruptcy or other financial difficulties.

In conclusion, this study relates directly to the ongoing reconciliation-reciprocity issues before the SEC. However, it also pertains to the broader issue of accounting harmonization. The worldwide harmonization of accounting reporting practices is appropriate only if the process of harmonization provides information value. This study can be seen as a micro-level test of harmonization, limited in scope to the harmonization to US accounting principles.

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APPENDIX

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD
HUMAN SUBJECTS REVIEW

Date: 02-23-96

IRB#: BU-96-012

Proposal Title: THE EFFECT OF US-CANADA GAAP DIFFERENCES ON RATIO
ANALYSIS AND NON-STOCK MARKET VARIABLES

Principal Investigator(s): Gary Meek, Glade Tew

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

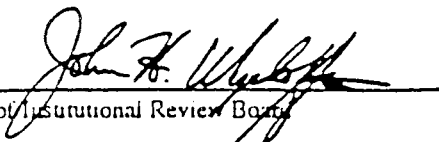
ALL APPROVALS MAY BE SUBJECT TO REVIEW BY FULL INSTITUTIONAL REVIEW BOARD
AT NEXT MEETING.

APPROVAL STATUS PERIOD VALID FOR ONE CALENDAR YEAR AFTER WHICH A
CONTINUATION OR RENEWAL REQUEST IS REQUIRED TO BE SUBMITTED FOR BOARD
APPROVAL.

ANY MODIFICATIONS TO APPROVED PROJECT MUST ALSO BE SUBMITTED FOR
APPROVAL.

Comments, Modifications/Conditions for Approval or Reasons for Deferral or Disapproval
are as follows:

Signature:


Chair of Institutional Review Board

Date: February 28, 1996

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VITA

Glade Kelvin Tew

Candidate for the Degree of

Doctor of Philosophy

Thesis: THE EFFECT OF RESTATING CANADIAN FINANCIAL STATEMENTS TO US GAAP ON ACCOUNTING, RATIOS, DEBT RATINGS, AND MARKET-TO-BOOK VALUES

Major Field: Business Administration

Area of Emphasis: Accounting

Biographical:

Personal Data: Born in Covina, California, on February 16, 1959, the son of Melvin B. and Derena Tew.

Education: Graduated from Piedmont Hills High School, San Jose, California, in June 1977; received Bachelor of Science degree in Accounting from Brigham Young University, Provo, Utah in April 1983; received Master of Accountancy degree from Southern Utah University, Cedar City, Utah in June 1992; completed the requirements for the Doctor of Philosophy degree with a major in Business Administration at Oklahoma State University in May 1997.

Professional Experience: Assistant Professor, School of Business, Brigham Young University -- Hawaii Campus, August 1996 to present; Teaching Assistant, Department of Accounting, Oklahoma State University, August 1992 to May 1996.

Professional Membership: American Accounting Association, Certified Public Accountant (Utah).