

An Investigation of Accounting Method Choices of Multinational Corporations

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<Abstract>

The main purpose of this study is to empirically investigate whether U.S. domestic corporations (DCs) are more likely to use income-increasing accounting method choices than U.S.-based multinational corporations (MNCs). This study focuses on the effects of the debt-equity ratio, the firm size, and the growth opportunities on accounting method choices and introduces measures of multinationality to evaluate the differences in accounting method choices between MNCs and DCs. Three accounting procedure choices are evaluated in this study by using logistic regression analysis : inventory cost valuation, depreciation method, and goodwill amortization period. Empirical documentation of the systematic differences in accounting method choices between multinational and domestic corporations can help users of accounting information to assess the usefulness of accounting earnings of MNCs and DCs.

다국적기업의 회계방법선택에 관한 연구

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<요 약>

본 연구의 목적은 국내기업들이 상대적으로 다국적기업들과 비교하여 당기순이익을 증가시키는 회계방법선택을 보다 많이 사용하는지의 여부를 실증적으로 분석하는 데 있다. 본 연구의 목적을 달성하기 위해 본 연구에서는 부채비율변수, 기업규모변수, 투자기회변수를 사용하여 이 변수들이 회계방법선택에 미치는 영향을 분석하고, 그리고 다국적기업과 국내기업의 회계방법선택의 차이를 평가하기 위해 다국적기업 측정변수를 도입하여 설명변수로 사용하고 있다. 본 연구에서는 로지스틱 회귀모형분석을 사용하여 재고자산 평가방법, 유형자산의 감가상각방법 및 영업권 상각연수 등 세 가지 회계방법선택을 실증적으로 평가하고 있다. 다국적기업과 국내기업의 회계방법선택의 차이에 관한 본 논문의 결과는 다국적기업과 국내기업의 당기순이익을 평가하는 데 도움을 줄 수 있을 것이다.

I. Introduction

A considerable amount of accounting research effort has been devoted over the last two decades towards an understanding of the determinants of corporate accounting methods. It is believed that accounting policy choices have real economic effects [Holthausen and Leftwich (1983), Watts and Zimmerman (1990), Christie (1990)]. Most previous studies view the choices of accounting method as a function of managers' incentives to behave opportunistically. These studies investigate the determinants of management's accounting method choices by focusing on incentives derived from explicit claims (e.g., debt contracts, bonus plans, and political costs, etc.) In general, these studies find that firms' choices of accounting methods are systematically related to these determinants of accounting method choices.

The main purpose of this study is to empirically investigate whether U.S. domestic corporations are more likely to use income-increasing accounting method choices than U.S.-based multinational corporations. This study focuses on the effects of the debt-equity ratio, the firm size, and the growth opportunities on accounting method choices and introduces measures of multinationality to evaluate the differences in accounting method choices between MNCs and DCs.

Three accounting procedure choices are evaluated in this study by using logistic regression analysis: inventory cost valuation, depreciation method, and goodwill amortization period. Empirical documentation of the systematic differences in accounting method choices between multinational and domestic corporations and the underlying factors that explain these differences can help users of accounting information to assess the usefulness of accounting earnings of MNCs and DCs.

The remainder of this study is organized as follows. Section II briefly summarizes existing theories and previous studies concerned with this study, and Section III discusses research questions. Section IV specifies the research design and develops

measurements for accounting method choices and various determinants of accounting policy choices (firm size, debt-equity ratio, growth opportunities, corporate multinationality) discussed in this study. Section V presents research findings and Section VI discusses conclusions and limitations of this study.

II. Literature Review

Watts and Zimmerman (1978) hypothesize that larger firms tend to adopt accounting methods that reduce reported income because lower reported earnings result in benefits from the perspective of political and regulatory considerations (the firm-size hypothesis). Managers of firms with earnings-based bonus plans are more likely to use accounting methods that increase current-period reported income because such selections increase the present value of their bonuses. The generally accepted debt-equity hypothesis states that reliance of debt covenants on accounting numbers can influence accounting method choices. A positive relation between a firm's debt-equity ratio and the use of income-increasing accounting procedures is usually interpreted as evidence that managers choose income-increasing accounting procedures to loosen debt covenant constraints [Bowen, Noreen, and Lacey (1981), Holthausen (1981), Zmijewski and Hagerman (1981), Holthausen and Leftwich (1983), Watts and Zimmerman (1978, 1986, 1990)]

Studies of multinational and domestic corporations have received much attention in business literature, yet relatively few studies have systematically evaluated accounting policy decisions of multinational corporations (MNCs) and those of domestic corporations (DCs). Differences in accounting method choices between DCs and MNCs are expected because of dissimilarities in several underlying firm-characteristics of MNCs and DCs (firm size, investment opportunity sets, and debt-equity ratio). MNCs may be expected to use accounting choices that reduce profits based on the firm-size hypothesis because, in general, the size of MNCs is greater than that of DCs.

Growth opportunities (investment opportunity sets) are of great importance to modern corporations since they account for a large fraction of a typical firm's market value. Several recent finance and accounting studies show that the debt-equity ratio is affected by the firm's future growth opportunities [Smith and Watts (1992), Gaver and Gaver (1993), Skinner (1993), and Homaifar, Zietz, and Benkato (1994), Chen, Cheng, He, and Kim (1997)]. Watts and Zimmerman (1990) suggest that accounting method choices depend on the firm's investment opportunity set (future growth opportunities) which is correlated with the firm's financing policies. Skinner (1993) provides evidence of the indirect cross-sectional relation between the firm's investment opportunities and its accounting policy choices through the relationship between corporate future growth opportunities and its effect on the debt-equity ratio. Based on the debt-equity

hypothesis, this study shows that non-growth firms are more likely to use income-increasing accounting procedure choices than growth firms.

Most MNCs have a higher proportion of future growth options (investment opportunity sets) than that of DCs. These future growth options are intangible assets, the value of which depends on future discretionary investments. When the asset structure of MNCs is analyzed, it is expected that MNCs will have a higher proportion of future growth options than that of DCs because intangible assets are less vulnerable to expropriation by host governments while assets already in place are more politically appropriable. Furthermore, Kim and Lyn (1986) state that MNCs possess monopolistic advantages which enable them to outperform local companies in host countries. These monopoly rents are reflected by the value of future growth options of the company. If there is evidence of higher growth opportunities for MNCs and lower growth opportunities for DCs, *ceteris paribus*, DCs (mostly non-growth firms) are more likely to use income-increasing accounting choices than MNCs (mostly growth firms).

Many researchers believe that multinational corporations tend to be more highly leveraged than domestic corporations because the cash flows of multinational corporations are internationally diversified and, consequently, multinational corporations are in a better position than domestic corporations to support higher debt ratios [Hughes, Logue, and Sweeney (1975), Agmon and Lessard (1977), Shapiro (1978)]. However, several recent studies indicate that firms with notable foreign involvement have target leverage ratios significantly below those of their domestic counterparts [Michel and Shaked (1986), Fatemi (1988), Lee and Kwok (1988), Chen, Cheng, He, and Kim (1997)]. Based on the debt-equity hypothesis, if there is evidence of higher target debt ratios for U.S. domestic corporations and lower target debt ratios for U.S.-based multinational corporations, *ceteris paribus*, managers of DCs should have stronger incentives to select income-increasing accounting procedures than those of MNCs.

III. Research Question

This study intends to determine whether or not MNCs and DCs behave differently in making accounting method choices characterized by income-increasing or income-decreasing alternatives. Three accounting method choices are evaluated in this study: inventory cost valuation, depreciation method, and goodwill amortization period.

The main research question investigated in this study is whether DCs are more likely to use income-increasing accounting method choices than MNCs. Multinationality (MUL), the main variable in this study, is identified to determine the differences in accounting method choices between DCs and MNCs in addition to the traditional determinants of accounting method choices. Three firm-characteristics (firm size, debt ratio, growth opportunities) are identified as the potential explanations for adopting

these different accounting method choices between MNCs and DCs.

The debt-equity hypothesis predicts that the higher the firm's debt-equity ratio is, the closer the firm is to the constraints in the debt covenants. Managers of the high debt-equity ratio firms will exercise discretion by choosing income-increasing accounting methods to relax debt constraints and to reduce the costs of technical default

As discussed in Section II, there are two conflicting predictions for the cross-sectional variations of debt-equity ratios or debt ratios between MNCs and DCs (increasing the target debt-equity ratios or decreasing the target debt-equity ratios of MNCs). A multinational firm may be able to push itself into a higher debt-equity ratio without increasing its expected bankruptcy costs since the earnings of MNCs are less volatile than those of DCs by the virtue of being diversified internationally and international operations result in reduced riskiness of the firm. If it is true that MNCs have lower bankruptcy costs of debt associated with international diversification than those of DCs, then MNCs are more likely to issue debt than DCs and these firms (MNCs) are also more likely to have accounting-based debt covenants. Thus, MNCs are more likely to use income-increasing accounting method choices than DCs based on the debt-equity hypothesis

However, the results obtained by Fatemi (1988), Lee and Kwok (1988), and Chen, Cheng, He, and Kim (1997) indicate that MNCs have target leverage ratios significantly below those of their domestic counterparts (DCs), possibly due to the greater agency costs of debt associated with international diversification [higher agency costs of debt for MNCs according to Myers (1977) and higher agency costs of debt for MNCs according to Jensen and Meckling (1976)]. If it is true that MNCs have lower debt-equity ratios or debt ratios than DCs, DCs are more likely to use income-increasing accounting method choices than MNCs based on the debt-equity hypothesis

In recent years, a number of papers have discussed robust empirical relations between debt-equity ratios and growth opportunities (investment opportunity set, IOS) [Smith and Watts (1992), Gaver and Gaver (1993), Skinner (1993), and Homaifar, Zietz, and Benkato (1994)] These studies suggest that firms with significant growth opportunities are expected to have lower debt-equity ratios because equity financing controls Myers' potential underinvestment problems (1977) associated with risky debts

Skinner (1993) investigates an indirect relationship between corporate growth opportunities, through its effect on debt-equity ratios, and accounting method choices His study shows if non-growth firms are more likely to issue debt than growth firms based on contracting theory (agency theory), these firms also are more likely to have accounting based debt covenants The debt-equity hypothesis predicts that higher debt-equity ratios are associated with the use of income-increasing accounting procedures which are used to loosen debt-covenant constraints. Consequently, non-growth firms are more likely to use income-increasing accounting procedure

choices than growth firms based on the debt-equity hypothesis. As discussed in Section II, most MNCs have a higher proportion of future growth options than that of DCs. Therefore, DCs (mostly non-growth firms) are more likely to use income-increasing accounting choices than MNCs (mostly growth firms) based on the debt-equity hypothesis.

Chen, Cheng, He, and Kim (1997) find that MNCs have lower debt-equity ratios even after controlling for growth opportunities (Myers' agency costs of debt). Thus, multinationality itself does provide additional information to explain MNCs' lower debt-equity ratios in addition to the effect of higher growth opportunities of MNCs on accounting method choices. MNCs are expected to incur higher agency costs of debt than DCs with regard to Jensen and Meckling's (1976) asset substitution problem. One disadvantage of MNCs is that they operate in a more complex political and institutional environment than their counterparts (DCs). Fatemi (1988) and Lee and Kwok (1988) state that because of the complexity of international operations, agency costs due to monitoring and bonding costs of MNCs are expected to be higher than those of DCs. Simunic (1980) also finds a positive relationship between auditing fees and the degree of foreign involvement of the company. Geographic dispersion of MNCs increases auditing costs (monitoring costs) substantially.

Since MNCs are expected to incur additional higher agency costs of debt according to Jensen and Meckling (higher monitoring costs and bonding costs) than DCs in addition to higher agency costs of debt according to Myers, the optimal leverage points of MNCs will be lower than those of DCs after controlling for growth opportunities. Thus, DCs are more likely to use income-increasing accounting method choices than MNCs based on the debt-equity hypothesis in addition to the effect of higher growth opportunities of MNCs through its effect on the debt-equity ratios.

Firm size (political costs) is an important factor to consider when examining management choices of accounting methods. MNCs may be expected to use accounting method choices that reduce profits because, in general, the size of MNCs is greater than that of DCs. Thus, the fact that MNCs have fewer income-increasing accounting method choices compared to those of DCs can be explained partially by MNCs' incentives to reduce reported profits in order to avoid or minimize political costs.

Therefore, if there is evidence that MNCs have larger firm sizes, higher investment opportunity sets (growth firms), and lower target debt-equity ratios than those of DCs, then managers of DCs have stronger incentives to choose income-increasing accounting procedure choices than those of MNCs (see Figure 1).

VI. Research Methodology

4.1 Empirical Models

A model of the cross-sectional variation in corporate policy decisions (accounting method choices) requires specification of determinants of corporate policy decisions that drive policy selection. Four determinants of accounting method choices are identified in this study - multinationality (MUL), firm size (SIZE), debt ratio (DR), and investment opportunity set (IOS). Four models are tested in this study to investigate whether DCs are more likely to use income-increasing accounting method choices than MNCs as followings

$$\text{Model 1} \quad \text{AMC} = a1 + b1 \text{ MUL} + u1 \quad (1)$$

$$\text{Model 2} \quad \text{AMC} = a2 + c2 \text{ SIZE} + d2 \text{ DR} + e2 \text{ IOS} + u2 \quad (2)$$

$$\text{Model 3} \quad \text{AMC} = a3 + b3 \text{ MUL} + c3 \text{ SIZE} + u3 \quad (3)$$

$$\text{Model 4} \quad \text{AMC} = a4 + b4 \text{ MUL} + c4 \text{ SIZE} + d4 \text{ DR} + e4 \text{ IOS} + u4 \quad (4)$$

where, AMC - accounting method choices of firm i (income-increasing or income-decreasing inventory valuation, depreciation method, and goodwill amortization period),

SIZE - firm size of firm i,

DR - debt ratio of firm i,

IOS - future growth opportunities (investment opportunity set) of firm i,

MUL - multinationality of firm i, dummy variable (1=MNCs, 0=DCs).

Model 1 is the main focus of this study for testing whether DCs are more likely to choose income-increasing accounting method choices than MNCs. If MNCs have higher debt-equity ratios (or debt ratios), larger firm sizes, and higher proportion of growth opportunities associated with international diversification than those of DCs, then DCs are more likely to use income-increasing accounting method choices than MNCs

Model 2 tests whether the higher the firm's debt-equity ratio, the more likely managers to use accounting method choices that increase income and whether large firms rather than small firms are more likely to use accounting method choices that reduce the reported income. This model is to test for the reconfirmation of Watts and Zimmerman's (1978, 1986, 1990) traditional political cost hypothesis and debt-equity hypothesis. They state that the firm size is a proxy variable for political attention. The debt-equity hypothesis predicts that the higher the firm's debt-equity ratio is, the

more likely to use income-increasing accounting methods to relax debt constraints and to reduce the costs of technical default. This model also investigates the effect of growth firms and that of non-growth firms on accounting method choices after controlling for firm size and debt ratio effects and reconfirms Skinner's (1993) indirect test about the relationship between corporate growth opportunities, through their effects on debt-equity ratios, and accounting procedure choices. Firms with relatively more assets in place (non-growth firms) will be more highly leveraged than firms whose value is comprised principally of future growth opportunities (growth firms). If non-growth firms are more likely to issue debt than growth firms based on contracting theory, these firms are also more likely to have accounting-based debt covenants. Therefore, non-growth firms are more likely to use income-increasing accounting procedure choices than growth firms based on the debt-equity hypothesis.

Model 3 tests the additional power of multinationality after controlling for the firm size (political costs). Model 4 tests the additional power of multinationality after controlling for all three determinants (SIZE, DR, and IOS). In this model, firm size (SIZE), debt ratio (DR), and growth opportunities (IOS) would be controlled to ensure that the effects of multinationality on accounting method choices are not due to firm size, debt ratio, or IOS effects.

4.2 Measurement of Variables

4.2.1 Accounting Method Choices

The logistic regressions are used in this study to investigate differences in accounting procedure choices between MNCs and DCs. Three accounting methods are investigated in this study: inventory valuation, depreciation method, and goodwill amortization period.

For the inventory cost valuation, the choice of all or dominant first-in-first-out (FIFO) is labeled as income-increasing and assigned a score of 1 while the choice of all or dominant last-in-first-out (LIFO) or mixed method (Mix) is labeled as income-decreasing and assigned a score of 0. The average cost method for inventory or the combination of FIFO and LIFO are characterized as the mixed method (Mix). This assumes that in a given year, input prices are rising and firms using LIFO do not liquidate layers. One shortcoming of examining this accounting method choice is that the inventory choice (particularly, LIFO inventory choice) may reflect tax-minimization as well as financial reporting incentives [Biddle and Lindahl (1982), Dopuch and Pincus (1988)].

For the depreciation method, the choice of all or dominant straight-line method (SL) is labeled as income-increasing and assigned a score of 1 while the choice of all or dominant accelerated depreciation (Accelerated) or mixed method (Mix) is labeled as income-decreasing and assigned score of 0. The unit-of-production depreciation (UP)

or the combination of SL and accelerated methods are characterized as the mixed method (Mix). This assumes that in any given year, firms maintain their levels of depreciable assets. If not, the accelerated depreciation method may produce lower depreciation expense than SL.

For the goodwill amortization period, a 40-year goodwill amortization period (40 years, the maximum amortization period) is considered as income-increasing and assigned a score of 1 while a goodwill amortization periods of less than 40 years (Less than 40 years) are characterized as income-decreasing and assigned a score of 0. Therefore, the score 0 is classified as income-decreasing method choices and the score 1 is classified as income-increasing method choices for each of three accounting procedure choices used in this study.

4.2.2 Explanatory Variables

Four determinants of accounting method choices are identified in this study : firm size (SIZE), debt ratio (DR), investment opportunity set (IOS), and multinationality (MUL) The market debt ratio is used as a debt proxy in this study. The reason for using market debt ratio is that the market-value data is better representing the theory of optimal capital structure and accounting method choices [Titman and Wessels (1988), Lee and Kwok (1988), Skinner (1993)]. Definition of the debt ratio (DR) is as followings :

$$\text{Debt Ratio} = (\text{Long-Term Debt}) / (\text{Market Value of Equity} + \text{Long-Term Debt})$$

where, Market Value of Equity = Shares closing price x Shares outstanding.

This study uses the foreign tax ratio as the measurement of multinationality. The various criteria for defining the multinational corporations have been used in previous studies, yet there is no one single definition that is generally accepted in business studies. Some definitions emphasize structural characteristics (e.g., the number of countries in which a firm is doing foreign operations) while others stress performance characteristics (e.g., foreign sales or foreign earnings) Many of the previous studies used foreign sales ratio (foreign sales / total sales) as a measure of multinationality [Fatemi (1988), Michel and Shaked (1986)]. There are some advantages with the foreign tax ratio measure of multinationality in this study because most of the companies listed in the COMPUSTAT tapes can be used and consequently larger samples can be obtained for both multinational corporations and domestic corporations compared to the small samples of the foreign sales ratio. The foreign taxes which are imposed on income made by foreign subsidiaries seem to be a more appropriate proxy for measuring the level of foreign investment than foreign sales. Using the foreign tax ratio as the criterion, companies were separated into samples of multinational corporations and domestic corporations. The sample of domestic corporations consists

of companies which had foreign tax ratios of being equal to 0% while the sample of multinational firms includes companies with foreign tax ratios greater than 0%. Definition of the multinationality variable (MUL, dummy variable) is as followings

$$\begin{aligned} \text{MUL} &= 1, \text{ if the foreign income tax ratio} > 0\%, \\ \text{MUL} &= 0, \text{ if the foreign income tax ratio} = 0\%, \end{aligned}$$

where, the foreign tax ratio = the foreign tax / [the foreign tax + the domestic tax]

There is no consensus in accounting and finance literature concerning an approximate proxy for the IOS (growth opportunities) because future growth opportunities are unobservable. The ratio of R&D expenses to total value of assets is used as a proxy for the IOS in this study [Gaver and Gaver (1993), Skinner (1993), and Titman and Wessels (1988)]. The higher the ratio of R&D expenses to total assets is, the higher the growth opportunities to firm value. Definition of the growth opportunity variable (IOS) is as followings

$$\text{IOS} = (\text{R\&D expenses}) / (\text{Total Assets}).$$

The logarithmic transformation for firm size is employed because the distribution of assets is highly skewed. The logarithm of total assets as the measurement of the firm size is qualitatively identical to the logarithm of sales as the size measure [Gaver and Gaver (1993)]. Definition of the firm size variable is as followings

$$\text{SIZE} = \text{LOG} (\text{Total Assets}).$$

4.3 Sample Selection

The population of this study is US-based multinational (MNCs) and domestic corporations (DCs). Sample firms are identified from 1993 Compustat Industrial Database. The sample is retrieved from Compustat firm year observations (1993) with data available, including foreign income tax and domestic income tax. If either foreign income tax or domestic income tax is negative, then the observations are deleted from the sample. Firm observations are classified as domestic (MUL=0) if foreign income tax equals zero and they are classified as multinational (MUL=1) if foreign income tax is positive. This sample selection procedure results in 533 DCs and 520 MNCs observations available for 1993.

Regulated firms are excluded from the samples with SIC codes 4000-5000 since there may exist systematic relations between the regulation and the firm's accounting policy decisions, and between the regulation and debt-equity ratios. The possible data

collection constraint is the availability of these firms' accounting procedure choices. These data are obtained from 1993 COMPUSTAT tapes for the inventory cost valuation and the depreciation method, and firm's annual reports primarily from the footnote for the goodwill amortization period, where firms generally disclose their goodwill accounting policies.

4.4 Statistical Methods

The logistic regressions are used in this study to investigate different accounting procedure choices between MNCs and DCs and the underlying factors for the differences of accounting method choices between DCs and MNCs. Logit or probit has been one of the primary methods used in studies of accounting method choices or bankruptcy prediction [e.g., Zmijewski and Hagerman (1981), Dopuch and Pincus (1988), etc]. Logit or probit has been argued to be theoretically superior to both multivariate discriminant analysis and ordinary least square (OLS) regression in classification research [Dietrich and Kaplan (1982)].

Probit and logit parameters are typically estimated by a method called maximum likelihood estimation in contrast to ordinary regression models which are estimated by the method of least square. The maximum likelihood estimation on models is nonlinear and their properties are asymptotic, thus it is better as sample size increases. Both logit and probit analysis arise from the need to analyze qualitative (dichotomous or polychotomous) dependent variables within the regression framework while OLS regression has shown to be inadequate when dependent variable is discrete. Logit uses the cumulative logistic probability function (nonlinear) to transform the predictor variables, while probit uses the normal probability function.

Amemiya (1981) suggests that it does not matter whether one uses a probit or logit model in the univariate dichotomous model, except in cases where data are heavily concentrated in the tails. Maddala (1991) also suggests that there is usually not much to choose from between the logit and the probit models, except that, when it comes to the analysis with matched samples (bankrupt firms matched with non-bankrupt firms considered similar in all other respects), the logit model is more convenient. The use of logit instead of that of probit in the previous studies of accounting method choices should be viewed as a reflection of software availability rather than as an important element of the research design.

There are theoretical and econometric reasons for preferring logit or probit to OLS when the response variable is discrete and the sample size is large, however, it is not clear when the sample size is small [Amemiya (1981), McFadden (1982)]. Noreen (1988) discusses that probit offers no real advantage over OLS for sample sizes of fewer than 100. Stone and Rasp (1991) show the results of Monte Carlo simulation that logit test statistics are biased when the sample size is small. However, they argue that even for

sample sizes as small as 50, logit rather than OLS still may be the preferable model for accounting choice studies

Logit analysis fits linear logistic regression models for binary or ordinal response data by the method of maximum likelihood. Logit analysis can be used in univariate or multivariate analysis, and dichotomous or polychotomous classification models

V. RESEARCH FINDINGS

The primary objective of this study is to empirically explore whether U.S. domestic corporations (DCs) are more likely to adopt income-increasing accounting method choices than U.S.-based multinational corporations (MNCs). Three accounting procedure choices are evaluated in this study: inventory cost valuation, depreciation method, and goodwill amortization period.

5.1 Descriptive Statistics

Table 1 presents the descriptive statistics for the full sample (All) and for the domestic (DCs) and multinational (MNCs) samples respectively. On average, the firm size (total assets, billions of dollars) for MNCs is 5.506, which is significantly larger than that of DCs (1.884), and the debt ratio (DR, the ratio of long-term debt over the market value of total invested capital) for MNCs is 0.184, which is significantly below that of DCs (0.201) as expected. MNCs, in general, have significantly higher investment opportunity sets (IOS, R&D expenses over total assets) as expected. The mean value of IOS for MNCs is 0.026, while that of IOS for DCs is 0.007.

Table 2 presents the correlation coefficients of the firm-characteristic variables under consideration in this study, except the accounting choice variables of firms (INV, DEP, and GW). Multinationality (MUL) is positively correlated with SIZE and IOS, but is negatively correlated with DR (debt ratio). This indicates that MNCs are usually larger in size with higher investment opportunity sets (IOS), but lower debt ratio (DR) than those of DCs as expected. Debt ratio (DR) is negatively correlated with investment opportunity sets (IOS), which is consistent with earlier findings, but is positively correlated with SIZE.

5.2 Inventory Valuation

Table 3 provides the estimated coefficients from four logit models of inventory valuation choices. To aggregate inventory valuation choices across firms, the dichotomous scale (0: LIFO or Mix, 1: FIFO method) is developed for measuring the extent to which a given inventory valuation choice can be characterized as

income-increasing or income-decreasing. In each model, the dependent variable is coded as described above (0 or 1) so that a positive coefficient indicates an increase in the probability of choosing a more income-increasing inventory valuation method. The inventory valuation choice likely reflects tax-minimization as well as financial reporting incentives. Previous studies report that the FIFO versus LIFO choice depends on the firms' relative tax positions and on the relative tax benefits of these two accounting choices.

Table 3 presents the estimated coefficients from four logit models of inventory method choices with overall model p-values. The negative coefficient of MUL in Model 1 indicates that MNCs use less income-increasing inventory valuation methods as expected. Model 2 provide evidence on the firm-size hypothesis, the debt-equity hypothesis, and the IOS effects. Consistent with the firm-size hypothesis, the coefficients of firm size are consistently negative across all models (p-values less than 0.01). However, the coefficients of DR are not significant, which is inconsistent with the debt-equity hypothesis. The coefficients of IOS are significant but unexpectedly have positive signs across models. These results are consistent with the results of Skinner (1993), which indicates that the inventory choice of firms more likely reflects the tax minimization effects than the debt-equity hypothesis and IOS effects of the firms (financial reporting incentives).

Model 3 provides the additional power of multinationality after controlling the firm size (political cost). As shown in Table 3, the coefficient of MUL becomes insignificant after controlling the size variable, which means that the size characteristic of MUL is the dominant factor that influences the more income-decreasing inventory choices of multinational firms. Therefore, the SIZE variable is the most important variable to explain the different inventory valuation choices between MNCs and DCs.

5.3 Depreciation Method

Table 4 provides the estimated coefficients from four logit models of depreciation method choices. To aggregate depreciation method choices across firms, the dichotomous scale (0: Accelerated or Mix, 1: SL method) is developed for measuring the extent to which a given depreciation method choice can be characterized as income-increasing or income-decreasing. In each model, the dependent variable is coded as described above (0 or 1) so that a positive coefficient indicates an increase in the probability of choosing a more income-increasing depreciation method.

Table 4 presents the estimated coefficients from the four logit models of depreciation method choices with overall model p-values. The negative coefficient of MUL in Model 1 indicates that MNCs use less income-increasing depreciation methods. Model 2 provides evidence on the firm-size hypothesis, the debt-equity hypothesis, and the IOS effects all considered together. The coefficient of SIZE in Model 2 is not significant

and shows the reverse sign, which is inconsistent with the size hypothesis. This may be due to the issues related to the previous findings of the firm-size hypothesis.

Several previous studies [Zmijewski and Hagerman (1981), Zimmerman (1983), Daley and Vigeland (1983), etc.] related to the firm size effect have shown that the effect of firm size on the choice of accounting method is non-linear. Zmijewski and Hagerman (1981) have shown that variables related to political costs are much less important in explaining the choice of accounting principles for smaller firms than for large firms. They partition their sample into large firm and small firm subsamples and find that the size variable is significant only in the large subsample. The same technique is applied in Daley and Vigeland (1983) with opposite results. For the small firms, both leverage and size are significant at the 0.05 level. Zimmerman (1983) also has shown that the size variable does not explain the choice of accounting principles, as hypothesized, for firms in the trade industry (SIC codes 5000-5999). Therefore, the firm size effects are inconsistent among these studies and suggest that the role of size variables in the choice of accounting methods is not yet well understood.

Inconsistent with the size hypothesis as explained above, the signs of coefficients on firm size in Table 4 are mixed and the coefficients are not significant across all models. However, the coefficients of DR are consistently significant and show positive signs in Model 2 and Model 4, which is consistent with the debt-equity hypothesis. The coefficients of IOS also are significant and have a negative sign in Model 2, which is consistent with the previous findings.

Model 3 provides the additional power of multinationality after controlling firm size (political cost). As shown in Table 4, the coefficient of MUL is still significant after controlling the size variable, which means that the size characteristic of MUL is not the dominant factor to influence more income-decreasing depreciation method of multinational firms. In model 4, the coefficient of MUL is still significant (p -value=0.045) after controlling SIZE, DR, and IOS. This indicates that DR and possibly IOS as well as MUL are more important variables than SIZE variable in explaining different depreciation method choices of firms. Particularly, the coefficients of DR are all statistically significant and show the expected signs across all models.

5.4 Goodwill Amortization Method

Table 5 provides the estimated coefficients from four logit models of goodwill amortization period. To aggregate goodwill amortization period across firms, the dichotomous scale (0: Less than 40 years, 1: 40 years) is developed for measuring the extent to which a given goodwill amortization period can be characterized as income-increasing or income-decreasing. In each model, the dependent variable is coded as described above (0 or 1) so that a positive coefficient indicates an increase in the probability of choosing a more income-increasing goodwill amortization period.

Table 5 presents the estimated coefficients from the four logit models of goodwill amortization period with overall model p-values. The negative coefficient of MUL in Model 1 indicates that MNCs use less income-increasing goodwill amortization period. Model 2 provides evidence on the firm-size hypothesis, the debt-equity hypothesis, and the IOS effects all considered together. Inconsistent with the firm-size hypothesis, as explained above, the signs of coefficients on firm size are mixed and the coefficients are not statistically significant across models. However, the coefficients of DR are consistently significant and show positive signs in Model 2, which is consistent with the debt-equity hypothesis. The coefficients of IOS also are significant and show the negative sign in Model 2, which is consistent with the previous findings.

Model 3 provides the additional power of multinationality after controlling for SIZE (political cost). As shown in Table 5, the coefficient of MUL still is significant after controlling for the size variable, which means that the size characteristic of MUL is not the dominant factor to influence the greater income-decreasing goodwill amortization period of multinational firms. In Model 4, the coefficient of MUL is still significant after controlling for SIZE, DR, and IOS. The coefficients of IOS are all significant with p-value less than 0.01 and show the expected signs across all models, so IOS as well as MUL is an important variable in explaining different goodwill amortization periods of firms.

VI. CONCLUSIONS

This study investigates differences in management's choices of three accounting procedures (inventory valuation methods, depreciation methods, and goodwill amortization periods). If MNCs have lower target debt-equity ratios, larger firm sizes, and higher investment opportunity sets than those of DCs, then managers of DCs have stronger incentives to select income-increasing accounting procedures than those of MNCs.

This study focuses on the effects of debt ratio, firm size, and growth opportunities on accounting method choices and introduces measures of multinationality to evaluate the differences in accounting method choices between DCs and MNCs. Three accounting procedure choices are evaluated in this study by using logistic regression analysis: inventory cost valuation, depreciation method, and goodwill amortization method.

With respect to the choices of inventory valuation, MNCs use less income-increasing inventory valuation methods than DCs as expected. The firm-size hypothesis is strongly supported, however, the debt-equity hypothesis and the effect of growth opportunities are not supported by the choices of inventory valuation. This result indicates that the choices of inventory valuation likely reflects tax-minimization as well

as financial-reporting incentives

With respect to the choices of depreciation methods, MNCs use less income-increasing depreciation methods than DCs. The debt-equity hypothesis and the effect of growth opportunities are strongly supported, however, the firm-size hypothesis is not supported by the choices of depreciation methods. This result may be due to the fact that findings associated with the firm size effect are inconsistent across previous studies and suggests that the role of size variables in the choices of accounting methods is not yet well understood.

With respect to the choices of goodwill amortization periods, MNCs use less income-increasing goodwill amortization periods than DCs. The debt-equity hypothesis and the effect of growth opportunities are strongly supported, however, the firm-size hypothesis is not supported by the choices of firms' goodwill amortization periods. This again may be due to issues related to previous findings of the firm-size hypothesis as described above.

The results reported in this study are partially consistent with the traditional firm-size hypothesis and debt-equity hypothesis which state that there are systematic relations between the choice of accounting procedures. After the firm size, the debt ratio, and the growth opportunity are controlled, this study still find that the multinational activity is a significant determinant in explaining accounting procedure choices of firms. Thus, the important finding of this study is that the multinational activity itself should be another important determinant in explaining firm's choices of accounting procedures beyond the commonly accepted determinants of accounting method choices.

This study may improve our understanding of current accounting research in several ways. There has been speculation in the literature about the effect of growth opportunities (investment opportunity sets, IOS) on accounting method choices indirectly through its effect on debt-equity ratios. This study extends the literature to the effect of firm multinationality on accounting method choices for a large sample of firms (1053 sample firms). The empirical documentation of the systematic differences in accounting method choices between multinational and domestic corporations can help users of accounting information to assess the usefulness of accounting earnings of MNCs and DCs.

There are some limitations in this study. First of all, proxies used in this study for the firm-related attributes such as growth opportunities and multinationality are expressed in terms of fairly abstract concepts which are not directly observable. Any test of the contracting hypothesis is complicated by the difficulty of measuring the investment opportunity sets. Additional research can be directed at continued refinement of the measurement of the investment opportunity sets and the multinationality. Secondly, there is a possibility that accounting procedure choices may be driven by some other variables not investigated in this study (e.g., managerial bonus plans for accounting method choices).

Future research can be conducted by using both time-series and cross-sectional tests of the accounting method choices rather than only cross-sectional test of accounting method choices of firms, with the goal of eliminating alternative explanations for the results reported in this study. Another area for future research is to add more variables of accounting methods in addition to three accounting procedures investigated in this study in order to increase the robustness of evidence beyond that presented in this study.

Figure 1
The Link Between Multinationality and Accounting Method Choices

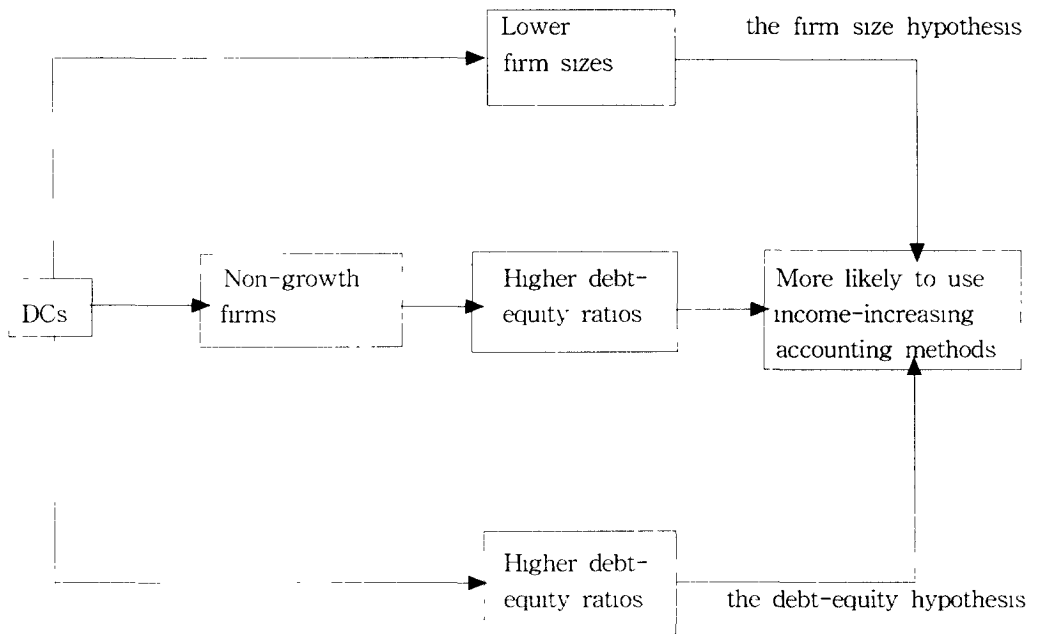


Table 1
Descriptive Statistics

	N	Mean	Std Dev	1 %	25 %	Median	75 %	99 %
1 Firm Size (SIZE) *								
All	1053	3.673	14.489	0.009	0.151	0.529	1.872	58.026
DCs	533	1.884	10.266	0.006	0.086	0.310	0.925	26.441
MNCs	520	5.506	17.630	0.023	0.300	0.902	3.460	94.132
2 Debt Ratio (DR)								
All	1053	0.193	0.196	0.000	0.029	0.138	0.287	0.805
DCs	533	0.201	0.212	0.000	0.011	0.142	0.310	0.829
MNCs	520	0.184	0.179	0.000	0.046	0.136	0.275	0.775
3 Investment Opportunity Set (IOS)								
All	1053	0.016	0.033	0.000	0.000	0.000	0.019	0.146
DCs	533	0.007	0.021	0.000	0.000	0.000	0.000	0.118
MNCs	520	0.026	0.039	0.000	0.000	0.010	0.037	0.161

* Firm Size Total Assets (in billions)

Note: Definition of variables

Debt Ratio (DR) = (Long-Term Debt) / (Market Value of Equity + Long-term Debt),

Investment Opportunity Set (IOS) = R&D Expenses / Total Assets,

Multinationality (MUL) 1. Multinational, positive foreign income tax,

0 Domestic, zero foreign income tax.

Table 2
Pearson Correlation Analysis

	MUL	SIZE	DR	IOS
MUL	1 000			
SIZE	0 330 (0 167)	1 000		
DR	-0 043 (0 167)	0.204 (0.001)	1.000	
IOS	0 294 (0 001)	0 009 (0 579)	-0.214 (0 001)	1 000

* The numbers in parentheses indicate p-value.

The number of observations in this analysis are 1053 sample firms from COMPUSTAT

Note: Definition of variables

Firm Size (SIZE) - Log (Total Assets),

Debt Ratio (DR) = (Long-Term Debt) / (Market Value of Equity + Long-term Debt),

Investment Opportunity Set (IOS) = R&D Expenses / Total Assets,

Multinationality (MUL) = 1 Multinational, positive foreign income tax,

0 Domestic, zero foreign income tax

Table 3
Estimated Coefficients from Logit Models of Inventory Method Choices

	MUL	SIZE	DR	IOS	Overall model p-value	Pseudo R ² **
1	-0.471 (0.001)*				0.002	0.013
2		-0.982 (0.001)	0.315 (0.241)	10.974 (0.001)	0.001	0.111
3	-0.008 (0.480)	-0.933 (0.001)			0.001	0.091
4	-0.256 (0.076)	-0.927 (0.001)	0.279 (0.266)	12.082 (0.001)	0.001	0.113

* The numbers in parentheses indicate p-value.

** Pseudo R-square = $c / (N+c)$ [Aldrich and Nelson (1984)]

where, c the chi-square statistic for overall fit,

N the total sample size

One tailed test for MUL, SIZE, DR, and IOS

Note: Definition of variables

Inventory Valuation Method (INV) = 1: FIFO method,

0: LIFO or mixed method,

Firm Size (SIZE) = Log (Total Assets),

Debt Ratio (DR) = (Long-Term Debt) / (Market Value of Equity + Long-term Debt),

Investment Opportunity Set (IOS) = R&D Expenses / Total Assets,

Multinationalty (MUL) = 1: Multinational, positive foreign income tax,

0: Domestic, zero foreign income tax

Table 4
Estimated Coefficients from Logit Models of Depreciation Method

	MUL	SIZE	DR	IOS	Overall model p-value	Pseudo R ² **
1	-0.364 (0.015)*				0.030	0.005
2		-0.027 (0.398)	0.910 (0.032)	-3.848 (0.044)	0.039	0.008
3	-0.411 (0.011)	0.089 (0.212)			0.068	0.005
4	-0.317 (0.045)	-0.039 (0.366)	0.882 (0.037)	-2.703 (0.128)	0.026	0.011

* The numbers in parentheses indicate p-value

** Pseudo R-square = $c / (N+c)$ [Aldrich and Nelson (1984)]

where, c the chi-square statistic for overall fit,

N the total sample size

One tailed test for MUL, SIZE, DR, and IOS

Note Definition of variables

Depreciation Method (DEP) = 1 Straight Line method,

0 Accelerated or Mixed method,

Firm Size (SIZE) = Log (Total Assets),

Debt Ratio (DR) = (Long-Term Debt) / (Market Value of Equity + Long-term Debt),

Investment Opportunity Set (IOS) = R&D Expenses / Total Assets,

Multinationality (MUL) = 1 Multinational, positive foreign income tax,

0 Domestic, zero foreign income tax

Table 5
Estimated Coefficients from Logit Models of Goodwill Amortization Period

	MUL	SIZE	DR	IOS	Overall model p-value	Pseudo R ² ..
1	-0.833 (0.001)*				0.001	0.040
2		-0.020 (0.439)	0.947 (0.036)	-18.840 (0.001)	0.001	0.058
3	-0.910 (0.001)	0.162 (0.110)			0.001	0.042
4	-0.599 (0.003)	0.978 (0.239)	0.814 (0.063)	-15.346 (0.001)	0.001	0.075

* The numbers in parentheses indicate p-value.

** Pseudo R-square = $c / (N+c)$ [Aldrich and Nelson (1984)]

where, c the chi-square statistic for overall fit,

N the total sample size

One tailed test for MUL, SIZE, DR, and IOS

Note. Definition of variables

Goodwill Amortization Period (GW) = 1: 40 years,

0: Less than 40 years,

Firm Size (SIZE) = Log (Total Assets),

Debt Ratio (DR) = (Long-Term Debt) / (Market Value of Equity + Long-term Debt),

Investment Opportunity Set (IOS) = R&D Expenses / Total Assets,

Multinationality (MUL) - 1: Multinational, positive foreign income tax,

0: Domestic, zero foreign income tax

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