DISCRETIONARY DISCLOSURES OF US AND UK CROSSLISTED FIRMS: IS THERE AN INFORMATION EXPLANATION FOR FORECAST ACCURACY AND DISPERSION?

By

CYNTHIA L. TAYLOR

Bachelor of Science in Accounting
University of Arkansas at Little Rock
Little Rock, AR
1991

Master of Business Administration
University of Arkansas at Little Rock
Little Rock, AR
1993

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Thesis Approved:

Gary Meek

Gary K. Meek

Carol B. Johnson

Carol B. Johnson

Dennis K. Patz

Dennis K. Patz

Charles R Ransom

Charles R. Ransom

Daniel S. Tilley

Daniel S. Tilley

Wayne B. Powell

Dean of the Graduate College

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CHAPTER I

1. INTRODUCTION

The American Institute of Certified Public Accountants (AICPA) and the Institute of Chartered Accountants in England and Wales (ICAEW) issued reports on the future of financial reporting in response to criticisms of the current US and UK reporting models. The AICPA and ICAEW recommend that standard setters develop a model of business reporting to provide the following types of information: (a) forward-looking information, (b) financial and nonfinancial data, and (c) management's analysis of financial and nonfinancial data. Management's analysis of financial and nonfinancial data allows users to develop a model of the firm's operations from management's perspective. Purportedly, management's identification and assessment of reasons for changes in the financial and operating performance of the firm enables users to assess whether past factors or trends will affect the firm's future operating performance; and forward-looking information about the firm's opportunities, risks, and plans enables users to assess where management intends to take the firm in the future.

Under the current financial reporting model, many of these disclosures are provided at management's discretion. Discretionary disclosure research surmises that management's decision to disclose proprietary information rests on the perceived costs and benefits of the disclosure. Firms may benefit from increased disclosure by increasing analyst following, improving analyst forecast accuracy, reducing analyst uncertainty about a firm's future earnings, decreasing firm risk, and ultimately reducing the cost of capital.

In recent years accounting researchers have attempted to link discretionary disclosures with improved user expectations and a reduction in the firm's cost of capital. For example, Botosan (1996), finds that discretionary disclosure reduces the cost of capital for small firms. Lang and Lundholm (1996) find that the "informativeness" of disclosure is related to increased forecast accuracy, as well as reduced risk and uncertainty.[1] Overall, there is limited empirical evidence identifying benefits of discretionary disclosure. This dissertation examines whether discretionary disclosures reduce analysts' forecast errors and reduce the level of disagreement among analysts.

1.1 Research Objective

The purpose of this dissertation is examine whether the level and/or precision of voluntary disclosures across US and UK cross-listed firms is related to forecast error and forecast dispersion. First, voluntary (discretionary) disclosures are compared across US and UK cross-listed firms. *A priori*, US firms may provide less discretionary disclosure, relative to UK firms, because of the rigid, detailed mandatory disclosures in the US [Gray, Radebaugh and Roberts 1990]. On the other hand, US firms may provide more discretionary disclosures, relative to UK firms, because of analysts' greater demand for information in the US [Frost and Pownall 1994]. Thus the first two research questions address whether discretionary disclosures differ across US and UK cross-listed firms.

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[1] The informativeness of firms' disclosures is based on analysts' ratings of the disclosures.

The remaining research questions address whether differences in discretionary disclosures are related to differences in forecast error and dispersion across US and UK cross-listed firms. Prior research indicates that forecast error is significantly different across US and UK firms [Frankel and Lee 1996; Cho 1994]. O'Brien contends that variation in forecast error may be explained by differences in the information disseminated by firms. Differences in forecast error and dispersion across US and UK firms may be due to the level and precision[2] of discretionary disclosures provided by US and UK firms.

In summary, this dissertation extends the discretionary disclosure literature and examines the following research questions: (1) Do US and UK cross-listed firms provide different levels of discretionary disclosure? (2) Do discretionary disclosures by US and UK cross-listed firms differ in their degree of precision? (3) Do differences in the level and precision of voluntary disclosures explain the variation in forecast error and dispersion across US and UK firms?

1.2 Importance of the Problem

Financial analysts specialize in evaluating firm-specific and industry-specific information which enables them to assess firms' future performance. Regardless of its limitations, the primary source of information for analysts' forecasts is the annual report. As noted previously, financial reporting in the US and UK has been the subject of serious criticism. The AICPA and ICAEW reports address the limitations of the

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[2] In this dissertation precision is defined as the extent to which management discloses business decisions and events that affect the item disclosed, as well as the consequences of those business decisions and events allocated over time.

current reporting model, and recommend increased discretionary disclosure as a means of improving financial reporting. Both reports specifically recommend that firms increase the level of disclosure, particularly disclosure of items that indicate the firm's current operating performance and project the firm's future operating performance. Additionally, the AICPA report recommends that firms disclose information about how the items disclosed are derived, particularly management's assessment of the business decisions and events that affect the item disclosed, as well as the consequences of those business decisions and events allocated over time. However, whether these types of disclosures improve analysts' forecasts is an empirical question. If discretionary disclosures explain differences in forecast error across US and UK cross-listed firms, and are related to reduced forecast error and dispersion for these firms, this result provides some empirical support for the AICPA and ICAEW proposition that increased discretionary disclosure reduces forecast error and forecast dispersion.

The next section discusses models of discretionary disclosure presented in the literature. The models are discussed to identify factors that affect the discretionary disclosure decision. Also, prior studies that compare discretionary disclosures by US and UK firms, and studies that compare forecast error across US and UK firms are discussed.

CHAPTER II

2. DISCRETIONARY DISCLOSURE

Research on discretionary disclosure relevant to this dissertation can be classified into three categories:

(1) Positive theories of discretionary disclosure and the relationship between discretionary disclosure and expectations

(2) Descriptive studies of US and UK discretionary disclosure levels and factors that affect a firm's discretionary disclosure policy

(3) Studies of the effects of discretionary disclosure on analysts' expectations

There are many discretionary disclosure models. The main classes of disclosure models are shown in Figure 1. In Figure 1, the first column includes models that present the disclosure decision in terms of the effect of disclosure on traders alone. The second column includes disclosure models that present the disclosure decision in terms of the effect of disclosure on investors, as well as other groups, e.g., analysts, rival firms, or bondholders. The rows of Figure 1 segregate the models based on assumptions about managers' disclosure objectives. For example, the first row refers to models in which managers seek to maximize the total wealth of all shareholders, i.e., the total wealth of current and potential shareholders [Walker 1997].

This dissertation focuses on the relationship between discretionary disclosure and analysts' forecasts. In terms of Figure 1, the disclosure models in category 4, where management's objective is to maximize the total wealth of shareholders, and the interests of third parties are considered in the discretionary disclosure decision, are

relevant to this study. As noted earlier, these models are discussed to identify factors that affect the level and precision of discretionary disclosures. *A priori* expectations about the level and precision of discretionary disclosures across US and UK cross-listed firms and the potential effect of these disclosures are posited based on the discretionary disclosure models discussed in the next section.

2.1. Positive Theories of Discretionary Disclosure and the Relationship between Discretionary Disclosure and Expectations

Verrecchia (1983) contends that when the receipt of information is certain and the level of precision is determined by firms, more precise information implies a lower minimum level of disclosure and a greater probability of disclosure. Verrecchia's model establishes the existence of a discretionary disclosure equilibrium. He posits that the equilibrium level of disclosure depends on the following three conditions: (1) firms seek to maximize their stock price; (2) users make correct conjectures whenever a firm withholds information; and (3) the more information departs from what is expected, the greater the proprietary cost associated with its disclosure. Verrecchia concludes that discretionary disclosure will decrease as the cost of disclosing the information increases.

In essence, Verrecchia finds that the equilibrium level of discretionary disclosure depends on the firm's objective to maximize its stock price, users' speculations about the firms' reasons for withholding information, and the cost of additional disclosure. Thus the equilibrium level of disclosure in all likelihood will differ across US and UK cross-listed firms depending on the firms' objectives and other

equilibrium conditions. Verrecchia's model supports the notion that considerable diversity is expected among firms and across the US and UK firms.

Sankar (1993) focuses on the cost of discretionary disclosure and models the discretionary disclosure decision in a competitive market setting. He suggests that the discretionary disclosure decision is determined by the reaction of rival firms to the information disclosed. In his model the receipt of information is uncertain, such that nondisclosure may be due to the lack of information, rather than the nondisclosure of bad news. Since nondisclosure may be perceived as the result of a lack of information, nondisclosure is discounted less heavily and ultimately firms disclose less valuable or less precise information. This result suggests that the competitive disadvantage of disclosing proprietary data differs across industries and therefore disclosure levels are likely to differ across product markets. Thus discretionary disclosures by US and UK cross-listed firms in different industries may differ because of differences in the level of competition across product markets.

Penno (1996) presents a model of management's disclosure precision choice. He contends that management makes its precision choice to manipulate users' conditional expectations. Similar to this dissertation, Penno defines disclosure precision as the extent to which firms discuss how the amounts disclosed are derived [Penno 1996, p.141]. He finds a unique equilibrium in which firms will provide more precise disclosures if the firm's future prospects are unfavorable, and less precise disclosures if the firm's future prospects are favorable. Given Penno's scenario in which disclosure precision is intended to manipulate users' expectations, the relationship between disclosure precision and analysts' forecast error and dispersion is

ambiguous. This study examines whether more precise discretionary disclosure is related to reduced forecast error and dispersion.

Diamond (1985) provides a model of discretionary disclosure incentives or benefits. Assuming constant absolute risk aversion preferences among users, he contends that the disclosure of proprietary data reduces private information acquisition, and improves risk sharing by reducing the level of dispersion among users' beliefs. He conjectures that when discretionary disclosure is of sufficient quality, the incentive to acquire additional information decreases. A reduction in private information acquisition reduces the disparity in the information sets of users and the level of disagreement among users' beliefs. Therefore, if firms provide information of sufficient quality or precision, analysts may be less likely to seek information from other sources and thereby reduce the disparity among their information sets. Presumably analysts' beliefs are more homogenous when their forecasts are based on similar information sets. Assuming the concept of disclosure precision used in this study represents an element of disclosure quality, this study examines whether increased discretionary disclosure precision is related to reduced forecast dispersion.

In summary, positive disclosure theories identify firm-specific factors that determine the level and precision of discretionary disclosures. Verrecchia (1983) contends that firms' capital market concerns, (i.e., firms' objective to maximize their stock price, users' speculation as to management's motivation for withholding information, and the cost of discretionary disclosure) determine the equilibrium level of discretionary disclosures. The equilibrium level of disclosure implies that the discretionary disclosure choice is jointly determined by the firm's objectives and users

information requirements. Sankar (1993) contends product firms' product market concerns, (i.e., the reaction of rival firms to the information disclosed), determine the level and precision of discretionary disclosures. To the extent that financing and product market concerns differ across the US and UK firms in this study, discretionary disclosure is expected to differ across the two samples.

Based on Diamond (1985), discretionary disclosure precision is expected to reduce forecast dispersion for both the US and UK firms in the study. Differences in dispersion across the US and UK firms may be due to differences in the precision of the discretionary disclosures provided by the US and UK firms. In light of Penno (1996), the relationship between discretionary disclosure and forecast error is ambiguous; and whether discretionary disclosure is related to differences in forecast error across the US and UK is an empirical issue.

2.2 US and UK Discretionary Disclosure

Gray, Meek, and Roberts (1995) describe the voluntary disclosures made by US and UK multinational firms and classify the disclosures into three major categories: (1) strategic, (2) nonfinancial, and (3) financial [GMR 1995]. A voluntary disclosure is defined as a disclosure that is voluntary for both the US and UK firms.

GMR (1995) find that firm size, country/region, and international listing status are dominant factors that explain the variation in voluntary disclosure levels. Furthermore, the importance of the factors varies by information type. Large firms, particularly in the UK, tend to disclose more nonfinancial and financial information. Internationally listed firms tend to disclose more strategic information than firms that

are listed only in their domestic market. Overall, nonfinancial and financial information are the most commonly disclosed information types. Like GRM (1995), this defines discretionary (voluntary) disclosures as disclosures provided beyond those required in both the US and UK; and as suggested by GMR (1995), cross-listed firms, (i.e.,US and UK firms listed in both the US and UK), are examined in this study to control for differences in discretionary disclosures due to listing status.

Frost and Pownall (1994) find that US firms provide significantly more voluntary disclosures (including management forecasts) than UK firms and they posit that the greater analysts' demand for information in the US explains the difference in discretionary disclosures. However, cross-listed US and UK firms must meet the information demands of both US and UK analysts. Therefore it is not clear that Frost and Pownall (1994) results can be attributed to the reason they provide.

Collins, Davie, and Weetman (1993) compare the "quality" of discretionary disclosures across US domiciled firms and UK internationally listed firms. Discretionary disclosures in the *Operating and Financial Review* section of the UK annual report and the *Management Discussion and Analysis* section of the US annual report are examined. Disclosure "quality" is measured as the number of forward-looking disclosures. While they find that UK firms provide higher quality discretionary disclosures than the US firms, the empirical design of CDW (1993) demonstrates the importance of controlling for listing status when comparing discretionary disclosures across countries. Also, information quality as defined by CDW (1993) is fairly narrow. Quality should encompass more than the number of forward-looking disclosures. The disclosure precision measure used in this study may be viewed as an

aspect of disclosure quality. Therefore, the definition of disclosure quality in this study includes both forward-looking discretionary disclosures, along with other types of discretionary disclosures, and the precision of these disclosures.

2.3 Analysts' Forecasts and Information

There has been little empirical research that relates the quality of discretionary disclosure to analysts' expectations. Lang and Lundholm (1996) use data from the *Report of the Financial Analysts Federation Corporate Information Committee (FAF Report 1985-89)*, and its measure of disclosure informativeness to examine the relationship between disclosure informativeness and analyst following, forecast accuracy, and volatility in forecast revisions. The FAF measures informativeness as "the extent to which the firm provides information so that investors have the information necessary to make informed judgements." Lang and Lundholm (1996) use analysts' ratings of disclosures as a measure of informativeness. However, they provide no insight as to the criteria analysts use to evaluate the disclosures. Lang and Lundholm (1996) conclude that US firms with more informative disclosure policies have a larger analyst following, more accurate analysts' earnings forecasts, less dispersion among individual analysts' forecasts, and less volatility in forecast revisions. Given the notion that disclosure precision, as defined in this study, represents an element of disclosure informativeness, this study examines whether disclosure precision is related to differences in forecast error and dispersion across the US and UK cross-listed firms included in the sample.

Cho (1994) compares forecast error across US and UK domiciled firms. Using the number of analysts following the firm as a proxy for information availability, Cho finds that the source of variation in forecast error across US and UK firms is information availability. As information about UK firms increases, forecast errors for UK firms decreases. However, information availability is not related to forecast errors of US firms. This result may suggest that the analyst following is an inadequate proxy for information availability in the US. This result may also suggest that information disseminated by US and UK firms differs, and/or that the relationship between information and forecast errors may be different across US and UK firms. This dissertation addresses whether differences in discretionary disclosures explain differences in forecast error and dispersion across US and UK cross-listed firms.

In summary, prior studies examine and compare the level of discretionary disclosures across US and UK firms, and identify factors that affect the variation in discretionary disclosure among and across US and UK firms. Few studies examine the relative quality of discretionary disclosure between the US and UK. This dissertation measures and compares the level and precision of discretionary disclosures provided by US and UK cross-listed firms, and examines the relationship between discretionary disclosure and analysts' forecast error (dispersion).

The next section presents a model of factors that affect forecast error and dispersion. The factors included in the model have been identified in the literature as determinants of forecast error and dispersion.

CHAPTER III

3. FORECASTING FRAMEWORK

Chapter III presents a discussion of firm-specific factors and macroeconomic factors that may affect forecast error and dispersion. The objective of this analysis is to present a model of factors that may affect analysts' forecasts, and ultimately affect analysts' forecast error and dispersion. The last section presents a functional model of forecast error and dispersion.

3.1 Firm-Specific Factors

Studies that examine forecast error and dispersion consistently find that firm size is negatively related to forecast error and dispersion [Brown et. al (1987); Cho (1994); Bhushan (1989)]. As stated previously, Cho (1994) compares the determinants of forecast error across US and UK firms. For both the US and UK samples, firm size is negatively related to forecast error. Analysts may focus on larger firms because they are more widely held and stimulate the interest of a large number of investors, and ultimatley result in more business transactions for the analysts [Bhushan 1989].

Forecast error may also be affected by the volatility in firms' earnings streams. Kross, Ro, and Schroeder (1990) find that earnings volatility is positively correlated with forecast error. Varying levels of competition and risk among industries suggest differences in earnings predictability across firms in different industries. For example, the earnings of regulated industries may be less volatile and therefore more predictable [Cho 1994]. Furthermore, there may be important industry differences across firms in

terms of the demand for analysts' services. For example, information acquisition costs may differ by industry, implying that, ceteris paribus, there will be differences in the number of analysts forecasting in different industries, and ultimately differences in forecast error and dispersion [Bhushan 1989].

Brown, Foster, and Noreen (1985) compare forecast error across forecast horizons. They find that the forecast horizon, (i.e., the length of time between the date the forecast is made and the fiscal year end), affects forecast error and dispersion. The intuition is that more information becomes available as fiscal year end approaches. Consequently, forecast error and dispersion decrease over time.

Additionally, forecast error may differ across firms from different domiciles because of accounting measurement techniques used to compute earnings. Prior research suggests that firms use accounting techniques to "smooth" earnings and thereby reduce perceived risk and the volatility in their stock prices. Appendix A summarizes significant differences in US and UK GAAP measurement techniques, with the relative impact of the techniques on earnings expressed in terms of conservatism. Most of the GAAP differences result in more conservative earnings figures under US GAAP. Also, for each of the differences between US and UK GAAP, UK GAAP allows more flexibility in the application of the accounting rules [Radebaugh and Gray 1993]. For example, US accounting rules for the amortization of goodwill tend to be more restrictive than those in the UK. In particular, goodwill is capitalized and amortized over a period not to exceed 40 years in the US. In the UK, firms may capitalize and amortize goodwill over its economic useful life, but there is no maximum

period of amortization. Alternatively, UK firms may write-off goodwill to equity in the year of acquisition [Radebaugh and Gray 1993].

Unanticipated changes in economic activity may affect analyst forecast error and dispersion [O'Brien 1988]. The next section discusses economic factors used in analyst forecast models to predict earnings.

3.2 Macroeconomic Factors

The macroeconomic factors used to predict earnings include gross national product (GNP), inflation, and exchange rates [Herrmann 1996]. Expectations of these factors are used to predict the firm's future profitability in light of the firm's economic environment.

3.2.1 *Gross National Product*

Gross National Product (GNP) in the US and Gross Domestic Product (GDP) in the UK represent the market value of the aggregate production of new goods and services [Smith 1985]. Expectations of changes in national economic growth are presumed to be directly correlated with changes in firm profitability. Presumably analysts use the expected growth in the national economy as an indicator of future earnings growth of firms within the economy.

3.2.2 *Inflation*

Inflation reflects changes in the price of goods and services. In the long run, price changes are due to shifts in the country's aggregate demand and supply curves caused by monetary policy, fiscal policy, or private acquisitions. In the short run,

prices are set in individual markets by contracts, regulatory authorities, and pricing formulas. For example, from these pricing formulas, firms determine their average costs at normal production levels and set product prices to earn a target profit. Ultimately, economic fluctuations, e.g., changes in demand and supply conditions, affect firms' profits through changes in the costs of wages and other expenses.

3.2.3 *Exchange Rates*

Exchange rates determine the domestic price of foreign goods. Inflation in one country depreciates its currency relative to another country's currency, *ceteris paribus*. Smith (1985) states that exchange rates adjust to maintain purchasing power parity across countries. In other words, exchange rates change such that the price of a foreign item will equal the domestic price of a comparable domestic item. If purchasing power parity holds, changes in exchange rates are negatively correlated with changes in inflation. Empirical research indicates that purchasing power parity does not hold in the short-run. Therefore forecast models of one-year-ahead earnings should include both expected changes in exchange rates and inflation [Abuaf and Jorion 1990].

Balakrishnan, Harris, and Sen (1990) and Herrmann (1996) describe the accuracy of earnings expectations as a function of changes in the aforementioned macroeconomic factors. The model is described as follows

$$E\left[Y_{t+1}\right] = Y_t\left(1+E\left[\Delta FX_{t+1}\right]\right)\left(1+E\left[\Delta INF_{t+1}\right]\right)\left(1+E\left[\Delta GNP_{t+1}\right]\right) \qquad (1)$$

where

$E\left[Y_{t+1}\right]$ = the expected amount of earnings in period $t + 1$.

Y_{t+1} = the actual earnings in period t.

$E\left[\Delta FX_{t+1}\right]$ = the expected change in the effective exchange rate in period $t + 1$.

$E\left[\Delta INF_{t+1}\right]$ = the expected change in inflation in period $t + 1$.

$E\left[\Delta GNP_{t+1}\right]$ = the expected change in real GNP in period $t + 1$.

The model depicts the main effects of each economic factor and interactions between the factors. Presumably, errors in expected economic changes will result in larger earnings forecast errors.

O'Brien (1988) models forecast error as a combination of average error across firms and across time periods. Forecast error is described below as

$$\left|FE_{j,t}\right| = \delta_{1,j} + \delta_{2,j} + \varepsilon_{j,t} \qquad (2)$$

where

$\delta_{1,j}$ = average error across years for each firm j.

$\delta_{2,t}$ = average error across firms for each year t

$\varepsilon_{j,t}$ = deviations from the average error for firm j and for year t

In this study, forecast error is computed across firms and time periods. Firm-specific factors, particularly the level of discretionary disclosure, may result in differences in forecast error and dispersion across firms and countries.

3.4 Forecasting Models

The preceding paragraphs discuss predictive factors used to forecast earnings, and factors that affect forecast error and dispersion. Based on these factors, a structural model of analysts' forecast error and dispersion is described as:

$$FE_{j,t} = f(VDS_{j,t-1}, PVDS_{j,t-1}, Size_{j,t}, Ind_{j,t}, Earn_{j,t}, Hor_{j,t-i}, Country_j, E[\Delta GNP_t], E[\Delta FX_t], E[\Delta INF_t]) \quad (3)$$

$$CV_{j,t} = f(VDS_{j,t-1}, PVDS_{j,t-1}, Size_{j,t}, Ind_{j,t}, Earn_{j,t}, Hor_{j,t-i}\ Country_j, E[\Delta GNP_t], E[\Delta FX_t], E[\Delta INF_t]) \quad (4)$$

where:

$FE_{j,t}$ = $|F_{j,t} - A_{j,t}|/|A_{j,t}|$, where $A_{j,t}$ is actual earnings per share for firm j, for period t and $F_{j,t}$ is forecast earnings per share for firm j in period t

$CV_{j,t}$ = forecast dispersion for firm j in period t

VDS_{t-1} = disclosure level score for firm in period t-1

$PVDS_{t-1}$ = the disclosure precision score for firm j in period t-1

$Size_{j,t}$ = market equity (shares * price for firm j in period)

$Ind_{j,t}$ = industry classification for firm j in period t

$Earn_{j,t}$ = historical earnings stability for firm j, over period t-1 to t-5

$Hor_{j,t-i}$ = forecast horizon, i.e., $t - i$ months prior to fiscal year end

$Country_j$ = 1 if US cross-listed firm, 0 if UK cross-listed firm

$E[\Delta GNP_t]$ = the expected change in real GNP in period $t + 1$

$E[\Delta FX_t]$ = the expected change in the effective exchange rate in period $t + 1$

$E[\Delta INF_t]$ = the expected change in inflation in period $t + 1$

CHAPTER IV

4. STATEMENT OF HYPOTHESES

4.1 Hypothesis 1: Discretionary disclosure levels across US and UK cross-listed firms

The first research question addresses whether US and UK cross-listed firms provide different levels of discretionary disclosures. As noted in Meek, Gray, and Roberts (1995), country of origin, which may indicate the influence of domestic mandatory disclosures on firms' discretionary disclosure strategies, explains some of the variation in discretionary disclosures by US and UK firms. Gray, Radebaugh, and Roberts (1990) contend that US firms will provide less information voluntarily than UK firms because of the extensive regulatory disclosure requirements in the US. However, Frost, and Pownall (1994) note that US firms provide more discretionary disclosures to meet US analysts' greater demand for information. In this study, cross-listed firms are examined to control for the effect of international listing status on the level of discretionary disclosure [Gray, Meek, and Roberts 1995]. The demand for information should be similar for these firms.

Based on this discussion, the first hypothesis addresses whether the level of discretionary disclosure differs across US and UK cross-listed firms. The first hypothesis is stated below in the null and alternative forms.

$H1_0$: The level of discretionary disclosure is equal across US and UK cross-listed firms.

$H1_A$: The level of discretionary disclosure is not equal across US and UK cross-listed firms.

4.2 Hypothesis 2: Discretionary disclosure precision across US and UK cross-listed firms

Discretionary disclosure theory contends that the precision of discretionary disclosure is a function of product market and capital market concerns. Firms that operate in highly competitive industries are less likely to disclose high quality proprietary information voluntarily than firms that do not face similar competitive pressures [Sankar 1993; Bhushan 1989]. Also, firms seeking to obtain new capital are more likely to disclose additional information voluntarily than firms that do not have immediate capital concerns [Lang and Lundholm 1993]. Thus differences in the precision of discretionary disclosures by US and UK firms represented in this study may be due to differences in product market concerns since they are concentrated in different industries, facing different competitive pressures.[3] The extent to which capital market pressures are different across the US and UK will affect the precision of the sample firms' discretionary disclosures.

The second research question addresses whether discretionary disclosure precision differs across US and UK cross-listed firms. The second hypothesis is stated below in the null and alternative forms.

$H2_0$: The precision of discretionary disclosure is equal across US and UK cross-listed firms.

$H2_A$: The precision of discretionary disclosure is not equal across US and UK cross-listed firms.

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[3] Table 2, discussed in Chapter V, shows the industry representation of the sampled US and UK firms.

4.3 Hypothesis 3: Discretionary Disclosure and Forecast Accuracy across US and UK firms

Frankel and Lee (1997) compare forecast error across countries and find significant differences in forecast error across US and UK firms. Cho (1994) compares the determinants of forecast error across US and UK firms and finds significant differences after controlling for firm size and industry effects. The difference in forecast error across the US and UK firms is attributed to the number of analysts following the firms. Since analyst following is a function of information availability,[4] this result suggests that differences in forecast error across the US and UK may be due, at least in part, to the level and quality of discretionary information disclosed by US and UK firms.

The third research question addresses whether differences in forecast error across US and UK cross-listed firms is due to differences in the level and precision of discretionary disclosure. The third hypothesis is stated below in the null and alternative forms:

$H3_0$: The level and/or precision of discretionary disclosure is not related to differences in forecast error across US and UK cross-listed firms.

$H3_A$: The level and/or precision of discretionary disclosure is related to forecast error across US and UK cross-listed firms.

4.4 Hypothesis 4: Discretionary Disclosure and Forecast Dispersion

Diamond (1985) presents an economic model of the benefits of discretionary disclosure. He posits that increased discretionary disclosure reduces the level of private

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[4] Bhushan 1989 examines the determinants of the number of analysts following a firm. Firm size, ownership structure, and information are related to the number of analysts following a firm.

information acquisition and reduces dispersion among users' beliefs. Similarly, Barry and Brown (1985) support the notion that beliefs among analysts tend to converge as the level of public information increases. Blackwell and Dubins (1962) statistically demonstrate that as individuals obtain finite information items, each individual has a basis for better probability beliefs and the variation of their beliefs decreases. If discretionary disclosures differ across the US and UK cross-listed firms in this study, assuming all other factors are constant, differences in forecast dispersion across the US and UK firms may be related to differences in discretionary disclosures.

The fourth research question addresses whether discretionary disclosure is related to differences in forecast dispersion across the US and UK cross-listed firms. The fourth hypothesis is stated below in the null and alternative forms.

$H4_0$: The level and/or precision of discretionary disclosures by US and UK cross-listed firms is not related to the difference in forecast dispersion across US and UK cross-listed firms.

$H4_A$: The level and/or precision of discretionary disclosures by US and UK cross-listed firms is related to differences in forecast dispersion across US and UK cross-listed firms.

CHAPTER V

5. RESEARCH DESIGN

5.1 Data

The data collection begins with a list of cross-listed firms from the *1994 International Stock Exchange*. Earnings forecasts are obtained from the *Institutional Brokers Estimate System* (I/B/E/S). Firms included in the sample meet the following data constraints:

(1) The firms are listed on both the International Stock Exchange and either the American Stock Exchange or the New York Stock Exchange.

(2) Actual earnings figures are available on I/B/E/S to ensure consistency and comparability in the earnings per share figures used to compute forecast error and dispersion. Also, earnings forecast data and five year earnings stability data are available on I/B/E/S.

(3) Annual report data is available for 1993 and/or 1995 to measure the level and precision of discretionary disclosure across firms and years.

(4) No financial institutions are included in the sample because of the specialized financial reporting for financial institutions.

(5) No stock splits occurred between 1993 and 1995 to limit the number of adjustments to the I/B/E/S forecast data.

Table 1 presents the number of firms included in the sample.

5.2 Discretionary Disclosure Index

The first two research questions address whether discretionary disclosures provided by US and UK cross-listed firms are significantly different. A disclosure index based on the AICPA and ICAEW recommendations, Meek, Gray, and Roberts (1995) and Botosan (1997) is developed to measure the level of discretionary disclosure

across US and UK firms. The disclosures are divided into four categories: (1) background information, (2) financial and nonfinancial data, (3) information in the management discussion and analysis section, and (4) forward-looking information. Appendix B contains the disclosure index. A precision index, which is discussed later, is developed to measure disclosure precision.

5.2.1 *Background Information*

Background information includes broad company objectives and strategies, a description of the business and properties, and the impact of the industry structure on the company. Management objectives and strategies provide a forward-looking perspective about where management intends to take the company in the future. Given this information, analysts can assess the firm's ability to meet its objectives and evaluate the firm's strategy. The scope and description of business and properties, particularly changes in the business and properties, enable analysts to maintain a current mental image of the company's current operations and future prospects. Information about the impact of industry structure addresses new products or services that affect the market served by the business. For example, information about technological and regulatory changes that may affect a firm's market and information about the intensity of competition in an industry is useful to analysts. Analysts may use this information to evaluate opportunities and risks and the impact of these opportunities and risks on a firm's operating performance.

5.2.2 *Financial and Nonfinancial Data*

The AICPA's report notes that users are as interested in a firm's business activities, processes, and events that affect the firm, as they are interested in its financial measures. Operating data allows analysts to model company revenues and costs both in operating terms, e.g., units sold, key resources consumed, number of employees, and employee wages, as well as in financial terms. Operating performance measurements and disclosures that relate to the quality of products or services, the relative cost of activities, and the time required to develop new products are useful indicators of a firm's current performance and future earnings potential.

5.2.3 *Management Discussion and Analysis*

The US *Management Discussion and Analysis*, and the UK *Operating and Financial Review* are intended to convey year-to-year changes in the firm's financial performance, not covered in the basic financial statements. SEC Act Release No. 6231 requires "a discussion of liquidity, capital resources, results of operations, and other information necessary to an understanding of a registrant's financial condition and results of operations" [FRR-36, p.1577 1989]. Since the SEC guidelines do not explicitly require quantitative disclosures, such disclosures are included in both the discretionary disclosure level measure and the precision measure.

5.2.4 *Forward-looking Information*

Forward-looking information includes information about opportunities and risks, and management's plans for the future. Industry conditions, threats from substitute products or services, and changes in the competitive environment represent

opportunities and risks. Management's plans for the future include key assumptions about factors or conditions that are critical for management's plans to be successful. Analysts use this information to assess the validity of the firm's projections and the likelihood the firm will achieve its objectives.

5.3 Measuring Discretionary Disclosure

Two measures of disclosure are developed: (1) a measure of the level of discretionary disclosure in the annual report, and (2) a measure of the precision of discretionary disclosure in the annual report. Using dichotomous scoring, summing the total number of points awarded to firm *j* across all 68 items in the index produces a measure of disclosure level (*VDS*) for each firm for period *t*. Operationally, disclosure level is computed as:

$$VDS_{j,t}=\sum_{i=1}^{n=68} SCORE_{i,j,t} \tag{5}$$

The second measure of voluntary disclosure augments the level measure by incorporating the concept of precision. Disclosure precision (*PVDS*) is defined as follows: (1) the extent to which the item disclosed is quantified; (2) the extent to which business decisions and events that affect the item disclosed are discussed and quantified; and (3) the extent to which the consequences of the business decisions and events that affect the item disclosed are discussed, quantified, and allocated over time. Specifically, the precision score is intended to measure the extent to which firms do the following: (1) quantify the item disclosed, i.e., provide a range of values or point estimate; (2) disclose the change in the item disclosed; (3) discuss reasons for the item

disclosed; (4) quantify reasons for the item disclosed; (5) discuss transitory and/or permanent effects of the item disclosed; and (6) quantify transitory and/or permanent effects of the item disclosed. Each of the 68 items in the discretionary disclosure index is evaluated based on the criteria in the precision index and awarded a precision score. For example, a maximum of one points is awarded if the firm quantifies the item disclosed, i.e., one-half point is awarded for disclosing range estimates and one point is awarded for disclosing point estimates. One point each is awarded for: disclosure of the change in the item disclosed, discussion of the reasons for the item disclosed, quantification of reasons for the item disclosed, discussion of the transitory or permanent effects of the item disclosed, and quantification of the transitory or permanent effects of the item disclosed. Appendix C lists the items in the precision index. Total precision is computed as:

$$PVDS_{j,t}=\sum_{i=1}^{68} PSCORE_{i,j,t} \qquad (6)$$

Where (PVDS) is the precision score for firm j for period t.

The following example is provided to illustrate the scoring procedure. Philip Morris's 1995 annual report discusses the firm's projected capital expenditures for 1996 as follows:

> "Capital expenditures are estimated to be $1.8 billion in 1996 and a total of approximately $8.0 billion for the five-year period 1996-2000, of which approximately 41% and 46%, respectively, are projected for food operations and approximately 53% and 44%, respectively, are projected for tobacco operations." [Philip Morris 1995, p.24]

The capital expenditure forecast is awarded a precision score of 3 out of 6. One point is awarded for the *point estimate*; one point is awarded for disclosing the *reason* for the

business decisions that affect the capital expenditure forecast, i.e., expenditures for food and tobacco operations; and one point is awarded for the *quantification* of the reasons for the business decisions that affect the capital expenditure, i.e., 41% and 53% are projected for food operations and tobacco operations. (The five year expenditure forecast is not included in the precision score because this study focuses on one-year-ahead forecasts). Since Philip Morris does not disclose changes in capital expenditures nor discuss or quantify transitory or permanent affects on capital expenditures, no points are for them.

5.4 Comparing Discretionary Disclosure Across US and UK Cross-listed Firms

The first two research questions address whether discretionary disclosures differ across US and UK firms. To test hypotheses one and two, discretionary disclosure data are collected from the annual reports of US and UK cross-listed firms. In total, 97 US annual reports and 96 UK annual reports are analyzed. The US and UK samples each include 71 firms. The disclosure measures are based on annual report data for the years 1993, 1995, or both. Prior research on disclosure levels use disclosure ranks rather than the actual scores because of violations of normality and ambiguity associated with the measurement scale of the disclosure scores. To achieve an interval scale of measurement, the disclosure items are assumed to be equally weighted, i.e., the items are equally important to analysts' forecasts. Also, normality tests of the disclosure scores indicate that the scores are normally distributed. Therefore, actual scores and parametric t-tests are used to test for mean differences in disclosure between the US and the UK firms in the sample.

5.5 Testing the Relationship between Discretionary Disclosure Forecast Error

The third research question addresses whether forecast error across US and UK cross-listed firms is related to the level and/or precision of discretionary disclosures. Firm-specific factors, (i.e., earnings stability, firm size and industry classification) are included in the model to control for their affects on forecast error [O'Brien 1988; Brown et. al 1987; Cho 1994; Kross, Ro, and Schroeder 1990].

Earnings stability is measured as the mean absolute percentage difference between actual reported earnings per share and a five-year historical earnings per share growth trend line, expressed as a percentage of the trend line EPS. Earnings stability is expected to be positively correlated with forecast error and forecast dispersion. I/B/E/S calculates earnings stability as follows:

$$Stability_{j,t} = \sum_{t=1}^{n} \left| Earnings(x_t) - Trend(x_t) \right| \div \left| Trend(x_t) \right| \div 5 \qquad (7)$$

where

Earnings (x_t)	=	actual earnings for firm *j* in period *t*
Trend (x_t)	=	earnings trend line, $a*e^{b*x}$, i.e., the slope of a least squares curve fit to the logarithm of the reported earnings

Earnings stability measures the uniformity of earnings per share growth for firm *j* over the past five years. The lower the number, the more uniform earnings growth has been. This measure of earnings stability is taken from the I/B/E/S forecast data. Earnings stability is used in this dissertation to control for the variation in forecast error and dispersion among firms that can be attributed to the volatility of the earnings

stream. Also, earnings stability is used to proxy for differences in US and UK GAAP measurement practices when comparing forecast error and dispersion across the US and UK firms in the sample.

Market capitalization is used as a measure of firm size. Market capitalization represents the total value of the firm's outstanding equity. Market capitalization for the UK firms is translated into US dollars using the exchange rate corresponding to the time of the price data. Firm size is expected to be negatively related to forecast error and dispersion.

Industry classifications are based on I/B/E/S sector codes. The firms are grouped into 11 industries. Table 2 presents the industry sectors included in the sample.

Research discussed in Chapter III indicates that analysts consider macroeconomic forecasts in developing their earnings forecasts. These factors should be included as control variables in models of forecast error and dispersion. However, it is not possible to include all of the economic predictor variables because the forecast models are estimated using two years of data. At least four years of data are required to estimate the model with three economic predictor variables.

To assess the implications of this data constraint for this particular study, the relationship between expected changes and actual changes in the economic factors and actual earnings changes is examined. Appendix D describes the procedure used to analyze these relationships. The results indicate that actual and expected changes in economic factors are not related to earnings changes for the data used in this study.

The following general linear model is used to test the effect of discretionary disclosure on forecast error across US and UK cross-listed firms.

$$\ln FE_{j,t} = a_0 + \beta_1 VDS_{j,t-1} + {}_2PVDS_{j,t-1} + {}_3\ln Earn_{j,t} + \beta_4 \ln Size_{j,t} + \beta_5 Country_j + \sum_{i=1}^{11} \delta_i Ind_{i,j,t} + \sum_{i=0}^{-11} \gamma_i Hor_{i,j,t} +$$
$$\beta_6 Year_t + \beta_7 Country_j * VDS_{j,t-1} + \beta_8 Country_j * PVDS_{j,t-1} + \beta_9 Country_j * \ln Earn_{j,t} + \quad (8)$$
$$\beta_{10} Country_j * \ln Size_{j,t} + \beta_{11} Country_j * \sum_{i=1}^{11} \delta_i Ind_{i,j,t} + \beta_{12} Country_j * \sum_{i=0}^{-11} \gamma_i Hor_{i,j,t} + \beta_{13} Country_j * Year_t + \varepsilon$$

where:

$FE_{j,t}$	=	Forecast Error, $\lvert F_{j,t} - A_{j,t} \rvert / \lvert A_{j,t} \rvert$, where $A_{j,t}$ is actual earnings per share for firm j, for period t and $F_{j,t}$ is forecast earnings per share for firm j in period t.
$A_{j,t}$	=	actual earnings per share for firm j in period t
$F_{j,t}$	=	mean analyst forecast of period t earnings per share for firm j
$VDS_{j,t-1}$	=	the disclosure level score for firm j in period t-1
$PVDS_{j,t-1}$	=	the disclosure precision score for firm j in period t-1
$Earn_{j,t-i}$	=	historical earnings stability for firm j, over period t-1 to t-5
$Size_{j,t}$	=	market capitalization, i.e., shares outstanding * Price for firm j in period t
$Country_j$	=	indicator variable, i.e., 0 if UK cross-listed firm, 1 if US cross-listed firm
$Ind_{i,j,t}$	=	industry classification for firm j in period t representing industry category i, i=1,...,1
$Hor_{i,j,t}$	=	indicator variable for firm j in period t, representing month i, i=0,...,-11, i.e., the number of months the forecast is made prior to the fiscal year end
$Year_t$	=	indicator variable, i.e., 0 if 1993, 1 if 1995

Forecast error is computed using actual earnings per share and expected earnings per share data from I/B/E/S.[5]

Forecast error is measured as the absolute percentage difference in forecasted earnings per share for period *t* and actual earnings per share in period *t*. Evidence of whether differences in discretionary disclosure level and precision explain differences in forecast error across the US and UK firms is found by noting the significance of the estimated slope parameters in Equation (8). The standard F-test is used to test the significance of the relationship between forecast error and discretionary disclosure for the US and UK firms. If the estimated coefficients on $Country_j$ * $VDS_{j,t-1}$ and $Country_j$ * $PVDS_{j,t-1}$ are significant, then the level and precision of discretionary disclosure explain differences in forecast error across the US and UK firms in the sample and null hypothesis three is rejected in favor of the alternative hypothesis. Discretionary disclosure is expected to be negatively related to forecast error (i.e., forecast error decreases as the level and precision of discretionary disclosure increases).

5.6 Testing the Relationship between Discretionary Disclosure and Forecast Dispersion

The fourth research question addresses whether variation in forecast dispersion across US and UK cross-listed firms is related to discretionary disclosures provided by US and UK cross-listed firms. Forecast dispersion is used as a measure of the level of

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[5] EPS data are based on operating income divided by the weighted average number of common shares outstanding. To preserve the historical relationship between analysts' forecasts and reported earnings, no adjustments are made for restatement of earnings from a prior period.

disagreement among analysts' forecasts. Again, firm-specific factors that affect forecast dispersion are included in the forecast dispersion model.

The level of disagreement among analysts is measured by the mean absolute coefficient of variation. The coefficient of variation (*CV*) is defined as the absolute value of the standard deviation of the estimates expressed as a percent of the mean estimate. *CV* measures the relative dispersion of forecasts around the consensus estimate. A low *CV* indicates a high level of agreement among analysts. Conversely, a high *CV* indicates that analysts disagree on the firm's future. The *CV* is calculated as follows:

$$CV_{j,t} = \left| \sigma_{FE_{j,t}} / \mu_{FE_{j,t}} \right| * 100 \tag{9}$$

where

$CV_{j,t}$ = coefficient of variation for firm j in period t

$\sigma_{FE_{j,t}}$ = 12 month forward standard deviation for firm j in period t

$\mu_{FE_{j,t}}$ = 12 month forward mean for firm j in period t

CV is computed from I/B/E/S data. This measure of differing beliefs (*CV*) is used extensively in the literature as a proxy for forecast uncertainty.[6] The general linear model used to test for differences across US and UK firms is described below.

$$\begin{aligned} \ln CV_{j,t} = {} & \alpha_0 + \beta_1 VDS_{j,t-1} + \beta_2 PVDS_{j,t-1} + \beta_3 \ln Earn_{j,t} + \beta_4 \ln Size_{j,t} + \beta_5 Country + \sum_{i=1}^{11} \delta_i Ind_{i,j,t} + \sum_{i=0}^{-11} \gamma_i Hor_{i,j,t} + \\ & \beta_6 Year + \beta_7 Country*VDS_{j,t-1} + \beta_8 Country*PVDS_{j,t-1} + \beta_9 Country*\ln Earn_{j,t} + \beta_{10} Country*\ln Size_{j,t} \\ & \beta_{11} Country*\sum_{i=1}^{11} \delta_i Ind_{j,t} + \beta_{12} Country*\sum_{i=0}^{-11} \gamma_i Hor_{j,t} + \beta_{13} Country*Year + \varepsilon \end{aligned} \tag{10}$$

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[6] For example, Daley, Senkow, and Vigeland [1988]; Ajinkya, Atiase, and Gift [1991]; and Elliott, Philbrick, and Wiedman [1995]

where:

$CV_{j,t}$ = coefficient of variation for firm j in period t

and all other variables are as previously defined.

Evidence of whether discretionary disclosure level and precision is related to variation in forecast dispersion across the US and UK firms is found by noting the significance of the estimated slope parameters in equation (10). The standard F-test is used to test the whether forecast dispersion across US and UK cross-listed firms is related to discretionary disclosures provided by US and UK firms cross-listed firms. If the estimated coefficients on $Country_j * VDS_{j,t-1}$ and $Country_j * PVDS_{j,t-1}$ are significant, then the level and precision of discretionary disclosure explain differences in forecast dispersion across the US and UK firms in the sample, and null hypothesis four is rejected in favor of the alternative hypothesis. Discretionary disclosure is expected to be negatively related to forecast dispersion, i.e., the level of disagreement among analysts decreases as the level and precision of discretionary disclosure increases.

CHAPTER VI

6. EMPIRICAL RESULTS

6.1 Test of Hypotheses 1 and 2: Differences in Discretionary Disclosure

The first two research questions address whether discretionary disclosure differs across US and UK cross-listed firms. Table 3 presents the means and standard deviations of the disclosure scores for the US firms and the UK firms. Both the level and precision of discretionary disclosure by UK firms are significantly less than US firms at the $\alpha = .000$ level. Table 4 presents the mean and standard deviation of the disclosure scores for the years 1993 and 1995. The test of mean differences in disclosure for the years 1993 and 1995 indicate significant differences across the years, with increased disclosure in 1995 compared to 1993 for both the US and UK firms in the sample.

6.2 Descriptive Statistics

The correlation matrices for the independent variables used in the US and UK forecast error models are shown in Tables 5 and 6, respectively. Disclosure level (VDS) and disclosure precision (PVDS) are highly correlated at .843 ($\alpha = .000$) for the US data and at .641 ($\alpha = .000$) for the UK data. Most of the other correlations are less than .20 and significant at the .000 level. Tables 7 and 8 present the correlation statistics for the forecast dispersion models. The results are similar to the forecast error model results, with disclosure level positively correlated to disclosure precision.

6.2.1 *Diagnostics*

Equations (8) and (10) presented in Chapter V are used to estimate the parameters and test hypotheses 3 and 4. Standard tests of the normality of the error terms using the untransformed variables indicated violation of the normality assumption; therefore, the logarithmic transformation of the dependent variables and two of the independent variables (Size and Earnings Stability) is chosen. Standard tests of normality with the transformed variables failed to reject the normality assumption.

As a result of the high correlation between the disclosure measures, multicollinearity diagnostics are performed. Variance inflation factors of less than 5 indicate that multicollinearity is not a significant problem. To further support including both disclosure measures in the model, the models are tested for parameter stability, i.e., the models are run separately, each including only one of the disclosure measures. The estimated coefficients when the model is estimated with one of the disclosure variables are the same as when both variables are included in the model. Consequently, the model does not exhibit significant multicollinearity among the independent variables.

Studentized residuals are used to identify outliers in the dependent variables. The models are tested with and without the outliers. No significant differences in the results are noted. The disclosure variables are also examined for potential outliers. The models are tested with and without the five most extreme values of the disclosure variables for both the US and UK samples. There are no significant differences in the model results with and without the extreme observations. The model results reported in

this study are based on models that include all of the discretionary disclosure observations.

6.3 Test of Hypothesis 3: Discretionary Disclosure and Forecast Error

The third research question addresses whether discretionary disclosure is related to differences in forecast error across the US and UK cross-listed firms. Equation (8) is estimated using ordinary least squares regression to determine whether discretionary disclosures explain differences in forecast error across US and UK cross-listed firms. Table 9 presents the results for the model. The overall model is significant, with an Adjusted R-square of .328. Partial F-tests to check the significance of the control variables produced significant F-statistics for country, industry, forecast horizon, and firm size. These result indicate that these variables add to the explanatory power of the model. The significant F-statistic on the Country indicator variable indicates that mean forecast error across the US and UK firms is significantly different.

Hypothesis 3 is tested by noting the significance of the estimated coefficients on $Country_j * VDS_{j,t-1}$ and $Country_j * PVDS_{j,t-1}$. The variables produced F-statistics of 14.911 and 41.036, both significant at the $\leq$ .05 level of significance. These results indicate that the level and precision of discretionary disclosures explain differences in forecast error for the US and UK cross-listed firms, with the estimated effect of discretionary disclosures greater for the US firms. Therefore, null hypothesis 3 is rejected in favor of the alternative hypothesis.[7]

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[7] Joint tests of parameter stability, independence, and functional form indicate that the parameters are stable and the double-log model is an appropriate functional form.

Table 10 presents the estimated coefficients for the US and UK forecast error model. The results indicate that forecast error for UK cross-listed firms, assuming all other factors are constant, is 1.069 smaller than the forecast error for the US cross-listed firms. Consistent with prior research, mean forecast error decreases as the forecast horizon decreases. Specifically, mean forecast error is significantly larger for forecasts made eleven to four months prior to the firm's fiscal year end, relative to the mean forecast error of forecasts made the month of the firm's fiscal year end.

For the industries represented in the study, the effect of industry classification on mean forecast error is different across the US and UK. The significant estimated coefficients on the interaction between the Country and Industry categorical variables indicates that the effect of industry classification on mean forecast error is different across the US and UK. This result may be due to differences in the number of analysts following particular industries across the US and UK. However, analyst following may not differ significantly across internationally listed firms. Perhaps differences in the economic environment across the US and UK contribute to differences in the industry affects across the two countries. That is, the operating environments of the industries may contribute to differences in earnings volatility. More stable economic environments, despite the number of analysts following the firm and the nature of competition in the industry, may result in less volatile earnings streams.

The estimated effect of discretionary disclosure level on forecast error in the US is given by the coefficient on VDS. The estimated coefficient of -.0946 indicates that discretionary disclosure levels by US cross-listed firms is negatively related to mean forecast error, assuming all other things are constant. In other words, as the number of

discretionary disclosures increases, mean forecast error decreases. The estimated coefficient for disclosure precision is .0618 and significant at alpha ≤ .05. This result indicates that mean forecast error for the US cross-listed firms increases as discretionary disclosure precision increases. Diagnostic tests, e.g., tests for multicollinearity between the discretionary disclosure measures and the influence of extreme observations, are conducted to explain this result. The diagnostic tests indicate no multicollinearity problems. The model is also estimated excluding the five largest and smallest discretionary disclosure observations. The estimated coefficients are not influenced by excluding the extreme observations. Therefore, we are left with plausible explanations for the results observed. Plausible explanations for the US results include the following: First, analysts may disagree or distrust management's interpretation of factors that affect the firm's future performance, and therefore discount the firm's assessment of its future performance. Second, while management has a comparative advantage in firm-specific data gathering and analysis, this does not necessarily apply to industry and general economic trends that are expected to affect the firm's future operating performance. In other words, analysts may rely more heavily on their own assessments of the firm's future performance and independent forecasters of economic and industry trends [Jennings 1987].

The estimated effect of discretionary disclosure level on forecast error in the UK is given by the coefficient on *VDS* (-.0946) plus the estimated coefficient for *Country*VDS* (.156). The estimated coefficient of .0614 indicates that discretionary disclosure levels by UK cross-listed firms is positively related to mean forecast error, assuming all other things are constant. In other words, as the number of discretionary

disclosures increases, mean forecast error for the UK firms increases. The estimated coefficient for disclosure precision is -.0712 (i.e., 0618 + -.133). This result indicates that mean forecast error for the UK cross-listed firms decreases as discretionary disclosure precision increases. Given that the discretionary disclosure precision measure, which is based on the AICPA recommended disclosures, represents more informative disclosures, forecasts of UK cross-listed firms earnings are enhanced more precise disclosures, with precision as defined earlier in the study.

Overall, the disclosure level and precision scores of the firms included in this study indicate that relatively few of the discretionary disclosures recommended by the AICPA and ICAEW are currently disclosed by US and UK cross-listed firms. Furthermore, the recommendation of increased discretionary disclosure to improve expectations is generally supported by the results in this study. However, there are questions regarding the relationship between discretionary disclosure precision and forecast error in the US. It appears that the relationship between discretionary disclosure and forecast error is country-specific, with discretionary disclosures explaining differences in forecast error across the US and UK cross-listed firms in the study.

6.4 Test of Hypothesis 4: Discretionary Disclosure and Forecast Dispersion

The fourth research question addresses whether discretionary disclosure is related to differences in forecast dispersion across US and UK cross-listed firms. Equation (10) is estimated using ordinary least squares regression to test whether discretionary disclosure explains the variation in forecast dispersion across US and UK

cross-listed firms. Table 10 presents the results of the model. The overall model is significant with an Adjusted R-square of .530, indicating that the fitted model explains a significant portion of the variation in forecast dispersion, i.e., the level of agreement among analysts' forecasts. Partial F-tests to check the significance of the control variables produced significant F-statistics for country, industry, forecast horizon, earnings stability, and firm size.

Hypothesis 4 is tested by noting the significance of the estimated coefficients for $Country_j * VDS_{j,t-1}$ and $Country_j * PVDS_{j,t-1}$. The variables produced F-statistics of 5.606 and 36.633, both significant at the $\leq .05$ level of significance. These results indicate that the level and precision of discretionary disclosure explains differences in forecast dispersion for the US and UK cross-listed firms, with the estimated effect of discretionary disclosure greater for the US firms. Therefore, null hypothesis 4 is rejected in favor of the alternative hypothesis.

Table 12 presents the estimated coefficients for the US and UK forecast dispersion model. Mean forecast dispersion is 1.021 greater for the UK cross-listed firms than for the US cross-listed firms. This result indicates that there is less consensus among analysts who forecast UK cross-listed firms' earnings. This result suggests that the information sets of analysts who forecast UK cross-listed firms earnings differ more extensively than the information sets of analysts who forecast US cross-listed firms earnings. Differences in the information sets among analysts across the US and UK may reflect the cost and or availability of information across the two countries.

Similar to the forecast error horizon, mean forecast dispersion or the level of disagreement among analysts decreases as the month in which the forecasts are made approaches the fiscal year end. This result is consistent across the US and UK firms.

The estimated coefficient on *VDS* for the US cross-listed firms is -.0451, indicating that forecast dispersion decreases as the level of discretionary disclosure increases. The estimated coefficient on *PVDS* for the US cross-listed firms is .0435, indicating that as discretionary disclosure precision increases, forecast dispersion increases. Again this result, which is consistent with the forecast error result, is counterintuitive.

The estimated coefficient on *VDS* for the UK cross-listed firms is .0011 (i.e., -.0451 + .0462). The estimated coefficient is positive, but the magnitude of the effect is very small. This result is considered counterintuitive, as is the positive coefficient on disclosure precision for the US firms in the sample. The estimated coefficient on *PVDS* for the UK cross-listed firms is -.01765 (i.e., .0435 + -.06115), indicating that forecast dispersion decreases as the precision of discretionary disclosures increases. These results are consistent with the forecast error model results, which to some extent indicates the validity of the disclosure measures.

In summary, the effect of discretionary disclosure appears to be different across the US and UK cross-listed firms in the study. Discretionary disclosure levels appear to be more useful in forecasting US firms' earnings, whereas disclosure precision appears to be more useful in forecasting UK firms' earnings.

CHAPTER VII

7. CONCLUSIONS

The results of this study indicate that the US cross-listed firms provide more discretionary disclosure than the UK cross-listed firms. This result refutes the contentions of Gray, Radebaugh, and Roberts (1990) that US firms will disclose less information voluntarily than UK firms because of the extensive mandatory disclosures in the US. Since US cross-listed firms provide more discretionary disclosure, perhaps other firm specific factors, e.g., firm size, the degree of leverage, ownership structure, industry concentration, and market concerns, determine firms' discretionary disclosure policies.

Frost and Pownall (1994) posit that US cross-listed firms provide more discretionary disclosures than UK cross-listed firms because of US analysts' greater demand for information. *A priori*, UK cross-listed firms must meet similar demands for information and therefore may provide equivalent levels of disclosure. Analysts' following may contribute to the difference in disclosure across the US and UK cross-listed firms. Cho (1994) finds that analyst following is significantly less for UK firms than for US firms. Assuming this result is applicable to US and UK cross-listed firms, UK cross-listed firms may not face the same demands for information; and therefore provide less disclosure on a voluntary basis.

In light of the AICPA and ICAEW recommendations, the purpose of this dissertation is to examine whether discretionary disclosures explain the variation in forecast error and dispersion across the US and UK. The results of this study indicate

discretionary disclosures do in fact explain, at least in part, the variation in forecast error and dispersion across the US and UK cross-listed firms in the sample. Also, in light of the AICAP and ICAEW recommendation of increased discretionary disclosure to improve expectations, the relationship between discretionary disclosure and forecast error and dispersion for the US and UK firms is examined. The results of this study indicate that the relationship between discretionary disclosure and analysts' forecast characteristics may be country-specific. For the US sample firms, contrary to *a priori* expectations, discretionary disclosure precision is positively related to forecast error and dispersion. However, discretionary disclosure level is negatively related to forecast error and dispersion. For the UK sample firms, discretionary disclosure precision is negatively related to forecast error and forecast dispersion. However, discretionary disclosure level is positively related to forecast and dispersion.

7.1 Limitations

First, this study does not consider the information disseminated by firms via disclosure media other than the annual financial report to shareholders or the SEC 10-K filing. For example, interim reports and press releases issued during the year are not considered in this study. Consequently, the discretionary disclosures included in the annual report do not represent a comprehensive examination of all discretionary disclosure. However, prior research suggests that firms' disclosure policies tend to be consistent across disclosure media [Lang and Lundholm 1993]. Therefore the level and precision of discretionary disclosure in the annual report should serve as a good proxy for discretionary disclosure across disclosure media [Botosan 1997].

Second, the disclosure index does not include a complete list of discretionary disclosure possibilities. In the interest of objectivity and reliability, the index includes items that all firms could disclose. The list is reasonably complete to ensure variation in the level of disclosure. Also, to ensure an interval scale of measurement, this study assumes that the disclosure items are equally weighted. The extent to which disclosure items are weighted differently by analysts, equal weighting of the disclosure items represents a limitation to the present study.

Comparing the relationship between analyst forecasts and discretionary disclosure across countries requires adequate controls for differences in the flexibility of US and UK measurement practices. Appendix A summarizes significant differences in US and UK GAAP measurement techniques. To control for differences in the flexibility of US and UK accounting principles, an earnings stability measure is included in the regression model. The extent to which earnings stability does not proxy for differences in the flexibility of GAAP, or the ability to produce a less volatile earnings stream, differences in accounting principles is a significant limitation when comparing the effect of discretionary disclosure on analysts' forecasts in the US and the UK.

7.2 Future Research

Examining disclosures by information type is a useful extension of the current study. The significance of discretionary disclosure may differ across discretionary disclosure types. For example, recent discussions on improving financial reporting emphasize forward-looking information [AICPA Special Committee on Financial

Reporting 1994]. Whether forward-looking information in particular improves analysts' forecasts remains an empirical question.

The results reported in this dissertation indicate the importance of discretionary disclosure in reducing the level of disagreement among analysts. Future research on individual analysts' forecasts may provide insights into whether forecast dispersion among analysts is the result of differences in their forecast models, information set, or expertise.

Various theoretical disclosure models attempt to identify determinants of the discretionary disclosure decision. These models have identified factors that affect the disclosure decision and often predict conflicting disclosure policies. The development of empirical proxies for constructs identified in the disclosure models would be useful. These proxies may provide insight into the relative impact of the factors that affect the discretionary disclosure decision.

Prior research has examined whether analysts' forecasts exhibit systematic bias, or whether analysts' forecasts incorporate all available information, including prior forecast errors. Future research that examines forecast bias may be useful in assessing whether forecast error is associated with systematic forecast bias. In other words, forecast error may be due to analysts' incentives to provide optimistic forecasts. Systematic overstatement or understatement of firms' earnings may indicate that analyst forecasts are not rational expectations and do not incorporate all available information in an unbiased manner.

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Appendix A

Major Differences in US and UK Accounting Principles

	U.S More Conservative	*UK More Conservative*
1. Asset valuation basis	X	
2. Business Combinations	X	
3. Consolidated Financial Statements	X	
4. Accounting for Goodwill	X	
5. Foreign Currency Translation	X	
6. Inventory Valuation	X	
7. Investment Properties	X	
8. Capitalization of Interest Costs		X
9. Research and Development Expenditure	X	
10. Capitalization of Computer Software	X	
11. Intangible Assets	X	
12. Taxation Accounting	X	
13. Extraordinary Items	X	

Source: Lee Radebaugh and Sidney Gray, *International Accounting and Multinational Enterprises.* Third Edition.(1993), p.376.

Appendix B

Discretionary Disclosure Index

I. Background Information

1. Corporate goals or objectives
2. Description of the business
3. Principle products
4. Principle markets
5. Impact of industry structure on firm

II. Financial and Nonfinancial Data

6. Number of employees
7. Average compensation per employee
8. Market share
9. Units sold
10. Order backlog
11. Selling prices
12.. Quality of products or services
13. Customer satisfaction
14. Volume of materials consumed
15. Prices of materials consumed
16. New product development
17. Employee turnover/employee satisfaction
18. Average age of assets
19. Ratio of outputs to inputs
20. Employee productivity
21. Efficiency measures
22. Capacity measures
23. Market locations
24. Operating locations

III. Management Discussion and Analysis

Liquidity

25. Each internal and external source of liquidity
26. Events likely to result in a change in liquidity
27. New Lines of Credit
28. Material Capital expenditures (effect on liquidity)
29. Proposed sources of funds to satisfy capital expenditures
30. Proposed sources of funding to satisfy contingencies
31. For deficiencies course of action taken
32. Material unused sources of liquid assets

Results of Operations

33. Significant economic changes that materially affect the amount of reported income from operations
34. Extent to which income was affected
35. Any significant components of revenues or expense

36. Known trends that will have a material favorable or unfavorable impact on net sales or revenues or income from continuing operations
37. Impact of inflation on net sales and revenues
38. Impact of inflation on income from continuing operations
39. Price change effects on net sales or revenues
40. Price by segment
41. Sales volume effects on net sales or revenues
42. Volume by segment
43. Net sales or revenue from introduction of new goods
44. Demand

Capital Resources

45. Commitments for capital expenditures (use of capital resources)
46. Source of funds for commitments
47. Trends, favorable or unfavorable, in capital resources
48. Trends in expenditures of funds
49. Equity, debt and off-balance sheet financing arrangement

Anticipatory Information

Liquidity:

50. Anticipated trends likely to result in a change in liquidity
51. Proposed sources of funding to satisfy anticipated trends

Results of Operations:

52. Anticipated trends with future material impact on revenues
53. Anticipated trends with future material impact on income from continuing operations

Capital Resources:

54. Anticipated trends in sources of funds
55. Anticipated trends in expenditures of funds
56. Anticipated changes in the mix of capital resources

Management forecasts

57. Sales
58. Earnings
59. Market share
60. Cash flow
61. Capital expenditures and/or R&D expenditure forecast

IV. Forward-looking Information

Opportunities and Risks

62. Threat from substitute products or services
63. Bargaining power of customers, suppliers, or employees
64. Nature of competitive environment
65. Risks from participating in additional industries
66. Risks from concentrations in assets, customers, or suppliers
67. Key management assumptions
68. Comparison of actual business performance to previously disclosed opportunities, risks, and management's plans

Appendix C

Precision Index

1. Is the item disclosed quantified?

   range

   point estimate
2. Does the firm disclose the change in the item?
3. Does the firm discuss causes or reasons for the item (i.e. does the firm link the item disclosed with business decisions/event affecting the item?
4. Does the firm quantify causes or reasons for the item?
5. Does the firm discuss any transitory or permanent effects of the item disclosed?
6. Does the firm quantify any transitory or permanent effects?

Appendix D

Economic Predictor Variables

Purpose

The purpose of this Appendix is to demonstrate the relationship between actual changes in earnings and forecasts of economic factors. If actual changes in earnings are related to actual or expected changes in economic predictor variables, errors in economic forecasts are expected to be correlated with analysts' earnings forecast errors since analysts include economic forecasts in their earnings forecast model. Herrmann (1996) describes expected changes in earnings as a function of expected changes in economic factors. The model is described as follows:

$$E[X_{j,t+1}] = f(X_{t-i}, E[\Delta GNP_{t+1}], E[\Delta FX_{t+1}], E[\Delta INF_{t+1}] \qquad (13)$$

where

$E[X_{j,t+1}]$ = the expected value of firm j earnings in period t+1

$X_{j,t-i}$ = firm j earnings in period $t-i$

$E[\Delta FX_{t+1}]$ = expected change in exchange rates from period t to t+1.

$E[\Delta INF_{t+1}]$ = expected change in inflation from period t to t +1

$E[\Delta GNP_{t+1}]$ = expected change in real GNP from period t to t+1.

Consistent with Herrmann (1996), analysts use forecasts of changes in exchange rates, inflation, and GNP to forecast firms' earnings. The intuition is that a firm's operating performance is directly correlated with the economic activity of the country in which it operates.

O'Brien (1989) suggests that forecast errors may be due to unexpected changes in economic factors. Because of data limitations, the economic factors are not included in the forecast error (dispersion) model. However, to determine whether analyst forecast errors may be correlated with unexpected changes in any of the economic factors, actual changes in earnings are regressed

on actual and expected changes in the economic factors. If the change in earnings is correlated with actual or expected changes in the economic factors, unexpected changes in the economic factors may be correlated with forecast errors.

Model Specification

One-year- ahead regression forecast models described in BHS [1990] and Herrmann [1996] are used to test whether expected changes in macroeconomic factors are useful in predicting changes in earnings. The model of economic forecast variables is first run assuming perfect foresight of the changes in economic factors. The model is run a second time to allow for errors in the economic forecasts. The following equation is estimated for the years 1991 to 1996.

$$\ln Y_{jt+1} - \ln Y_{jt} = a_0 + \beta_1(Expfx_{t+1}) + \beta_2(Exp\inf_{t+1}) + \beta_3(Egnp_{t+1}) + \beta_4(Expfx_{t+1} * Exp\inf_{t+1}) + \beta_5(Expfx_{t+1} * Expgnp_{t+1}) + \beta_6(Exp\inf_{t+1} * Expgnp_{t+1}) + \beta_7(Expfx_{t+1} * Exp\inf_{t+1} * Expgnp_{t+1}) + \varepsilon \quad (8$$

where

Y_{jt+1}	=	the actual value of earnings of firm j in period t +1
Y_{jt}	=	the actual value of earnings of firm j in period t
$Expfx_{t+1}$	=	the expected change in real effective exchange rates from period t to period t+1
$Exp\inf_{t+1}$	=	the expected change in inflation from period t to period t+1
$Expgnp_{t+1}$	=	the expected change in GNP from period t to period t+1

The next section discusses the economic forecast variables and the data sources for the variables.

Economic Factors

Actual and expected changes in real GNP (GDP for UK firms) and inflation (GNP deflators) are obtained from the *OECD Economic Outlook* for the years 1991 to 1996. The forecasts of real GNP (nominal GNP adjusted for inflation), and inflation are based on the

economic forecasters assessment of the world economy, drawing on UK and US general economic and area analyses. In light of the economic and market relationships among countries, forecasts of national economic developments account for the international trade and financial linkages among countries.

The actual changes in the real effective exchange rate for the US were obtained from the *International Financial Statistics*. The exchange rates are defined broadly as a real effective exchange rate index, i.e. an exchange rate adjusted for relative movements in national price or cost indicators of the home country and its partner or competitor countries. [International Financial Statistics, October 1994]. As suggested by BHS (1990) and Herrmann (1996), a random walk model for expected changes in exchange rates is used to test the relationship between changes in actual earnings and changes in expected exchange rates.

As noted previously, equation (8) is also estimated assuming perfect foresight and actual changes in the economic predictor variables are regressed on the actual changes in earnings. The model results are presented in the accompanying tables in this appendix. The results indicate that actual changes, as well as expected changes in economic factors are not related to changes in earnings. Therefore, the none of the economic predictor variables are included in the forecast error (dispersion) model presented in this study.

Appendix D (continued)

Forecast Error Model of Economic Predictor Variables: Assuming Perfect Foresight

$$lnY_{j,t+1} - lnY_{j,t} = a_0 + Country_j + b_1Actfx + b_2Actinf + b_3Actgnp + b_4Actfx*Actinf + b_5Actfx*Actgnp + b_6Actinf*Actgnp + b_7Actfx*Actinf*Actgnp + e$$

Dependent variable: $lnY_{j,t+1} - lnY_{j,t}$

COUNTRY	N
UK (UK = 0)	326
U.S. (U.S. = 1)	321

	F	Significance level
Intercept	.005	.944
Country	1.630	.202
Actfx	1.258	.262
Actinf	.001	.973
Actgnp	.262	.609
Actfx*Actinf	1.221	.270
Actfx*Actgnp	.644	.423
Actinf*Actgnp	2.093	.148
Actfx*Actinf*Actgnp	.089	.766

R Squared = .069 (Adjusted R Squared = .058)

Appendix D (continued)

Forecast Error Model of Economic Predictor Variables

$$lnY_{j,t+1} - lnY_{j,t} = a_0 + Country_j + b_1Expfx + b_2Expinf + b_3Expgnp + b_4Expfx*Expinf + b_5Expfx*Expgnp + b_6Expinf*Expgnp + b_7Expfx*Expgnp*Expinf + e$$

Dependent variable: $lnY_{j,t+1} - lnY_{j,t}$	
COUNTRY	N
UK (UK = 0)	326
U.S. (U.S. = 1)	321

	F	Significance level
Intercept	.093	.760
Country	1.120	.290
Expfx	.258	.612
Expinf	.473	.492
Expgnp	.029	.865
Expfx*Expinf	.130	.718
Expfx*Expgnp	.133	.716
Expinf*Expgnp	.516	.473
Expfx*Expgn*Expinf	.006	.939

R Square = .073 (Adjusted R Square = .062)

Table 1

Number of Firms in Sample

	US	UK
Cross-listed firms from 1994 International Stock Exchange	218	169
Less: Firms with no I/B/E/S data	(129)	(89)
Less: Firms with no annual report data available	(12)	(6)
Less: Financial institutions	(6)	(3)
Less: Number of firms with stock splits for the years 1993 or 1995	(0)	(0)
Total number of firms in sample	71	71

Table 2

Sector classifications and sector codes

Classification	Code	US	UK
Insurance	01	10	6
Health Care	02	5	6
Consumer Nondurables	03	5	9
Consumer Services	04	3	19
Consumer Durables	05	7	0
Energy	06	4	5
Transportation	07	2	1
Technology	08	8	3
Building and Related Materials	09	8	5
Merchandising	10	9	9
Public Utilities	11	10	8
Total Firms		71	71

Table 3

Summary statistics for tests of differences for US and UK discretionary Disclosure

	Country	N	Mean	Std. Deviation	t-test for Equality of Means: Mean Difference	t	Sig. (2-tailed)
VDS							
	UK	96	12.9688	4.2660			
	US	97	16.5979	4.9152	-3.6292	-5.480	.000
PVDS							
	UK	96	14.0885	7.4360			
	US	97	18.7567	8.4249	-4.6682	-4.082	.000

Table 4

Summary statistics for tests of differences for the years 1993 and 1995

Panel A: US Firms Sampled

					t-test for Equality of Means	
	YEAR	N	Mean	Std. Deviation	Mean Difference	t	Sig. (2-tailed)
VDS							
	1993	45	15.4444	3.9918			
	1995	51	17.5882	5.4888	-2.1438	-2.206	.030
PVDS							
	1993	45	17.4311	7.0016			
	1995	51	19.9216	9.4960	-2.4905	-1.473	.144

Panel B: U.K. Firms Sampled

					t-test for Equality of Means	
	YEAR	N	Mean	Std. Deviation	Mean Difference	t	Sig. (2-tailed)
VDS							
	1993	44	11.9773	3.9912			
	1995	52	13.8077	4.3478	-1.8304	-2.149	.034
PVDS							
	1993	44	12.1818	6.1683			
	1995	52	15.7019	8.0703	-3.5201	-2.419	.017

Table 5

Correlation Statistics for US Forecast Error Model

	LnError	VDS	PVDS	LnEarn	LnSIZE
LnError	1.000	-.091*	-.016	.033	-.394*
VDS		1.000	.834*	-.091*	.144*
PVDS			1.000	-.026	.217*
LnEarn				1.000	-.031
LnSize					1.000

*Significant at the alpha $\leq$ .05 level

Table 6

Correlation Statistics for UK Forecast Error Model

	LnError	VDS	PVDS	LnEarn	LnSize
LnError	1.000	-.084	-.171*	.152*	-.248*
VDS		1.000	.641*	-.018	.160*
PVDS			1.000	-.131*	.173*
LnEarn				1.000	.058
LnSize					1.000

*Significant at the alpha $\leq .05$ level

Table 7

Correlation Statistics for US Forecast Dispersion Model

	LnCV	VDS	PVDS	LnEarn	LnSize
LnCV	1.000	-.016	.143*	.211*	-.377*
VDS		1.000	.841*	-.087*	.165*
PVDS			1.000	-.030	.236*
LnEarn				1.000	-.051
LnSize					1.000

*Significant at the alpha $\leq .05$ level

Table 8

Correlation Statistics for UK Forecast Dispersion Model

	LnCV	VDS	PVDS	LnEarn	LnSize
LnCV	1.000	-.219*	-.205*	-.126*	-.348*
VDS		1.000	.639*	-.019	.158*
PVDS			1.000	-.130*	.175*
LnEarn				1.000	.060
LnSize					1.000

*Significant at the alpha $\leq .05$ level

Table 9

US and UK Forecast Error Model

$$LnFE_{j,t} = \alpha_0 + \beta_1 VDS_{j,t-1} + \beta_2 PVDS_{j,t-1} + \beta_3 lnEarn_{j,t-5} + \beta_4 lnSize_{j,t} + \beta_5 Country + \Sigma\delta_i Ind_{i,j,t} + \Sigma\gamma_i Hor_{i,j,t} + \beta_6 Year + \beta_7 Country*VDS_{j,t-1} + \beta_8 Country*PVDS_{j,t-1} + \beta_9 Country * lnEarn_{j,t-5} + \beta_{10} Country*lnSize_{j,t} + \beta_{11} Country*\Sigma\delta_i Ind_{i,j,t} + \beta_{12} Country* \Sigma\gamma_i Hor_{i,j,t} + \beta_{13} Country*Year + \varepsilon$$

Variable	df	F
Corrected Model	50	10.637**
Intercept	1	40.573**
VDS	1	.661
PVDS	1	.194
LnEarn	1	.591**
LnSize	1	56.564**
Country	1	4.258**
Ind	10	9.093**
Hor	11	4.869**
Year	1	.327
Country * VDS	1	14.911**
Country * PVDS	1	41.036**
Country * LnEarn	1	6.374**
Country * LnSize	1	37.615**
Country * Ind	8	8.882**

Table 9 (continued)

US and UK Forecast Error Model

$$LnFE_{j,t} = \alpha_0 + \beta_1 VDS_{j,t-1} + \beta_2 PVDS_{j,t-1} + \beta_3 lnEarn_{j,t-5} + \beta_4 lnSize_{j,t} + \beta_5 Country + \Sigma\delta_i Ind_{i,j,t} + \Sigma\gamma_i Hor_{i,j,t} + \beta_6 Year + \beta_7 Country*VDS_{j,t-1} + \beta_8 Country*PVDS_{j,t-1} + \beta_9 Country*lnEarn_{j,t-5} + \beta_{10} Country*lnSize_{j,t} + \beta_{11} Country*\Sigma\delta_i Ind_{i,j,t} + \beta_{12} Country*\Sigma\gamma_i Hor_{i,j,t} + \beta_{13} Country*Year + \varepsilon$$

Variable	df	F
Country * Hor	10	.573
Country * Year	1	2.857
Error	937	
Total	988	
Corrected Total	987	

Adjusted R Squared = .328
**Significant at alpha $\leq$ .05

Table 10

Estimated Coefficients for the US and UK Forecast Error Model

$$LnFE_{j,t} = \alpha_0 + \beta_1 VDS_{j,t-1} + \beta_2 PVDS_{j,t-1} + \beta_3 lnEarn_{j,t-5} + \beta_4 lnSize_{j,t} + \beta_5 Country + \Sigma\delta_i Ind_{i,j,t} + \Sigma\gamma_i Hor_{i,j,t} + \beta_6 Year + \beta_7 Country*VDS_{j,t-1} + \beta_8 Country*PVDS_{j,t-1} + \beta_9 Country*lnEarn_{j,t-5} + \beta_{10} Country*lnSize_{j,t} + \beta_{11} Country*\Sigma\delta_i Ind_{i,j,t} + \beta_{12} Country*\Sigma\gamma_i Hor_{i,j,t} + \beta_{13} Country*Year + \varepsilon$$

Predictor Variable	B	Std. Error	t statistic
Intercept	-.918	.400	-2.296**
VDS	-.0946	.023	-4.168**
PVDS	.0618	.013	4.805**
LnEarn	-.6804	.060	-1.131
LnSize	-.532	.041	-12.814**
Country	-1.069	.700	-1.528
Ind 01	-.497	.224	-2.219**
Ind 02	-1.304	.268	-4.859**
Ind 03	-1.058	-.200	-5.302**
Ind 04	-.402	.296	-1.358
Ind 05	-.999	.228	-4.386**
Ind 06	-.415	.266	-1.563
Ind 07	-1.485	.329	-4.521**
Ind 09	-.552	.253	-2.179**

Table 10 (continued)

Estimated Coefficients for the US and UK Forecast Error Model

$$LnFE_{j,t} = \alpha_0 + \beta_1 VDS_{j,t-1} + \beta_2 PVDS_{j,t-1} + \beta_3 lnEarn_{j,t-5} + \beta_4 lnSize_{j,t} + \beta_5 Country + \Sigma\delta_i Ind_{i,j,t} + \Sigma\gamma_i Hor_{i,j,t} + \beta_6 Year + \beta_7 Country*VDS_{j,t-1} + \beta_8 Country*PVDS_{j,t-1} + \beta_9 Country*lnEarn_{j,t-5} + \beta_{10} Country*lnSize_{j,t} + \beta_{11} Country*\Sigma\delta_i Ind_{i,j,t} + \beta_{12} Country*\Sigma\gamma_i Hor_{i,j,t} + \beta_{13} Country*Year + \varepsilon$$

Predictor Variable	β	Std. Error	t statistic
Ind 10	-.315	.211	-1.496
Hor = -11	1.463	.429	3.410**
Hor = -10	1.127	.239	4.710**
Hor = -09	1.095	.236	4.635**
Hor = -08	.978	.235	4.153**
Hor = -07	.885	.238	3.718**
Hor = -06	.738	.239	3.087**
Hor = -05	.483	.238	2.029**
Hor = -04	.428	.239	1.790
Hor = -03	.228	.237	.960
Hor = -02	.178	.237	.750
Hor = -01	.159	.242	.656
Year	-.276	.128	-2.159**
Country * VDS	.156	.040	3.861**
Country * PVDS	-.133	.021	-6.406**

Table 10 (continued)

Estimated Coefficients for the US and UK Forecast Error Model

$$LnFE_{j,t} = \alpha_0 + \beta_1 VDS_{j,t-1} + \beta_2 PVDS_{j,t-1} + \beta_3 lnEarn_{j,t-5} + \beta_4 lnSize_{j,t} + \beta_5 Country + \Sigma\delta_i Ind_{i,j,t} + \Sigma\gamma_i Hor_{i,j,t} + \beta_6 Year + \beta_7 Country*VDS_{j,t-1} + \beta_8 Country*PVDS_{j,t-1} + \beta_9 Country*lnEarn_{j,t-5} + \beta_{10} Country*lnSize_{j,t} + \beta_{11} Country*\Sigma\delta_i Ind_{i,j,t} + \beta_{12} Country*\Sigma\gamma_i Hor_{i,j,t} + \beta_{13} Country*Year + \varepsilon$$

Predictor Variable	β	Std. Error	t statistic
Country * lnEarn	.196	.078	2.525**
Country * lnSize	.478	.078	6.133**
Country * Ind 01	-1.300	.485	-2.683**
Country * Ind 02	-.07923	.512	-.155
Country * Ind 03	-1.019	.459	-2.220**
Country * Ind 04	-1.731	.504	-3.438**
Country * Ind 07	1.413	.686	2.061**
Country * Ind 09	.528	.502	1.051
Country * Ind 10	-.874	.520	-1.681
Country * Ind 11	.968	.491	1.973**
Country * Year	.413	.244	1.690

**Significant at alpha $\leq$ .05

Table 11

US and UK Forecast Dispersion Model

$$LnCV_{j,t} = \alpha_0 + \beta_1 VDS_{j,t-1} + \beta_2 PVDS_{j,t-1} + \beta_3 lnEarn_{j,t-5} + \beta_4 lnSize_{j,t} + \beta_5 Country + \Sigma\delta_i Ind_{i,j,t} + \Sigma\gamma_i Hor_{i,j,t} + \beta_6 Year + \beta_7 Country*VDS_{j,t-1} + \beta_8 Country*PVDS_{j,t-1} + \beta_9 Country*lnEarn_{j,t-5} + \beta_{10} Country*lnSize_{j,t} + \beta_{11} Country*\Sigma\delta_i Ind_{i,j,t} + \beta_{12} Country*\Sigma\gamma_i Hor_{i,j,t} + \beta_{13} Country*Year + \varepsilon$$

Source	df	F
Corrected Model	50	23.390**
Intercept	1	123.445**
VDS	1	5.208**
PVDS	1	6.548**
LnEarn	1	7.191**
LnSize	1	33.221**
Country	1	4.970**
Ind	10	32.742**
Year	1	.430
Country * VDS	1	5.606**
Country * PVDS	1	36.633**
Country * LnEarn	1	25.612**
Country * LnSize	1	44.863**
Country * Ind	8	5.254**
Country * Hor	10	.917
Country * Year	1	.029

Table 11 (continued)

US and UK Forecast Dispersion Model

$$LnCV_{j,t} = a_0 + b_1 VDS_{j,t-1} + b_2 PVDS_{j,t-1} + b_3 lnEarn_{j,t-5} + b_4 lnSize_{j,t} + b_5 Country + \Sigma\delta_i Ind_{i,j,t} + \Sigma\gamma_i Hor_{i,j,t} + b_6 Year + b_7 Country*VDS_{j,t-1} + b_8 Country*PVDS_{j,t-1} + b_9 Country*lnEarn_{j,t-5} + b_{10} Country*lnSize_{j,t} + b_{11} Country*\Sigma\delta_i Ind_{i,j,t} + b_{12} Country*\Sigma\gamma_i Hor_{i,j,t} + b_{13} Country*Year + \varepsilon$$

Source	df	F
Error	942	
Total	993	
Corrected Total	992	

Adjusted R Square = .530
**Significant at alpha $\leq$ .05

Table 12

Estimated Coefficients for the US and UK Forecast Dispersion Model

$$LnCV_{j,t} = \alpha_0 + \beta_1 VDS_{j,t-1} + \beta_2 PVDS_{j,t-1} + \beta_3 lnEarn_{j,t-5} + \beta_4 lnSize_{j,t} + \beta_5 Country + \Sigma\delta_i Ind_{i,j,t} + \Sigma\gamma_i Hor_{i,j,t} + \beta_6 Year + \beta_7 Country*VDS_{j,t-1} + \beta_8 Country*PVDS_{j,t-1} + \beta_9 Country*lnEarn_{j,t-5} + \beta_{10} Country*lnSize_{j,t} + \beta_{11} Country*\Sigma\delta_i Ind_{i,j,t} + \beta_{12} Country*\Sigma\gamma_i Hor_{i,j,t} + \beta_{13} Country*Year + \varepsilon$$

Predictor Variable	β	Std. Error	t statistic
Intercept	1.351	.194	6.965**
VDS	-.0451	.011	-4.183**
PVDS	.0435	.006	6.980**
LnEarn	.145	.029	5.030**
LnSize	-.260	.020	-12.998**
Country	1.021	.355	2.875**
Ind 01	-.329	.110	-2.991**
Ind 02	-1.216	.125	-9.742**
Ind 03	-1.024	.097	-10.592**
Ind 04	-.540	.143	-3.791**
Ind 05	-.394	.111	-3.540**
Ind 06	.435	.129	3.384**
Ind 07	.09218	.154	-.599
Ind 09	.192	.125	1.545

Table 12 (continued)

Estimated Coefficients for the US and UK Forecast Dispersion Model

$$LnCV_{j,t} = \alpha_0 + \beta_1 VDS_{j,t-1} + \beta_2 PVDS_{j,t-1} + \beta_3 lnEarn_{j,t-5} + \beta_4 lnSize_{j,t} + \beta_5 Country + \Sigma\delta_i Ind_{i,j,t} + \Sigma\gamma_i Hor_{i,j,t} + \beta_6 Year + \beta_7 Country*VDS_{j,t-1} + \beta_8 Country*PVDS_{j,t-1} + \beta_9 Country*lnEarn_{j,t-5} + \beta_{10} Country*lnSize_{j,t} + \beta_{11} Country*\Sigma\delta_i Ind_{i,j,t} + \beta_{12} Country* \Sigma\gamma_i Hor_{i,j,t} + \beta_{13} Country*Year + \varepsilon$$

Predictor Variable	β	Std. Error	t statistic
Ind 10	-.545	.101	-5.368**
Hor = -11	.679	.205	3.315**
Hor = -10	.630	.113	5.548**
Hor = -09	.620	.112	5.559**
Hor = -08	.611	.112	5.473**
Hor = -07	.534	.113	4.725**
Hor = -06	.485	.112	4.310**
Hor = -05	.417	.113	3.692**
Hor = -04	.347	.113	3.076**
Hor = -03	.298	.113	2.641**
Hor = -02	.173	.113	1.528
Hor = -01	.0703	.112	.625
Year	.04885	.061	.799
Country * VDS	.04624	.020	2.368**
Country * PVDS	-.06115	.010	-6.052**

Table 12 (continued)

Estimated Coefficients for the US and UK Forecast Dispersion Model

$$LnCV_{j,t} = \alpha_0 + \beta_1 VDS_{j,t-1} + \beta_2 PVDS_{j,t-1} + \beta_3 lnEarn_{j,t-5} + \beta_4 lnSize_{j,t} + \beta_5 Country + \Sigma\delta_i Ind_{i,j,t} + \Sigma\gamma_i Hor_{i,j,t} + \beta_6 Year + \beta_7 Country*VDS_{j,t-1} + \beta_8 Country*PVDS_{j,t-1} + \beta_9 Country*lnEarn_{j,t-5} + \beta_{10} Country*lnSize_{j,t} + \beta_{11} Country*\Sigma\delta_i Ind_{i,j,t} + \beta_{12} Country*\Sigma\gamma_i Hor_{i,j,t} + \beta_{13} Country*Year + \varepsilon$$

Predictor Variable	β	Std. Error	t statistic
Country * lnEarn	-.190	.038	-5.061**
Country * lnSize	.279	.042	6.698**
Country * Ind 01	-.332	.238	-1.399
Country * Ind 02	.530	.252	2.108**
Country * Ind 03	.05899	.231	.255
Country * Ind 04	-.696	.253	-2.752**
Country * Ind 07	.007401	.345	.021
Country * Ind 09	-.101	.251	-.403
Country * Ind 10	.07406	.258	.287
Country * Ind 11	-.269	.274	-.985
Country * Year	.0202	.118	-.171

**Significant at alpha $\leq .05$

Figure 1

Six Main Classes of Disclosure Models

Management's Maximization Objective	Users of Disclosed Information Investors Only	Users of Disclosed Information Investors and Third Party
Total Value	1	4
Original Shareholder's Wealth	2	5
Managerial Utility	3	6

Source: Martin Walker, (1997). *The Economics of Corporate Financial Communication.* Association of Chartered Certified Accountants, Occasional Research Paper No. 19, p. 7.

VITA

Cynthis L. Taylor

Candidate for the Degree of

Doctor of Philosophy

Thesis: DISCRETIONARY DISCLOSURES OF US AND UK CROSSLISTED FIRMS: IS THERE AN INFORMATION EXPLANATION OF FORECAST ACCURACY AND DISPERSION?

Major Field: Business Administration

Biographical:

Personal Data: Born in Little Rock, Arkansas, May 26, 1968, the daughter of Henry and Catherine P. Taylor.

Education: Graduated from Ole Main High School, North Little Rock, Arkansas in May 1986; received Bachelor of Science Degree in Accounting from the University of Arkansas at Little Rock in May 1991; received Master of Business Administration Degree from the University of Arkansas at Little Rock in May 1993; completed the requirements for the Doctor of Philosophy Degree at Oklahoma State University in July 1998.

Experience: Internal Auditor Intern, First Commercial Bank Holding Company, Little Rock, Arkansas, 1990; Graduate Teaching Assistant, University of Arkansas at Little Rock, 1993; Accounting Instructor, Langston University, 1997.

Professional Memberships: American Accounting Association, KPMG Peat Marwick African-American, Hispanic-American, and Native American Accounting Doctoral Students Association.