20/7/95

WHAT DETERMINES AUDIT FEES? EVIDENCE FROM SINGAPORE AND MALAYSIA

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* The authors have benefitted from discussions with Ron Davidson, Trevor Wilkins, as well as participants in the Accounting Workshop at Simon Fraser U. and the 1993 Accounting session of the Asia-Pacific Finance Association. This paper was partially written while G. Poitras was a Visiting Senior Fellow at the National University of Singapore.

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ABSTRACT

Empirical studies of audit fees often involve cross section regression specifications which are motivated in an ad hoc fashion with little attention given to the underlying theoretical underpinnings. The primary focus of this study is to provide an alternative approach to specifying audit fee regressions. The data set used is derived from a sample of Singaporean and Malaysian firms which are publicly traded on the Stock Exchange of Singapore where filing requirements dictate public reporting of audit fee information.

Key words: Audit fees, Singapore accounting, Malaysia accounting

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INTRODUCTION

Since the early work on the pricing of audit services by Simunic (1980), substantial progress has been made in understanding the factors which determine audit fees. For the US and Canada, due to the limitations on publicly available data for audit fees, much of the relevant empirical research for private sector firms has been based on surveys. The limitations imposed by the availability of data have been compounded in a number of studies by the use of inadequate research methodology. Regression specifications are often motivated in an ad hoc fashion with little attention given to the underlying theoretical underpinnings. While some progress has been made in modelling the statistical behaviour of audit fees, e.g., O'Keefe, et.al. (1994), Pong and Whittington (1994), various issues have not been adequately explored. The primary focus of this study is to illustrate significant statistical shortcomings in previous work on audit fees and to provide an alternative approach to specifying audit fee regressions. The data set used is derived from a sample of Singaporean and Malaysian firms which are publicly traded on the Stock Exchange of Singapore (SES).

Unlike the US and Canada, Singaporean and Malaysian firms must satisfy filing requirements which dictate public reporting of audit fee information. This permits the use of a data set involving cross sections of firms taken at different points in time. The availability of time series information permits the testing of statistical hypotheses which cannot be tested with cross section studies based on surveys taken at a single point in time. Significantly, it is demonstrated that lagged audit fees provide fundamental information about audit fee behaviour. Variables conventionally used to explain audit fees are found to be insignificant when lagged audit fees are included in the regression equations. In the following, the next section reviews previous studies on audit fees. The following section examines relevant statistical issues and motivates the regression equations being estimated. The fourth section of the paper provides the empirical results for the regression equations which were estimated. The paper concludes with a final section summarizing the main results in the paper.

PREVIOUS STUDIES

In practice, various factors can impact the pricing of audit fees. Anecdotal information provided by auditing practitioners confirms the fundamental role played by the number of direct labour hours expended on the audit. Other important factors typically identified by practitioners include the number of site visits required to conduct the audit, the quality of the personnel required to assess the relevant items, the quality of the client, the types of items requiring auditing, the level and quality of internal auditing conducted by the client, and the number of years the auditing firm has been associated with the client. Evaluation of the relative importance of each of these factors has attracted considerable attention in the auditing literature. For example, working with data from a large public accounting firm, Davis, et.al. (1993) demonstrate that audit fees are primarily driven by the number of direct, billing-rate-adjusted labour hours dedicated to the audit. Unfortunately, most of the other available studies have been hampered by the absence of information on key variables such as labour hours. In effect, an ideal data set which has indepth information on all the relevant variables across a range of auditing firms is not available. In the absence of sufficient data, proxy variables have been used to facilitate the testing of specific hypotheses.

Following Simunic (1980), numerous empirical studies confirm the primary role of auditing effort, proxied with measures of client size and complexity. The typical proxy for client size is some function of either total assets or sales while complexity is often modelled using variables such as the number of subsidiaries. Recognizing that a significant portion of fees can be taken to be determined by a "cost-plus" method related to auditing effort, the impact of various other considerations have also been examined. These factors include: competitive conditions in audit market (Francis 1984, Francis and Stokes 1986, Balachandran and Ramakrishnan 1987, Moizer and Turley 1989, Roberts, et.al. 1990, Ettredge and Greenberg 1990, Butterworth and Houghton 1995), size of the auditing firm (Palmrose 1986), the risk of the auditee (Dye, et.al. 1990), audit contract types (Palmrose 1989), the extent of audit planning (Davidson and Gist 1995) and the provision of other accounting services to the auditee (Simunic 1984, Palmrose 1986, Abdel-Khalik 1990, Davis, et.al. 1993). While studies based on US data predominate, various aspects of this research have also been extended to

cross country data (Haskins and Williams 1988) as well as Singaporean data (Low, et.al. 1990).

Empirically, cross section regression analysis has been the statistical method of choice used in almost all studies to identify relationships between relevant variables. Considerable variation in the regression specification is observed across available studies. For example, Simunic (1980) uses a dependent variable which involves taking the ratio of audit fees to the square root of total assets. The rationale is that fees will increase at a decreasing rate as size, measured by total assets, increases. Other studies, e.g., Low (1990), Pong and Whittington (1994), Butterworth and Houghton (1995), use the level of audit fees as the dependent variable. While auditing effort is often proxied using some function of total assets as an independent variable, this often involves taking the square root of total assets as an independent variable, e.g., Low (1990). Results involving log transforms of both audit fees and total assets are also reported, e.g., Simon (1985), Palmrose (1986) and Turpen (1990), an approach which Pong and Whittington (1994) find "unduly restrictive". In addition to these variables, a wide range of additional independent variables have also been included, e.g., quick-ratio, debt-equity ratio, inventories, receivables, number of subsidiaries, previous losses, current assets, cash, current liabilities, industrial classifications and previous profitability.

Variability in the regression specifications across studies has been coupled with a number of conflicting results. While the importance of some function of total assets or sales as a proxy for auditing effort is unambiguously supported, there is considerable disagreement about other variables. For example, Davis, et.al. (1993) attempts to replicate results presented in Simunic (1984), Simon (1985), Palmrose (1986) and Turpen (1990). While the influence of total assets and the number of reports issued by the auditor is confirmed, the intercept is found to have more explanatory power than audit opinion type, various industry indicators, number of audit locations and whether the firm is publicly or privately held. More importantly, Davis, et.al. find no evidence to support the hypothesis that the provision of non-audit services significantly impacts audit fees. Numerous other examples of conflicting results are available, e.g., Low (1990), Palmrose (1989) and others find a strong industrial effect while Davis, et.al. find no

impact. This conflicting empirical evidence raises the possibility that the research methodology underlying many of the available studies may be inadequate. The primary implication is that incomplete or incorrect inferences have been drawn about audit fee behaviour.

Statistical inadequacies in previous studies result, primarily, from three interrelated sources: weak data; incomplete reporting of relevant testable hypotheses; and, misspecification of the estimated regression equations. While weak data is typically out the researcher's control, the absence of adequate data also restricts the ability to formulate relevant testable hypotheses or to specify appropriate regression equations. Inadequate statistical analysis will further reduce the number of correct inferences that can be drawn from the available data. For example, the cross section regression equation results typically presented involve the null hypothesis that slope and intercept coefficients are constant across firms. Relaxing this assumption to allow, say, interaction between the coefficients and the explanatory variables is difficult without information across time as well as individual firms. This shortcoming is combined, in many studies, with incomplete statistical reporting. Typical omissions include: not testing or correcting for heteroskedasticity, which is often associated with cross sectional studies; and, the related issue of not considering the possibility of data outliers.

Regarding correct regression equation specification, with few exceptions audit fee regression equations are specified with little or no attention given to the underlying production or demand relationships, O'Keefe, et.al. (1994) and Thornton and Moore (1993) are notable exceptions. Because audit fees represent the income received from the production of audit services, in a partial equilibrium setting this requires modelling both the price and output behaviour. In particular, assumptions about the elasticity of demand for audit services may impact the interpretation of statistical information on scale economies in production, e.g., Simunic (1984), Davis et.al. (1993). In turn, there may be considerable variation in the production of audit services across auditees. In this sense, audit fees are analogous to firm earnings and personal income, variables which have been intensively studied in the applied econometrics literature, e.g., Baltagi and Raj (1992). Unfortunately, the panel data set

available in this study does not permit application of the specialized econometric techniques which have been developed in this literature to control for the effects of individual heterogeneity and aid in the identification of the appropriate economic model.

STATISTICAL ESTIMATION[1]

Because the available literature on audit fees relies on cross-section analysis, there is no evidence on the time series behaviour of audit fees.[2] This study addresses this issue by using a 1986-90 sample composed of the 50 largest market capitalization, SES traded Singapore firms and a similar 50 CLOB traded Malaysian firms. In order to select the relevant firms, market capitalization is evaluated as of Dec. 31, 1991 (taken from Singapore Business Times, 2/1/92). Due to new listings, mergers and other factors, this results in some reduction in the number of sampled firms for earlier years. However, this approach has the advantage that there are no changes in the firms included in the sample from year to year. In order to assess the significance of incorporating time series behaviour, only a limited number of additional independent variables are considered, i.e., total assets, sales, previous profit performance, current assets, and industry classification. Attention centres on the differences in estimation results for changes in, as well as the level of, audit fees as the dependent variable of interest.

The availability of time series information on audit fees permits alternate regression specifications from those typically encountered in audit fee studies. In particular, changing the specification of audit fee regressions to include the lagged value of audit fees as an independent variable has theoretical as well as statistical implications. For example, in order to theoretically interpret the coefficient on lagged fees, it is possible to argue that audit fees are determined through a partial adjustment mechanism similar to that proposed by Lintner (1956) for dividends. There may be some target level of audit fees which the auditing firm would like to charge based on the fundamentals, e.g., billable hours, associated with auditing a specific firm. However, for a number of reasons, such as the audit contract type or competitive factors in the market for auditing services, large changes in the target level of auditing fees will not be fully billed. Audit fees would only partially adjust to the difference between the current and

target level of audit fees, leading to a partial adjustment process for auditing fees. Under this null hypothesis, the coefficient on lagged audit fees can provide information on the speed of adjustment to changes in the target level of fees.

Ideally, regression techniques which permit coefficients to vary over both individuals and time could be used. However, this requires longer time series than are available in the present sample. The data used in this study only permits the testing of models in which the regression slope coefficients are assumed to be constant across firms. While systematic variation in the intercept across firms could be permitted, this approach is only partially implemented by using dummy variables for selected firms. Some attention is given to simple specification tests for measurement error in the dependent and independent variables. In previous studies, measurement error in the independent variables is inherent in the reliance on either total assets or sales as a measure of the effort and complexity involved in an audit. At best, these proxies represent only crude approximations for the appropriate independent variable: direct labour hours used in the audit. Proxies are used because labour hours are not directly observable. Because of the essential role played by the effort variable, evaluation of the impact of measurement error embodied in use of proxy variables is fundamental.

The identification of factors such as measurement error is intimately related to the type of regression specification selected. Ideally, variation in the slope coefficients would be permitted and the regression specification employed would be:

$$y_{i,t} = \beta_0 + \lambda_i y_{i,t-1} + \sum_{j=1}^{k} \beta_{i,j} x_{i,j,t} + u_{i,t} + \theta_i \qquad (1)$$

where i = 1,2,.....N is the index for firms, j = 1,2...k is the number of independent variables, t = 1,2....T is the index for time, $x_{i,j,t}$ is the exogenous variables and $\beta_{i,j}$ the slope coefficients for the ith firm and jth exogenous variable, $u_{i,t}$ is the equation residual for the ith firm and θ_i is an individual-specific constant for the ith firm which is fixed through time and controls for differences between individual cases. The present data restriction of few times periods and many firms, requires that the null hypothesis $\beta_{i,j} = \beta_j$ and $\lambda_i = \lambda$ be imposed across all i = {1,2,....N} firms; in effect, slope coefficients are assumed to be constant across firms leading

to the specification:

$$y_t = \beta_0 + \lambda\, y_{t-1} + \sum_{j=1}^{k} \beta_j\, x_{i,j,t} + u_{i,t} + \theta_i \qquad (2)$$

Due to the presence of time and the lagged audit fee term, this regression specification differs from previous studies on audit fees.

There are a number of problems which can arise in going from (1) to (2). If the assumptions $\beta_{i,j} = \beta_j$ and $\lambda_i = \lambda$ are incorrect, Robertson and Symons (1992) demonstrate that "this specification error can cause serious (statistical) problems, likely to be important in practice." This concern can be used to motivate a number of statistical tests to evaluate the validity of the constant slope coefficient assumption. However, because the limitations associated with this null hypothesis are a result of weak data, it is difficult to adequately address this problem with the current data set. In addition, attempts to address this issue by taking samples over longer periods encounter a number of difficulties. For example, estimation procedures which attempt to extract the additional information contained in the intertemporal relationships typically make use of an error component structure, e.g., Baltagi and Raj (1992). In panel data for audit fees across firms there are a number of reasons, e.g., mergers and acquisitions, where time series are discontinued or added. This results in pooling of cross-sections with unequal time series lengths, complicating the estimation procedure, e.g., Baltagi (1985).

While there is limited use of time series information in audit fee studies, similar samples with few time periods and many individuals (or firms) arise in wage determination studies using household data surveys. In this literature, significant differences have been observed in the adjusted R^2 and the coefficient standard errors for equations estimated in levels and changes. Hamermesh (1989) argues that, for the models where the slope coefficients are assumed equal and θ_i are included in the regression (an individual-effects model), "the poor explanatory power and large standard errors in differenced individual-effects models in most work stem from measurement error in the dependent variable". This raises the question of whether the data on audit fees used in this study are measured without error. The answer to

this question depends on the null hypothesis under consideration. For example, if external audit fees are the dependent variable of interest, it is possible that external and internal audit fees are jointly determined. Because only external audit fees are observed in this study, this raises the potential for measurement error in the dependent variable. This can create problems because, as Margheim (1986) suggests: in certain circumstances, "external auditors actually adjust the nature and extent of audit procedures due to reliance on internal auditors."

In addition to the measurement error in the dependent variable, measurement error in the independent variable may also produce significant differences between levels and first difference estimates. In this vein, Griliches and Hausman (1986), among others, demonstrate that severe biases will result from this type of measurement error when differencing methods are used in data sets combining time series and cross section information. While the behaviour of the biases between first difference and "within" level regressions can be used to deduce the validity of the model underlying the regression specification, the limited number of time series observations again makes the use of such techniques impractical with the present data set. Davidson, et.al. (1985), Cushing and McGarvey (1992) and others provide alternative motivations for the use of first differencing to test for misspecification. The theoretical upshot of this statistical approach is that consideration of first differencing results also provides information about the correct specification of the process for determining audit fees.

The technique of comparing the levels and first difference regressions can be illustrated by considering what happens in (2) when first differences are used. Evaluating (2) for the dependent variable y_{t-1} and subtracting from (2) gives:

$$\Delta y_{i,t} = \lambda \Delta y_{i,t-1} + \sum_{j=1}^{k} \beta_j \Delta x_{i,j,t} + \Delta u_{t,i} \qquad (3)$$

The individual specific constants or "fixed effects", which are assumed to be fixed through time, are eliminated, the constant term goes to zero and the coefficients on the independent variables are unchanged. This specification can be compared with (2) when the condition $\lambda = 1$ is imposed:

$$\Delta y_{i,t} = \beta_0 + \sum_{j=1}^{k} \beta_j x_{i,j,t} + u_{i,t} + \theta_i \qquad (4)$$

It is also possible to consider alternative specifications of audit fees formulated using first differences as the dependent variable:

$$\Delta y_{i,t} = \beta_0 + \beta_{k+1} \Delta y_{i,t-1} + \sum_{j=1}^{k} \beta_j x_{i,j,t} + u_{i,t} + \theta_i \qquad (5)$$

Because each of these specifications has a different theoretical implication, testing for differences in the associated regression estimates can provide important information about the process by which audit fees are determined.

The importance of first differencing as a test of specification can be illustrated by considering the relationship between (2) and a general specification of conventional audit fee regressions:

$$y_{i,t} = \beta_0 + \sum_{j=1}^{k} \beta_j x_{i,j,t} + u_{i,t} + \theta_i \qquad (6)$$

Assuming that (2) is the correct null hypothesis, manipulating (2) using the lag operator L leads to the regression specification:

$$y_{i,t} = \gamma_0 + \sum_{j=1}^{k} \beta_j \frac{x_{i,j,t}}{[I - \lambda L]} + \frac{u_{i,t}}{[I - \lambda L]} + \gamma_i \qquad (7)$$

Estimating (6) instead of (7) or (2) will almost surely lead to incorrect estimates of the true β_j. Because the important $x_{i,j,t}$ in audit fee regressions such as assets and sales are typically autoregressive, coefficient estimates from (6) may appear reasonable. However, when the coefficient estimates from first differencing (6) are examined:

$$\Delta y_{i,t} = \sum_{j=1}^{k} \beta_j \Delta x_{i,j,t} + \Delta u_{i,t} \qquad (8)$$

there will be substantial variation in the β_j indicating that (6) is not a correct null hypothesis.

EMPIRICAL RESULTS

General features of the dependent and independent variables contained in the sample under

consideration are provided in Table 1. The dependent variable, audit fees, is similar across both Singaporean and Malaysian firms at around S$350,000 when all firms are included. Taking the ratio of audit fees to total assets, 335/3,068K for Singapore and 350/2,170K for Malaysia, the level of fees charged in Singapore and Malaysia is relatively less than that for UK firms reported by Pong and Whittington (1994), 405/509K. Measures of firm size for both countries, total assets, current assets and sales, indicate that the average firm size is large with significant variation in the size of firms included in the sample. For example, the smallest Malaysian firm has total assets of just over S$75 million while the largest has total assets of almost S$31 billion. The exclusion of banks and, in the case of Malaysia, Sime Darby had a substantial impact on the asset measures for both countries while having almost no impact on the profit and sales measures. All Singaporean firms and almost all Malaysian firms reported positive profits.

While the level variables exhibit a decided similarity between Singaporean and Malaysian firms, the 1989 to 1990 changes in the audit fee dependent variable exhibit substantial variation. The relative average increase in Singaporean fees, 27/355, is much less than for the Malaysian firms, 68/350. This relative discrepancy is not changed when banks and Sime Darby are excluded from the sample, with Malaysian results changing to 41/237 and Singaporean results of 23/294. Despite this, the ratio of average change to standard deviation of the change is much higher for the Singaporean firms. Relative differences in the size and profit variables are less substantial. For example, the relative change in total assets is 344/2170 for Malaysian firms and 548/3068 for Singaporean firms. Results for current assets and profits are similar with some discrepancy for relative sales with Malaysian firms at 150/698 and Singaporean firms at 76/492. Exclusion of banks and Sime Darby has virtually no impact on the Singaporean results and some impact on Malaysian firms, primarily due to exclusion of the largest capitalization firm Sime Darby (a non-bank).

Regarding the type of auditing firms involved, while the "Big Six" accounting firms predominated in both the Malaysian and Singapore samples, this feature was more prevalent among the Singapore firms (47/50 vs. 40/48). Similar results apply for the number of auditor

changes over the 1986-91 sample: only 4 changes were observed for the Singapore firms while there were 7 changes for Malaysian firms (see Appendix). These changes were roughly divided between: changes from non-Big Six to Big Six; and, changes between the Big Six. No changes from Big Six to non-Big Six were observed. While the small number of auditor changes rules out the inclusion of an auditor change variable in the regression analyses, it is possible to make some heuristic inferences. This frequency of auditor changes, 11 out of 348 possible cases with more changes in Malaysia than Singapore, is approximately the same as reported for the sample of large listed UK firms in Pong and Whittington (1994) and significantly less than the frequency for listed Western Australian firms in Butterworth and Houghton (1995) which were typically smaller in size.[3] This evidence suggests that demand for auditing services may be relatively inelastic for larger listed firms when compared with smaller listed firms.

While there are a number of studies indicating price competition in the market for audit services, e.g., Roberts, et.al. (1990), for the present sample price competition appears to have been insufficient to generate a significant number of auditor changes. This can, at least partly, be attributed to the influence of non-price factors on auditor selection for large firms. The tenure of the relationship between large client and auditor can involve a range of non-audit accounting services such as tax planning and management advisory services. There can be sizable fixed costs which a new accounting firm would have to incur in order to acquire the necessary familiarity with the business activities of a large client. There may also be institutional factors specific to the countries under consideration coming into play. For example, favourable audit pricing by incumbent auditors is reinforced by lower audit production costs resulting from: the strict listing requirements for publicly traded companies on the SES producing largely high quality auditees; and, the local tax systems excluding a number of sources of income, such as capital gains, from taxation, reducing required effort.

The absence of a significant number of auditor changes raises indirect questions about the validity of focusing solely on the production relationships involved in producing audits as the determinant of audit fees for large firms. In a given year, audit firms may not charge fees that

fully reflect the cost of audit effort involved. Following Palmrose (1989), this could occur because the audit contract type may put explicit or implicit restrictions on the audit fee which can be charged. No information is available on the audit contract types for the firms in the present sample. In addition, where a bundle of accounting services are provided to a specific client, unanticipated audit costs could be recaptured in the billing for other services. Hence, even if data on audit contract type were available, it is not clear that this would provide sufficient information. The absence of a precise connection between audit effort and audit fees substantively complicates the problem of specifying a functional relationship between the (unobserved) auditing effort required and the available proxy variables. In turn, casual analysis suggests that there will also be substantive differences between industries in the relationship between total assets, sales and auditing effort.

The firms included in this sample cover a range of industry types. The Singapore sample includes finance, property, industrial/commercial, and hotels companies. The Malaysian sample includes these industry types, with the addition of mining and plantation companies. As illustrated in Table 1, of these industry types, financial companies, especially the banks, exhibit a distinctly different total asset behaviour compared to other industry types. This is due to the substantially larger total assets possessed by banks compared to the audit fees incurred. Well developed systems of internal control and internal auditing effort means that external audit fees for banks will be small relative to asset size. In addition, it is difficult to define gross sales for banks. In the absence of a better measure of sales for banks, gross profit was used. Under appropriate assumptions, this potentially anomalous behaviour for banks provides a motivation for the use of bank-specific effects, θ_i, in estimating (2).

In addition to fixed effects generated by the atypical relationship between sales, assets and audit fees for banks, adjustments were made for two other firm specific individual effects which were observed. Specifically, one Singaporean firm, Times Publishing, generated significantly larger audit fees than indicated by the firm's ranking (41). The largest discrepancy was observed in the first year's audit fee after Times Publishing had gone public. The other outlier in the data was the largest market capitalization Malaysian firm, Sime Darby,

which had significantly larger audit fees than indicated by the size of the firm's assets. The presence of outliers in the data raises substantive statistical issues. Handling the outliers by including dummy variables in the regressions will be incorrect if the outliers cannot be modelled with intercept shifts alone, e.g., if the slope coefficients are also affected. In addition, the inclusion of these types of dummies may undermine using dummy variables for other purposes. Dropping observations is an alternative approach which may also have limitations such as loss of information and sample selection bias. Because of these problems, a number of different regression specifications were estimated.

To provide a benchmark for assessing audit fee regressions which contain a lagged dependent variable, Tables 2 and 3 provide results for a number of regression specifications where the lagged audit fee has been omitted.[4] These results are generally consistent with results for similar regressions reported in other studies: size related variables, either the square root of total assets or the level of current assets, have highly significant coefficients in both the Singaporean and Malaysian regressions. While almost all the R^2 values are highly significant in both Tables 2 and 3, the Malaysian regressions had substantially better fits. In the Singaporean case, the coefficients for total sales (also a size variable) and profits are also usually significant, though this is not reflected in the Malaysian results, possibly due to multicollinearity with the Sime Darby dummy variable. For both countries, the most significant coefficient appeared on a firm specific dummy, Times Publishing for Singapore and Sime Darby for Malaysia. The bank dummy variable was usually insignificant for both countries.

Results for the audit fee level regressions for Singapore and Malaysia which do contain the lagged value of the audit fee are reported in Tables 4 and 5, respectively. In almost all regressions for both countries, the coefficient on the lagged audit fee is the most significant of all the variables included. The importance of the lagged audit fee relative to either the asset variables or sales is apparent. The inclusion of lagged fees significantly reduces the statistical contribution of the conventional proxies for auditing effort, as well as producing noticeable changes in the size of the coefficients.[5] The most significant coefficients in Tables 2 and 3,

for the firm specific dummies, are now either less significant or insignificant; though the coefficient for the Times Publishing dummy still continues to exhibit substantial explanatory power. Recalculating the t-tests to evaluate whether the estimated coefficients for lagged fees are equal to one, consistent with the hypothesis that audit fees follow a random walk, results in a rejection of this null hypothesis. Following the discussion in the previous section, the information provided by the coefficient on the lagged audit fee has important theoretical implications for the conventional models of how audit fees are determined.

Tables 6 and 7 provide the Singaporean and Malaysian results for (3)-(4) and Tables 8 and 9 the results for (5) and (8), regressions where the first differenced audit fee is the dependent variable. Bank dummies were not included because these variables were usually insignificant in the regressions for audit fee levels. Times Publishing and one other firm, Singapore Press Holdings (SPH), were censored from the Singaporean sample because of difficulties associated with the three year period required for the relevant differences. A number of observations are apparent. Compared to the levels case, a substantial reduction in the R^2 is evident for all cases. The erratic behaviour of the coefficient on the lagged fee difference estimated from the Singaporean sample is in marked contrast to the more stable, though not statistically significant, coefficient estimated from Malaysian data. This suggests that there may be different factors driving changes in fees in the two samples. It is also possible that while the process generating fees may be the same the assumption that $\lambda_i = \lambda$ is incorrect. This could be due to different audit contract types being used across firms. In any event, the difference in the lagged fee coefficients in Tables 4-5 and 6-7 provides considerable evidence against (2) as a valid specification.

Comparison of the results in Tables 6-9 with Tables 2-5 provides other information about the validity of the various possible specifications for audit fee regressions. While it is difficult to make precise inferences due to the impact of specific extreme observations such as Times Publishing, SPH and Sime Darby, some tentative conclusions are possible. For example, as with the results for the coefficient on lagged fees, there appears to be substantive differences between the Singaporean and Malaysian cases. While comparison of the Singaporean

coefficient results in Tables 2 and 8 would give guarded support for conventional audit fee regression specifications, this is not confirmed for the Malaysian case in Tables 3 and 9. Similarly, the significant coefficient on the lagged audit fee difference in the 1990 results for Table 8 undermines (4) as a potential specification, even though the 1989 Singaporean results and the Malaysian results would tend to support this model. The erratic behaviour of the coefficient on the lagged audit fee difference in Table 8 undermines the validity of (5) as a general specification for audit fees.

CONCLUSIONS

This study has extended previous work on audit fees by examining a data set derived from a 1986-1990 sample of Singaporean and Malaysian firms which were publicly traded on the Stock Exchange of Singapore (SES). The availability of time series as well as cross section information in the data set permits lagged audit fee information to be incorporated in the statistical analysis. The regression estimates reveal a number of useful results. Using the level of audit fees as the dependent variable, for both Singaporean and Malaysian firms lagged audit fees are found to have the most significant coefficient of all variables included in the regression. The proxy measures for auditing effort conventionally used in other studies, asset measures or total sales, are found to be generally insignificant when lagged audit fees are included in the regression. Previous profit performance was also found to have insignificant coefficients. The only other variables found to be generally significant are firm specific dummy variables included to account for data outliers. This evidence about the importance of lagged audit fees has potentially significant implications for interpreting the results from previous studies on audit fees.

Previous studies on audit fees have typically taken a 'cost-plus' interpretation of audit fee determination: audit fees are primarily determined by auditing effort, with appropriate adjustment for specific factors which can affect effort such as client complexity and the provision of other client accounting services. Because auditing effort is not usually observable, regression specifications are motivated by using proxy variables, almost always related to

client size, such as total assets. The use of cross section data to estimate regressions requires the further assumption that the slope coefficients do not vary across firms. In addition, cross section data only permits the audit fee level to be used as a dependent variable. Estimated regression specifications are often motivated in an ad hoc fashion without directly modelling either the demand for audit services or the relevant production relationships. One important feature which is often ignored is the audit contract type which could prevent large changes in audit fees from being fully billed in a given year.

Results from regressions involving the change in audit fees as the dependent variable were used to assess the validity of various regression specifications involving audit fee levels as the dependent variables. These estimated regressions produced mixed results, primarily due to significant differences between Malaysian and Singaporean firms. For example, when the coefficient on the previous change in fees was of interest, the Malaysian results produced 'well behaved', though typically insignificant, coefficient estimates with erratic and sometimes significant coefficient estimates being observed for the Singaporean sample. Similar differences across results for the two countries were observed for all the regression specifications examined. As a consequence, there is only limited support for either conventional audit fee level regression specifications or other specifications which also involve lagged fees. It is possible that this is because the cross section assumption of constant slope coefficients across firms is invalid. Unfortunately, further investigation of this conjecture requires a larger panel data set involving substantially longer time series.

TABLE 4*

Selected regression results for the level of Singaporean audit fees Including Lagged Dependent Variables

	Sample											
	1990	1990	1990	1990	1989	1989	1989	1988	1988	1988	1987	
# of Obs.	(50)	(50)	(50)	(50)	(43)	(43)	(43)	(42)	(42)	(42)	(39)	
Constant	38.3	- 2.93	19.5	-.16	40.8	0.18	3.49	31.1	19.4	28.9	5.59	
	(1.73)	(.29)	(2.63)	(.01)	(.92)	(.01)	(.13)	(3.03)	(2.19)	(3.55)	(.25)	
Audit Fees(-1)	.931	1.06	1.06	1.04	.851	.651	.613	.934	.910	.898	1.13	
	(8.9)	(27.4)	(21.2)	(22.9)	(3.83)	(2.55)	(2.31)	(22.1)	(21.2)	(23.6)	(10.1)	
Sales	.0230				.0186			-.0021				
	(2.11)				(.83)			(.43)				
Sq.Rt. Sales		.040					.122			.021		-.018
		(2.37)					(1.39)			(1.20)		(.26)
Assets			.0022							.0058		
			(.78)									(2.50)
Sq. Rt. Assets				.029			.084					
				(1.81)			(1.28)					
Bank Dummy	-8.85	-45.1	-76.9		202.3	7.88		46.8	-1.34	-29.2		
	(.30)	(1.42)	(2.14)		(1.36)	(.12)		(1.45)	(.074)	(.52)		
Times Publ. Dummy	-703.3	-695.5	-659.3		720.2	790.1						
	(11.9)	(9.15)	(9.51)		(2.78)	(2.75)						
R^2	.92	.97	.97	.98	.73	.81	.82	.98	.98	.98	.93	

* Standard errors, variances and related parameters are calculated using heteroskedastic-consistent estimators. Numbers in brackets below coefficient estimates are the absolute values of the t statistics for the null hypothesis that the coefficient is equal to zero. Fees and assets recorded in S$ '000's, with the exception that coefficients on the **level** of assets and sales are scaled up to S$ '000,000.

TABLE 5*

Selected regression results for the level of Malaysian audit fees Including Lagged Dependent Variables

	Sample											
	1990	1990	1990	1990	1989	1989	1989	1988	1988	1988	1987	
# of Obs.	(48)	(48)	(48)	(48)	(43)	(43)	(43)	(43)	(43)	(43)	(40)	
Constant	47.8	20.0	24.2	50.2	11.1	1.90	20.6	-33.1	-25.8	-13.5	-30.9	
	(1.46)	(.83)	(1.41)	(1.41)	(.74)	(.05)	(1.41)	(2.75)	(1.71)	(1.28)	(2.40)	
Audit Fees(-1)	1.11	1.09	1.12	1.12	1.045	1.06	1.07	.963	1.02	1.04	1.05	
	(45.2)	(44.4)	(103)	(57.2)	(34.9)	(42.5)	(68.1)	(30.3)	(32.2)	(30.2)	(28.6)	
Sales	-.01501				.02786			.0856			.0451+	
	(0.75)				(1.19)			(3.66)			(1.54)	
Sq.Rt. Sales		41.3				.03			.029			
		(.12)				(.76)			(1.08)			
Assets			-.00597				.00006			.00049		
			(1.10)					(.51)				(.30)
Sq. Rt. Assets				-.03								
				(.90)								
Bank Dummy		119.9	151.8	151.7		-1.78	-19.2	51.7	26.8	15.1	43.1	
		(1.35)	(1.32)	(1.28)		(.06)	(1.18)	(2.88)	(1.84)	(1.15)	(2.34)	
R^2	.94	.94	.94	.94	.98	.98	.98	.99	.98	.98	.99	

* See notes to Table 1.

TABLE 3*

Selected regression results for the first difference in the level of Singaporean and Malaysian audit fees

	Sample					
	1990S	1990M	1989S	1989M	1988S	1988M
# of Obs.	(43)	(43)	(42)	(43)	(39)	(41)
Constant	7.10	33.0	-30.7	32.9	12.2	1.81
	(.37)	(1.54)	(1.03)	(2.62)	(1.63)	(.25)
Δ Audit Fees(-1)	-.15	.47	2.12	.349	-.245	.376
	(1.47)	(1.24)	(1.66)	(2.10)	(1.30)	(2.03)
Δ Sales	.3862	.03688	.0073	.06154	.1356	.3789
	(2.34)	(.40)	(0.4)	(.81)	(1.36)	(2.78)
R^2	.12	.14	.40	.14	.17	.55

* For the samples, e.g., 1990S, S or M indicates Singapore or Malaysia. Also see notes to Table 1.

APPENDIX[1]

Singapore Companies Included in the Sample

Company Name	Ranking '92	Auditors '92
Amcol	42	BDO Binder
Asia Pacific	13	Ernst Young
BAT	39	Price Waterhouse*
Cycle and Carriage	17	Price Waterhouse
Centrepoint	36	Ernst Young
Cerebos	23	Price Waterhouse
City Developments	7	KPMG Peat Marwick
DBS	2	Price Waterhouse
DBS Land	8	Price Waterhouse
F and N	10	Ernst Young
Fels	22	Deloitte and Touche
GE Life	31	Ernst Young
Goodwood Park	26	Coopers and Lybrand
H. Leong Fin.	40	KPMG Peat Marwick
H. Plaza	45	Coopers and Lybrand
Hai Sun Hup	48	Price Waterhouse
Haw Par	46	Ernst and Young
Hotel Properties	30	Deloitte Touche
Inchcape	29	Coopers and Lybrand*
Jurong Ship	16	Evans, Wong and Co.
Keppel Corp.	5	Price Waterhouse
Malaysian Credit	33	Deloitte, Haskins and S.*
Marco Polo	43	KPMG Peat Marwick
NatSteel	18	Price Waterhouse
NOL	28	Price Waterhouse
OCBC	3	Price Waterhouse
OUB	11	Coopers Lybrand
OUE	15	Coopers Lybrand
Parkway Hldgs.	44	KPMG Peat Marwick
PCL	38	Foo, Kon and Tan
Rothmans Ind.	25	KPMG Peat Marwick
S. Aerospace	24	Price Waterhouse
S. Steamship	21	Ernst and Young
Semb. Shipyard	9	Price Waterhouse
Shangri-La	20	Coopers Lybrand*
SIA	1	Ernst and Young
Sime S'pore	35	Price Waterhouse
Singmarine	34	Deloitte Touche
SPC	14	Price Waterhouse

Malaysian Companies Included in the Sample

Company Name	Ranking '92	Auditors '92
Sime Darby	1	Price Waterhouse
MISC (Mulpha Int.)	2	Ernst and Young
Gentings	3	Kassim, Chan and Co.
M. Banking	4	Salleh, Leong, Azian
Rothmans	5	KPMG Peat Marwick
MAS	6	
Shell	7	Price Waterhouse
Golden Hope	8	Ernst and Winney
Perlis Plant	9	Othman, Hew and Co.
Tan Chong	10	KPMG Peat Marwick
Public Bank	11	Hanafiah, Rasian and Mhmd.
Renong Bhd.	12	Arthur Young
Esso	13	Price Waterhouse
Mui	14	Ernst and Young
Magnum Corp.	15	Ernst and Young
Amal Steel	16	Ernst and Young*
KL Kepong	17	KPMG Peat Marwick
Cons. Plant	18	Price Waterhouse
Gunness	19	Price Waterhouse
Sime UEP Prop.	20	Price Waterhouse
Hume M.	21	KPMG Peat Marwick
Tractors	22	Price Waterhouse
H. Leong Ind.	23	Ling Kam Hoong and Co.
MMC	24	KPMG Peat Marwick
Oriental Hldgs.	25	KPMG Peat Marwick*
Multi-Purpose	26	Ernst and Young
D and C Bank	27	Arthur Anderson*
MTC	28	Price Waterhouse*
NST	29	Price Waterhouse*
High and Low	30	KPMG Peat Marwick
Faber Group	31	Hanafiah, Rasian and Mhmd.
UMW	32	Hanafiah, Rasian and Mhmd.
M. Cement	33	Coopers and Lybrand
Landmarks Bhd.	34	KPMG Peat Marwick*
IGB Corp.	35	Coopers Lybrand
Berjaya Leisure	36	---
Leader U.	37	---
MB Finance	38	Hanafiah, Rasian and Mhmd.
Tasek Cement	39	KPMG Peat Marwick

[1] Ranking of firms is by market capitalization as of Dec. 31, 1991 as reported in the Singapore Business Times, Thursday, Jan. 2, 1992. An asterisk (*) indicates that there was a change of auditors over the period 1986-91. Two Malaysian firms, Berjaya Leisure and Leader U., were excluded due to lack of data. Information on auditors taken from the SES Companies Handbook.

APPENDIX (cont'd)

Singapore Companies Included in the Sample

Company Name	Ranking '92	Auditors '92
SPH	6	Coopers Lybrand
S'pore Bus	47	Deloitte Touche
S'pore Land	12	Price Waterhouse
SSE	50	KPMG Peat Marwick
Straits Trading	27	Ernst and Young
Tat Lee Bank	37	KPMG Peat Marwick
Times Pub.	41	KPMG Peat Marwick
UIC	19	Ernst and Young
UOB	4	Coopers and Lybrand
UOL	32	Coopers and Lybrand
Wearnes	49	Price Waterhouse

Malaysian Companies Included in the Sample

Company Name	Ranking '92	Auditors '92
Dunlop Est.	40	Ernst and Young
H. Leong Credit	41	Ling Kam Hoong and Co.
Bedford	42	Ernst and Young
Land and Gen.	43	Price Waterhouse
Metroplex	44	PC Chan and Partners
Kamunting	45	Ernst and Young
Rashid Hussan	46	Monterio and Heng
Ind. Oxygen	47	BDO Binder
AMDB	48	Yeo Young Poh and Co.
Berjaya Ind.	49	Price Waterhouse*
Pelangi Bhd.	50	Hanafiah, Rasian and Mhmd.

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NOTES

1. **The Appendix contains a listing of the SES and CLOB firms examined.**

2. Even when time series information is available, e.g, Davis et.al. (1993) or Pong and Whittington (1994), the time series properties of audit fees are ignored. Some studies such as Butterworth and Houghton (1995) explicitly avoid the time series information to "avoid the econometric problems which could be caused by pooling observations across time." (p.329)

3. Butterworth and Houghton (1995) report 37 auditor changes for the 268 firms observed over 2 years examined while Pong and Whittington (1994) report 82 changes out of 2792 possible changes over 7 years examined. While Pong and Whittington (p.1090) report a lower frequency (82 out of 3349) it appears that no auditor changes were associated with the first year observed, requiring those 557 cases to be deleted in calculating the frequency.

4. Various other regression specifications were also examined which produced results which were similar to those reported. The following variations in specifications were examined: log transforming audit fees, sales and total assets; using the lagged value of total assets or sales, in place of the contemporaneous value; and, additional dummies for other specific firms, e.g., Esso for Malaysia. While there were a number of exceptions, the use of censoring techniques also did not typically alter the results significantly.

5. Also of interest is the joint hypothesis that the coefficients on lagged fees are equal over time. To test this hypothesis, models were estimated using seemingly unrelated regressions. (These results are not reported.) For various specifications of the regression equation, the null hypothesis of equal coefficients was narrowly rejected for both the Singaporean and the Malaysian data. Another significant result which is not reported concerns the 1989 Singaporean results in Table 4. The relatively low coefficient on the lagged audit fee in these two regressions is changed substantially when SPH is censored from the sample. This firm had a substantial drop in audit fees in that year. Estimates for the censored sample produces coefficients on the lagged audit fee of 1.08 and 1.10, respectively, with t-values in excess of 20.