Documento de Trabajo 09/01

Detecting earnings management in a Spanish context

María del Mar Delgado
Luis Castrillo Lara
Universidad de Burgos

ABSTRACT

The aim of this study is to examine whether different accrual models detect earnings management in a sample of Spanish firms that have received GAAP audit qualifications.

The unexpected accruals obtained from the Jones model, the modified Jones model, the Jones working capital model and the modified Jones working capital model are significantly positive, supporting the hypothesis that earnings have been managed upwards. However, the unexpected accruals obtained from the margin model are not significantly positive. We should be cautious in the interpretation of these results because of the almost certainly bias towards the inclusions of the most obvious and spectacular cases of earnings management. Potential extreme financial performance bias can not be ruled out as explanation for these results. An important limitation of this paper is the reduced number of firms that constitutes the estimation sample and also the prediction sample.

Keywords: earnings management, accruals, accrual models, GAAP audit qualification.

1. INTRODUCTION

The measurement of accruals plays an important role in accounting literature. This wide body of literature includes studies on the prediction of future cash flows, the market´ s pricing and value relevance of accruals versus cash flows (Bath et al. ,1999; Pfeiffer et al., 1998; Dechow, 1994), tests of earnings management where there is a firm-specific event or a multiperiod strategic approach (Healy, 1985; DeAngelo, 1986, 1988), McNichols et al., 1988; Jones, 1991; DeFond et al., 1994; DeFond et al., 1998; McCulloch, 1998; Erikson et al., 1999), and market´s pricing of discretionary accruals versus non - discretionary accruals (Subramanyam, 1996; Press et al., 1998). The focus of this paper is the performance of different accrual models in testing earnings management (hereafter EM).

Shipper (1989) defines EM as a purposeful intervention in the external financial reporting process, with the intention of obtaining some private gain, as opposed to a neutral participation. Some restriction on manager discretion over accounting and other policies is expected, but some discretion will remain[1]. Shipper (1999) has since proposed a modification to the definition that identifies EM as " implementation that impairs an element of decision usefulness or implementation that is inconsistent with the intent of the standards".

Another interesting definition of earnings management is provided by Healy et al. (1999). EM occurs when managers use judgement in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers[2]. Dechow et al. (2000) analyse different perceptions academics, practitioners and regulators have of EM.

The problem researchers find when explaining accounting policy is that managers have an informational advantage over researchers as well as incentive to camouflage EM. Discretion exercised over accounting policy cannot be directly observed. Different accrual models, through the estimation of what is

[1] Positive accounting theory provides an interesting framework where the existence of accounting discretion can be explained. Even though contracts that use accounting numbers to align managers and contracting parties´ interests would not be effective if managers had complete discretion over the reported accounting numbers, managers are likely to know best which accounting procedures are optimal from the point of view of all claimants, so some discretion will remain.

[2] The use of accounting judgement to make financial reports more informative does not fall within this definition.

called "non - discretionary, expected or normal accruals"[3], provide earnings management investigation with a benchmark for the exercise of accounting discretion. So, the goal of these models is to separate total accruals into discretionary and non discretionary components.

How well do "these models" work? This is a question that has been addressed in several studies. In a market- based evaluation context, Guay et al (1996) present evidence consistent with "considerable imprecision and / or misspecification " in existing actual models. New models or modification of existing ones are often introduced by the improvements they make at generating type I errors and type II errors[4]. The specification of the test statistic is evaluated by examining the frequency with which they generate type I errors in a randomly selected sample of firm years. The power of the test statistic is evaluated by examining the frequency with which they generate type II errors in a sample of firm years in which the researchers have artificially added a fixed and known amount of accruals to each firm - year[5].

The general finding of this evaluation is that the power of tests is low for EM of economically plausible magnitudes and that the models produce reasonably well specified tests for a random sample of event-years. When models are applied to test firm years experiencing extreme financial performance, the models lead to misspecified tests (Dechow et al., 1995)[6]. This misspecification arises because the magnitude of normal accruals is correlated with past and current performance. This dependence occurs because firm performance conditional on past performance does not follow a random walk and because both operating accruals and operating cash flows are strongly mean reverting (Kothari, 2000).

In testing the power of various models, Kang (1999) points out that even though simulation results are informative, there is no guarantee that accrual behaviour of simulated data is reflective of real EM. Dechow et al. (1995) and Kang (1999) evaluate the relative performance of different models in detecting EM on a sample of firms for which they have strong prior beliefs that earnings have been managed. These samples consists of firms that have been targeted by the

[3] Due to the fact that the accrual models are really expectations models, Healy (1996) proposed a renaming of some terms: "unexpected accruals" for "discretionary accruals" and "unexpected earnings " for "discretionary earnings".

[4] Dechow et al. (1995) and Kang et al. (1995) evaluate time - series models , and Jeter et al. (1999) and Peasnell et al. (2000) evaluate cross - sectional models.

[5] These simulations are similar to those performed by Brown and Warner (1985) in evaluating alternative models for detecting abnormal stock price performance.

[6] In the same way, Jeter et al. (1999) find evidence that the cross - sectional Jones model is misspecified for firms whose cash flows deviate systematically from the industry median. However, extending the Jones Model to explicitly control for cash flow from operations Jeter et al. (1999) show that the cash flow model is well specified for all cash flow levels.

Securities and Exchange Commission (SEC) for allegedly overstating annual earnings and firms suspected of earnings management to avoid losses[7].

The objective of this study is to test whether different cross sectional models detect earnings management in a sample of firms suspected of having managed earnings. This sample consists of firms that have received audit qualification for GAAP violation in Spain from 1991 to 1998. Our research is based on two assumptions. The first is that auditors have correctly identify firms that violate GAAP. And the second assumption is that these firms have first employed the maximum discretion allowed within GAAP before using other accounting procedures outside GAAP.

The economic determinants and the governance structure are key factors for explaining the different accounting policies followed by firms. We are not going to consider those factors that generate incentives and limitations to the exercise of accounting discretion. Although we think they are very important, the focus of this paper is limited to providing additional evidence on whether different accrual models detect EM when it does really exist.

The average standardised prediction error is significantly positive for all models except for the margin model, supporting the hypothesis that earnings have been managed upwards. Although these results could serve as evidence on the performance of alternative models measuring discretionary accruals in our Spanish context, we should take into consideration when interpreting these results that the prediction sample includes the more obvious and spectacular cases of earnings management.

The remainder of the paper is organised as follows. The following section offers a conceptual revision of existing models for testing EM. Firm sample is described in section three. The results obtained are presented in section four and section five provides the conclusion of the paper.

SECTION 2. ACCRUAL MODELS IN DETECTING EARNINGS MANAGEMENT

Researchers interested in testing whether firms use discretionary accruals (hereafter DA) to manage earnings must select a proxy for DA and they must isolate situations (the event) where the direction of EM can be predicted (McNichols et al., 1988). Although the ability of models to detect multi - period EM is still an open issue (Kang, 1999), it is important to consider that the use of accrual methology for detecting event-specific EM is just a part of its applications. Accrual models have been used in tests of contracting and political

[7] Burgstahler et al. (1997) find evidence of earnings management to avoid losses using a different methodology.

cost incentives to manipulate accounting numbers, in tests of the efficient contracting and opportunism hypothesis by correlating earnings with stock returns[8] and, in tests of the joint hypothesis of market inefficiency and accrual manipulation with capital market motivation[9].

In the first part of this section we present discretionary accruals (hereafter DA) as a measure of the exercise of accounting discretion by managers in order to alter the reported earnings (section 2.1.). As not all accrual decisions represent cases of EM and as the discretionary exercise of accrual activity is not directly observable by the researcher, they have to break down total accruals (hereafter TA) into discretionary and non- discretionary elements. The discretionary component is estimated by the difference between total accruals and the non - discretionary accruals estimation from an expectation model (hereafter NDA). This discretionary component will proxy for the real discretionary accruals (section 2.2.). In section 2.3. we analyse conceptual differences between time series and cross sectional models. We will finish this section by summing up some statistical issues in regression analysis in order to better understand some problems on inferences concerning EM.

2.1 Measures of earnings management

Managers attempting to arrive at a desired level of earnings, motivated from event period or multiperiod incentives, can choose from a large set of manipulation methods. Some of them may involve real decisions (i.e., operating, financing and investment decisions) and some are pure accounting decisions (change in useful life of fixed assets, change in policy regarding capitalizing - expensing repairs, changes in depreciation method). In some cases, manipulation may be accomplished by a combination of a real decision and an accounting decision (Jiambalvo 1996).

Once different ways used by managers for EM have been identified, the next step is to find a proxy for measuring the discretion exercised by them. An important issue is whether the discretion has been within GAAP or outside them. In terms of GAAP choices, the first proxy for the exercise of accounting policy discretion used in this research were accounting method choices or changes in accounting method choices. Zmijewski et al. (1981) adopted what they called "the income strategy approach" creating an EM weighted measure from different accounting methods, trying to control for the portfolio nature of income determination (Watts and Zimmerman,1990).

[8] In these studies market efficiency is a maintained hypothesis.
[9] See Kothari (2000) for more details of these three streams of research where accrual models have been used.

The use of operating total accruals, rather than specific accounting methods to proxy for EM constitutes a great step forward in the EM literature. Healy (1985) broke down earnings into cash flow from operations and TA, paying special attention to the fact that accruals modify the timing of reported earnings, so that it enables the manager to transfer earnings between periods. This author suggests that it is more costly and more visible for managers to transfer earnings between periods by changing accounting procedures than by changing accruals. Moreover, managers appear to have greater flexibility to change accruals. Another important feature of this measure is that it aggregates into a single number the net effect of numerous recognition decisions, thereby takes into consideration the portfolio nature of income determination as Zmijewiski et al. (1981) hoped to do. However, accrual analysis constitutes a more comprehensive measure in the sense that this measure includes both the effect of accounting method choices and operating, financial and investment decisions insofar as they affect accruals.

Manipulation outside of GAAP has been investigated in some studies. The samples used in these studies consisted of firms subject to accounting enforcement action by the SEC for alleged violation of GAAP (Dechow et al., 1995, 1996; Beneish, 1997), firms that corrected overstating earnings in previous financial statements (DeFond et al., 1991) or firms that disagreed with their auditors over the use of income increasing accounting choices (DeFond, 1993).

The sample used in this paper consists of firms that have received audit qualifications for GAAP violations. This sample is designed to provide additional insight into the detection of EM by different accrual models.

Operating total accruals, defined as the difference between operating earnings and Cash Flow from operations, does not necessarily include EM outside GAAP. So, unless GAAP violations affect one of these components, TA will remain unaffected. Even if operating total accruals includes some accruals derived from GAAP violations, this is not the main focus of our investigation. An implicit assumption made in this study is that managers of firms which exercised accounting discretion outside GAAP, would have first used the maximum discretion allowed within GAAP.

Unexpected accruals, defined as the prediction error from different accrual models, will proxy for EM obtained through the discretionary application of accruals. These abnormal accruals are hypothesised to be positive if accrual models have correctly separated TA into discretionary and non discretionary accruals.

2.2. Accrual prediction models

The proxy for discretionary accruals is obtained after subtracting non - discretionary accrual estimation from total accruals[10]. The parameters that shape the NDA model are estimated through an "estimation period" during which no systematic earnings management is predicted in time series accrual models, or through the use of "an estimation sample " from the same industry and year, providing a benchmark for the exercise of accounting discretion.

The following models range from simple models in which DA are measured as TA, to more sophisticated models that attempt to control for economic circumstances, correlation structures of accruals and cash flows or statistical issues.

2.2.1. The Healy Model

Healy (1985) tests EM comparing mean TA across different firms samples. His partitioning variables divide the sample into different groups with earnings predicted to be managed upwards or downwards. Inferences in EM are made through pairwise comparisons of the mean TA. This approach is equivalent to treating the mean accruals of a sample as the estimation period and the other as the event period.

$$NDA_\tau = \frac{\sum_t TA_t}{T}$$

where,

NDA = estimated nondiscretionary accruals;

TA = total accruals scaled by lagged total assets;

t = 1,2,… T is a year subscript for years included in the estimation period; and

τ = a year subscript indicating a year in the event period.

2.2.2. DeAngelo Model

Last period total accruals is the measure of NDA in this model. In contrast to the following models, the Healy model and the DeAngelo use TA from the estimation period to proxy for NDA, without taking into account the response of normal accruals to changes in economic circumstances.

[10] In order to make the nomenclature used in this paper simpler, we do not differentiate either discretionary accruals from discretionary accruals proxy, or non - discretionary accruals from non discretionary accruals estimation although it is important to know that researchers will never work with the real discretionary and non-discretionary accruals because they are not observable.

$$NDA_{\tau} = TA_{\tau-1}$$

This model assumes that the non discretionary component of accruals follows a random walk, which is inconsistent with the self reverting property of accruals.

2.2.3. The Friedlan Model

Since growth should affect certain aspects of a firm´s operations, including accruals, the random walk assumption underlying the DeAngelo model is not valid for growing firms. Friedlan (1994) introduces a modification to the DeAngelo model that attempts to control for the effect of growth on total accruals. This model assumes a constant proportionality between total accruals and sales in successsive periods. The non discretionary accruals for the Friedlan model are computed as:

$$NDA_{it} = TA_{it-1} / S_{it-1}$$

2.2.4. The Jones Model

Jones (1991) determined NDA for each firm by regressing total accruals on the change in sales revenues (REV) during the period and the gross level of property, plant and equipment (GPPE) using a time - series of observations. These variables were included to control for changes in the firm´s economic circumstances, GPPE to control for the portion of TA related to non - discretionary depreciation expense, and REV to control for the normal (unmanaged) level of current accruals. Sales revenues is an objective measure of the firm´s operation before manager´s manipulation, so that this variable will control for the economic environment of the firm[11].

$$NDA_{\tau} = \alpha_1 (1/A_{\tau-1}) + \alpha_2 (\Delta REV_{\tau}) + \alpha_3 (GPPE_{\tau})$$

where,

ΔREV_{τ} = *revenues in year* τ *less revenues in year* $\tau - 1$ *scaled by total assets at* τ*-1;*

$GPPE_{\tau}$ = *gross property plant and equipment in year* τ *scaled by total assets at* τ*-1;*

$A_{\tau-1}$ = *total assets at* τ*-1; and*

$\alpha_1, \alpha_2, \alpha_3$ = *firm-specific parameters.*

Estimates of the firm-specific parameters, $\alpha_1, \alpha_2, \alpha_3$, *are generated using the following model in the estimation period:*

$$TA_t = a_1 (1/A_{t-1}) + a_2 (\Delta REV_t) + a_3 (GPPE_t) + v_t$$

[11] Jones (1991) points out that this variable is not completely exogenous because revenues may be affected to some extent by managers´ attempt to modify reported earnings.

where, a_1, a_2, a_3 denote the OLS estimates of α_1, α_2, α_3 and TA is total accruals scaled by lagged total assets.

The expected sign for the GPPE coefficient is negative because it is related to depreciation expense. However, the expected sign for the change in revenue coefficient in not obvious, since a given change in revenue can bring about income - increasing changes in some working capital accounts but income decreasing in others.

Another important assumption made in this model is that changes in current assets and current liabilities are both driven by changes in revenues. Current liabilities, such as payables, are more likely to be related to expenses than to revenues. The omission of this relevant variable produces a potential bias towards finding positive managed accruals in an economic upswing and conversely in an economic downswing (Kang, 1999).

Systematic EM via the depreciation accruals is likely to have limited potential because the effect of changes in asset lives or in the depreciation method are required to be disclosed, so the associated earnings effects are comparatively sample to adjust ex – post. Because of this some authors have tested the Jones working capital model[12].

2.2.5. The Modified Jones Model

Considering the possibility of EM contamination of revenues, the modified Jones model assumes that discretion over revenue is not exercised in the estimation period and that changes in credit sales in the event period result from EM. This model provides a more powerful means of isolating revenue - based manipulation than the Jones model (Beneish, 1998). But if no EM occurs in the event year, unmanaged accruals will be understated by $\alpha_2 \Delta REC$, so managed accruals are overstated if $\Delta REC > 0$.

$$NDA_\tau = \alpha_1 (1/A_{\tau-1}) + \alpha_2 (\Delta REV_\tau - \Delta REC_\tau) + \alpha_3 (GPPE_\tau)$$

where

ΔREC_τ = net receivables in year τ less net receivables in year $\tau - 1$ scaled by total assets at $\tau - 1$.

2.2.6. The Industry Model

The Industry model was used by Dechow et al. (1991). This model assumes that variation in the determinants of NDA are common throughout firms in the same

[12] Janin (2000) provides evidence of the importance of working capital accruals. Although depreciation and amortisation explain the greatest part of total accruals, working capital accruals among all the total accruals components, exhibit the greatest variability.

industry, without directly controlling for the determinants of NDA. In this model NDA for the event period will be estimated as follows:

$NDA_\tau = \gamma_1 + \gamma_2\ median_1\ (TA_\tau)$,

where,

$median_1\ (TA_\tau)$ *is the median value of total accruals scaled by lagged assets for all non-sample firms in the same 2-digit SIC code.*

2.2.7. The Kang and Shivaramakrishnan Model

Kang and Shivaramakrishnan (1995) developed the following instrumental variable model:

$$[ACCB_T/ A_{T-1}] = \Phi_0 + \Phi_1[\delta_1 REV_T/ A_{T-1}] + \Phi_2 [\delta_2 EXP_T/ A_{T-1}] + \Phi_3[\delta_3 GPPE_T/A_{T-1}]$$

where,

$\delta_1 = ART_{T-1}/ REV_{T-1}$, $\delta_2 = OCAL_{T-1}/ EXP_{T-1}$,

$\delta_3 = DEP_{T-1}/ GPPE_{T-1}$

$ACCB_T$ = *accrual balance,* $CA_{I,T} - CASH_{I,T} - CL_{I,T} - DEP_{I,T}$

A_T = *net total asset*

CA_T = *current assets*

$CASH_T$ = *cash*

CL_T = *current liabilities excluding current portion of long term debt*

DEP_T = *depreciation and amortization*

ART_T = *receivables*

$OCAL_T$ = *all current asset less liabilities excluding accounting receivable,* $CA_{I,T} - ART_{I,T} - CASH_{I,T} - CL_{I,T}$

REV_T = *net sales revenues*

EXP_T = *all expenses other than depreciation expense*

$GPPE_T$ = *gross property plant and equipment*

The three important features of this model are (Kang, 1999):

- This model solves three important statistical problems that OLS estimation of Jones model has, simultaneity, errors in variables and omitted variables, by including expenses in the regression and using an instrumental variable approach.

- The estimated managed accruals are calculated using the level, rather than the change of current assets and current liabilities.

- The parameters δ_1, δ_2, δ_3 can be interpreted as turnover ratios which accommodate firm - specificity and compensate for the fact that the equation will be estimated from a pooled sample[13].

2.2.8. The Margin Model

Like Jones - style procedures, Peasnell et al. (2000) model abnormal accruals on accounting as prediction errors from an OLS regression of accounting accruals on a vector of explanatory variables designed to capture "normal" accrual activity. Working capital accruals is expressed as an explicit linear function of two drivers, sales and cash received from customers.

$$WCA_t = \omega + \gamma_1 REV_t + \gamma_2 CR_t + e_t$$

The parameter estimates of this model γ_1 and γ_2 have clear economic interpretations[14]:

- γ_1 reflects the average value of the sales margin and is predicted to be positive
- γ_2 reflects the average value of the cash margin and is predicted to be negative.

2.2.9. The McCulloch Model

The structure of this model is derived directly and explicitly from the structure of financial statements[15]. The most important feature of this model is its multiperiod approach. The effects of accrual reversals in future periods is an important issue to be taken into account when initiating discretionary accruals in the current period. Managers are thinking not only about the current period but also about future earnings. The model is expressed as follows:

$$\Delta WC_t = \beta_0 + \beta_1 AccRec_t + \beta_2 RevRatio_t + \beta_3 CFO_t + \sum_{i=1}^{H} \theta_i NEWDA_{t-1} + NEWDA_t$$

where,

AccRec = accounting receivables

$Revratio = (Rev_{t-1} accRec_t)/AccRec_{t-1}$

[13] Kang and Shivaramakrishan (1995) based their estimation on the longest available time - series of data. Kang (1999) based his estimation on a pooled cross - sectional firm´s data. Another difference is that the first work excludes tax related accruals whereas Kang (1999) includes tax related accruals.

[14] See Peasnell, Pope and Young (2000) for the formal analysis of the model. As these authors indicate, the primary difference between the margin model and the Jones working capital model is that the margin model disaggregates the change in revenue term into two components at the parameter fitting stage, substituting cash receipts in the current period for revenues in the prior period.

[15] See McCulloch (1998)

$$DA_t = \sum_{i=1}^{H} \theta_i NEWDA_{t-1} + NEWDA_t$$

CFO_t= *cash flow from operations*

The improvement of this model in accrual technology for investigating EM using DA can be seen through the incorporation of:

- the reversal of discretionary accruals into the estimation procedure, paying more attention to the duration of the effect on EM and the time -series properties of accruals,
- a contemporaneous negative correlation between DA and NDA, this correlation arises from the incentives that lead some managers to use DA to offset unfavourable NDA and from researcher measurement error, and
- a relation between accruals and Cash Flow, this relation arises from the smoothing action of GAAP driving a negative relation between change in net cash flow and unmanaged accruals, and as a result of discretionary smoothing in which Cash flow will be negatively correlated with discretionary accruals.

These innovations cannot be accommodated by the ordinary least squares approach to estimation because it requires the assumption that the regression (modelling NDA) and the residuals (proxing for DA) are uncorrelated. The author adopts a non linear instrumental design that allows the two components to be (negatively) correlated, and that allows the residual to follow the moving - average process.

2.2.10. The CFO Model

Shivakumar (1996) argues that a non - linear specification for cash flow from operation (hereafter CFO) is desirable since CFO may vary between firms in the estimation sample, due either to differences in the long - run level of return on assets or to matching and/or timing problems in CFO. This possibility has been implemented in the model allowing the slope coefficient on CFO to vary between firms as follows:

$$NDA_{it} = K_0 + K_1 \Delta REV_{it} / A_{it-1} + K_2 GPPE_{it} / A_{it-1} + K_3 d1_{it} * CFO_i / A_{it-1} + \kappa_4 d2_{it} * CFO_i / A_{it-1} + K\kappa_5 d3_{it} * CFO_i / A_{it-1} + K\kappa_6 d4_{it} * CFO_{it} / A_{it-1} + K\kappa_7 d5_{it} * CFO_{it} / A_{it-1.}$$

where,

CFO = cash from operations

Firms in each estimation sample are sorted into quintiles based on $CFO_{it}/ A_{i\,t-1}$.

This model has been tested by Jeter et al. (1999) using quarterly and annual data. An important feature of this model is that it is well specified for all cash flow levels.

2.2.11. The accounting process model

Dechow et al. (1995) and Guay et al. (1996) point out that the problems of the accrual models may derive from ignoring the time series properties and correlation structure of accruals and cash flows. The Cash flow model and the Mc Culloch Model we have just referred to, constitute the first attempts to incorporate cash flows to the modelling of non discretionary accruals.

Garza- Gómez et al. (1999) introduce a discretionary accrual model based on the accounting process. "The Accounting Process Model" is designed to reflect the cross correlation between earnings, accruals and cash flows as well as their serial properties, which arise naturally from applying GAAP. This model is expressed as follows:

$$NDA = \phi_0 (1/A_{it-1}) + \phi_1 (WK_{it-1} / A_{it-2}) + \phi_2 (LTA_{it-1} / A_{it-2}) + \phi_3 (CFO_{it}/A_{t-1}) + \phi_4 (CFO_{it-1} / A_{it-2})$$

Where,

WK = working capital accruals

LTA= long term accruals

CFO = cash flow from operations

2.3. TIMES - SERIES AND CROSS SECTIONAL MODEL ESTIMATION

The sample used for estimating expected accruals should be taken into account when interpreting parameter estimations. The estimation samples used in time series models are past data of the same firms. During this estimation period no systematic earnings management are expected to occur. Past accrual activity of the firm is considered a benchmark to determine the DA for an event - specific study[16]. This approach suffers from a survivorship bias (ten observations at least are required to estimate time - series models). Moreover, this methology introduces a selection bias as firms with such a long time series are more likely to be large, mature firms with greater reputational capital to lose if EM is uncovered (Jeter et al. , 1999). Apart from survivorship, other important aspects of these approaches are:

- Some structural economic changes may have occurred in such a long time. Although these models relax the assumption that NDA are constant over

[16] Time - series models generate firm - specific parameter estimations.

time, they consider a stationary relation between NDA and its explanatory variables over time.

- The self reverting property of accruals may introduce specification problems in the form of serially – correlated residuals.

- The discretion available through this period is expected to have changed because of changes in accounting rules and changes in firms' governing structures.

Cross sectional models do not make any assumption regarding systematic earnings management for the estimation sample, but they implicitly assume that the model parameters are the same in all firms in an estimation sample (Jeter et al., 1999). The replacements of time – series models by their cross – sectional counterparts introduces new problems. "Abnormal accruals" estimated from the models should be interpreted as abnormal accruals relative to the industry benchmark. If EM is expected to occur in several firms in an industry due to specific situations, the cross - sectional approach will introduce a bias against finding evidence of EM. So, EM tests will reject the null hypothesis only when accrual activity is significantly different from that exercised by firms in the same industry. Moreover, cross - sectional models are less likely to capture the effects of a) mean reversion in accruals, and b) dynamic accrual management strategies (Peasnell et al., 2000). Related to the number of firms in the sample, cross - sectional models have the potential to generate larger samples than time - series models.

2.4. STATISTICAL ISSUES

The real discretionary component of TA is not possible to be observed by the researchers, so they are forced to estimate the discretionary element by imposing on TA an expectation model of the non - discretionary component. Another source of problems in event - EM investigation is the omission of relevant variables for explaining DA and NDA(which induces measurement error in DA proxy).

Tests of event - specific EM suffer from important statistical issues, which consequences Dechow et al. (1995) sum up in :

- Incorrectly attributing EM to Part (dummy variable, 1 for the event year and zero otherwise) / unintentionally extracting EM caused by Part. This will occur when Part is correlated with the variables omitted explaining DA or the error in the researcher´s proxy for DA.

- Low power test because of the exclusion of relevant (uncorrelated) variables.

Young (1999) has paid special attention to the problems arising from measurement error in DA proxy and the omission of relevant variables explaining DA. The source and magnitude of this measurement error depends on the effectiveness with which the expectation model of NDA controls for the factors that determine the non - discretionary component of TA. Results suggest that the five models he analyses induce systematic measurement error in DA as a function of operating cash flow performance, sales growth and asset structure. Moreover, this author controls for relevant variables at explaining discretionary exercise of accrual activity, that is variables that control for differences in the propensity for earnings management, such as leverage, managerial equity ownership, size and income smoothing. The results obtained for some of these variables demonstrate the possibility for erroneous EM inferences when the DA proxy contains predictable measurement errors.

Hansen (1999) has also examined measurement error in discretionary accrual models. He finds that structural changes are associated with the direction and magnitude of discretionary accrual estimates and that the measurement error associated with these structural changes is correlated with the level of earnings. Since the level of earnings is often used by researchers to partition EM incentives or is correlated with the partitioning variable, this bias in discretionary accrual models generated by structural changes could cause researchers to reach incorrect EM conclusions.

Focusing on the non - discretionary accrual estimation by ordinary least squares, Kang (1999) identifies three statistical problems applying to the Jones model, simultaneity, errors in variables and omitted variables. Simultaneity arises because of failure to incorporate the identity constraint "accruals = earnings - cash flow from operations". Errors in variables are due to the fact that regressors can be manipulated, and the omitted variable problem results when key determinants of unmanaged accruals are omitted. These problems will be solved by introducing expenses as a variable in the model and by applying an instrumental variable approach.

3. SAMPLE

The sample of firms used to evaluate the models consists of 27 firms listed on the Madrid Stock Exchange that have first received audit qualification for GAAP violation from 1991 to 1998. As results from these violations earnings have been overstated[17]. Financials are excluded from the sample because of fundamental differences in the nature of their accruals and cash flows that are not captured by expectation models of normal accrual activity. The main source of information has been the database "Auditoría de cuentas anuales" published

[17] One firm of this sample has an audit qualification whose effect is an overstatement in equity.

by the "National Stock Market Commission" on a computer support, which includes the annual accounts and audit reports of most of the companies under the control of this commission.

TABLE 1

Data available has severely limited empirical testing of accrual models. A time series approach cannot be applied since consistent definitions of earnings, accruals and cash flows would restrict portfolio estimation to the years after 1990[18].

The cross sectional approach we adopt requires a sufficient number of observations in the industry - year portfolio, so all firms with fewer than six were excluded. Only firms with unqualified opinions from auditors are included in the sample estimation. As this sample remains very small (mean 12 and median 10) , we tried to solve this problem by including all industry portfolio from the same year [19] and introducing a set of industry dummy variables. The final sample comprises 241 firm year observations spanning 7 industry groups. The mean (median) number of firms in the year portfolio was 26 (27). Annual sample sizes are in table 1. Finally, we have estimated NDA from a pooled sample, considering an industry - year set of dummy variables and an industry set of dummy variables.

Data available has restricted the models that can be tested in this study to the Jones model, The modified Jones model, The Jones working capital model, The modified Jones working capital model and the margin model. The information needed to compute TA definition and its explanatory variables is obtained from firms' annual reports.

4. DATA ANALYSIS AND RESULTS

Consistent with previous studies of EM, TA is computed as:

TA_t = (Δ Current Asset - Δ Cash)- (Δ Current Liabilities - Δ Short - term debt)
- Depreciation and amortization expense

WA_t = (Δ Current Asset - Δ Cash)- (Δ Current Liabilities - Δ Short - term debt)

Contingency estimates are taken into account in the computation of TA through the variable Dep. Tax related accruals are not included in this definition, except

[18] Apellániz et al. (1995) find that the change in Spanish accounting regulation, the 1990 general accounting plan, reduced management´s opportunities to manipulate earnings.
[19] Only industry portfolios where there is a firm with GAAP audit qualification have been considered in the estimation sample.

from tax contingencies. Another important feature of this measure is that it does not include accruals from extraordinary items.

Ordinary least squares is used to obtain the coefficient estimates for different models. Prediction errors represent the level of discretionary or abnormal accruals.

$U_{jp} = TA_{jp} / A_{i\,p-1} - NDA$

Significance tests are computed using standardised prediction errors which are computed as:

$V_{jp} = u_{jp} / s\,(e_{jt})$,

where

$s\,(e_{jt})$ is the standard deviation of the error term from the cross sectional model estimated for firm j.

Parametric significance tests of the standardised prediction errors are computed as

$$Z_{vp} = \sum V_{jp} / [\sum (T_j - k)/ (T_j - (k + 2))]^{1/2}$$

Where,

T_j is the number of firms in the estimation sample

K is the model degree of freedom

Table 2 provides descriptive statistics on the parameter estimates and the test statistic generated (except for the independent term) for the Jones model, the Jones working capital model and the margin model[20].

TABLE 2

The GPPE coefficient presents the expected sign in seven out of eight years in the Jones model. The two coefficients in the margin model also present the expected sign but they cannot reflect the sales margin or the cash margin because they are too high in most of the years. The two variables of this model, revenues and cash received, are highly correlated[21].

[20] The estimation results for the modified Jones model are the same that estimation results for the Jones model. As Beneish (1998) points out $\Delta REV_t - \Delta REC_t$ can be rewritten as $(CR_t - REV_{t-1})$ where CR_t equals Cash Received in period t and re – specification of the modified Jones model in this way highlights the absence of any strong economic intuition for the purposed adjustment in the estimation sample.

[21] We cannot pay too much attention to the coefficient estimates in 1997 since the estimation sample consists only of 7 firms. The Z statistics remain similar without including the firm that has received GAAP audit qualification in 1997.

When referring to the pooled sample, all coefficient estimates present the expected sign and are significant at one percent in the margin model. The GPPE coefficient is also significant at one percent in the Jones model and the revenue coefficient is significant at five percent in the Jones working capital model. However, revenue variable is not significant in the Jones model[22].

As we can see in table 3, the Z statistic is positive and statistically significant at conventional levels for all models but for the margin model, so we can reject the null hypothesis that the average standardized prediction error is less or equal to zero. The results obtained from the modified Jones model and the modified Jones working capital model are very similar to the Jones model and the Jones working capital model, respectively[23].

TABLE 3

Although the results obtained could serve as evidence on the performance of alternative models measuring discretionary accruals in our Spanish context, we should be cautious when interpreting them because the prediction sample includes the more obvious and spectacular cases of earnings management and also because of the small number of firms available for the models estimations.

As contingency estimates may be subject to important manager´ judgement and although they are part of long term accruals they are related to current variables, we have also estimated the working capital accrual models considering them. However, the results are not different from these shown in this paper[24].

Accounting literature has shown us that existing accrual models are not useful for firms experiencing extreme financial performance. The accrual models tested by Dechow et al. (1995) reject the null hypothesis of no earnings management at rates exceeding specified test levels when applied to samples of firms with extreme financial performance. High rejection rates arise because firm – years with low (high) earnings also tend to have low (high) total accruals and accruals models attribute part of the lower (higher) accrual to negative (positive) discretionary accruals. On the other hand, low (high) cash flow from operation samples have high (low) total accruals resulting in an over – rejection (under – rejection) of the null hypothesis that earnings management is less or equal to zero (more or equal to zero). The results of the investigation carried out by Peasnell et al. (2000) indicate that the margin model generates relatively

[22] The results remain similar when considering an industry set of dummy variables instead of an industry - year of dummy variables for the pooled sample. Data are available upon request to the authors.

[23] That is, the modified Jones model and the modified Jones working capital model do not outperform the Jones model and the Jones working capital model. Although the revenue coefficient estimated in these models is positive, these results are due to the fact that the change in receivables is not very important and sometimes the level of receivables is even less than the year before.

[24] Data are available upon request to the authors.

better specified estimates when cash flow performance is extreme than the Jones working capital model and the Modified Jones working capital model. These findings are of particular interest for tests of EM in response to a stimulus. If the stimulus selected by the researcher is correlated with firm performance, false causal determinants of EM may be attributed to the stimulus.

Since the results of this paper could be driven by a potential extreme performance sample bias, we have analysed whether our sample belongs to the highest earnings decile or to the lower cash flow decile. Although only one firm belongs to the highest earnings decile, nine firms could be classified in the lowest cash flow decile, suggesting that our results could be due to the problem of the over – rejection of the null hypothesis that EM is less or equal to zero as has been pointed in Dechow et al. (1995).

Some researchers worried about the limited usefulness of accrual models for firm with extreme performance, have developed a model that provides a means of assessing the likelihood of opportunistic reporting among firms with large discretionary accruals. This is the case of Beneish (1997)[25]. This model adds to the modified Jones model two variables, lagged total accruals and a measure of past price performance, improving the specification of this model.

Despite these models having a general application, with the exception of firms experiencing extreme financial performance, it is important to jointly consider the situation and form in which earnings management is expected to occur and the models of non discretionary accruals. This implies taking into account the different models´ ability to detect specific forms of earnings management[26] and some particularities of a country's accounting regulations. The findings in Peasnell et al. (2000) suggest that the Jones working capital model and the modified Jones working capital model are substantially more powerful at detecting subtle revenue and bad debt manipulations. However, the margin model outperforms the Jones working capital model and the modified Jones working capital model. So, these authors suggest that the use of several models in combination may improve the detection of accrual management, the specific form of which is impredictable.

Young (1999) evaluates discretionary accruals estimated by different models using a method that controls for potential variation in the propensity for EM activity. If firms in the industry present a high propensity to manage earnings, the benchmark provided by cross sectional models may also be too high, so that it will be difficult to detect earnings management.

[25] This author proposes the use of this model where extreme financial performance is likely, such as security offerings and financial distress.

[26] McNichols et al. (1988) model the provision for bad debts in the absence of EM and use the expected provision for that model to test EM.

5. SUMMARY AND CONCLUSION

Several cross sectional models (the Jones model, the modified Jones model, the Jones working model, the modified Jones working capital model and the margin model) have been examined in a Spanish context. The sample of firms suspected of having managed earnings consists of firms that have received GAAP audit qualifications, so these firms represent the most obvious and spectacular cases of earnings management. We select this sample in order to test the ability of different accrual models to detect EM when it does really exist in a Spanish context. The abnormal accruals detected are significantly positive for all models except for the margin model. Potential extreme financial performance bias can not be ruled out as an explanation for these results**.** An important limitation of this paper is the estimation and the prediction sample size, so these results should be interpreted cautiously.

By adding evidence on the usefulness of different accrual models as a tool to detect EM, the results of this paper contribute to the EM literature in two ways. First, we provide additional evidence on whether different accrual models detect EM by using a sample of firms suspected of having managed earnings instead of a sample where a fixed and known amount of accruals have been added to each firm. Second, this paper provides additional evidence on the use of accrual models in a different accounting regime, such are the Spanish accounting regulation, characterised by a high degree of conservatism introduced by the principle of prudence.

Future investigation into earnings management must seek to improve accrual models technology to detect earnings management. Young (1999) has identified the source of systematic measurement error but it remains to be seen how to control for them in new models.

An issue of a great importance to be considered in EM investigation is the relation between the context in which EM is hypothesized and the NDA model. This context includes special GAAP features in countries too. Models have different ability to detect specific forms of EM activity so this ability and the specific form of EM one expects to find, should be taken into account when choosing among different models. Since the discretionary accrual model provides us with a benchmark for the determination of the exercise of discretionary accruals activity, the propensity and restriction for EM of sample estimation firms is specially relevant in cross sectional models.

Another important issue is that TA definition does not include extraordinary items. The accounting discretion exercised through these items may be

considered in this kind of investigation as complementary means of EM (McCulloch, 1998).

References

Apellániz, P. and Labrador, M. (1995) "El impacto de la regulación contable en la manipulación del beneficio. Estudio empírico de los efectos del PGC de 1990", *Revista Española de Financiación y Contabilidad,* 24(82): 13 – 40.

Barth, M.E., Beaver, W.H., Hand, J.R.H., and Landsman, W.R. (1999) "Accruals, Cash Flow and Equity Values", Working Paper Standford University and University of North Carolina.

Beneish, M.D. (1997) "Incentives and penalties related to earnings overstatements that violate GAAP", *The Accounting Review,* 74 (4): 425 - 457.

Beneish, M.D. (1998) "Discussion of "Are accruals during initial public offerings opportunistic*?", Review of Accounting Studies,* 3 (1-2): 209-215.

Brown, S.J., and Warner, J.B. (1985) "Using daily stock returns: the case of event studies", *Journal of Financial Economics,* 14: 3 – 31.

Burgstahler, D., and Dichev, I. (1997) "Earnigns management to avoid earnigns decreases and losses", *Journal of Accounting and Economics,* 24 (1): 99 - 126.

Collins, D.W. and Hribar, P. (1999) "Errors in estimating accruals: implications for future research", . Working paper, University of Iowa.

DeAngelo, L.E. (1986) "Accounting numbers as market valuation substitutes: a study of management buyouts of public stockholders", *The Accounting Review,* 61(July):400-420.

DeAngelo, L.E. (1988a) "Discussion of evidence of earnings management from the provision for bad debts", *Journal of Accounting Research,* 26(supplement): 32 – 40.

DeAngelo, L.E. (1988b) "Managerial competition, information costs, and corporate governance: the use of accounting performance in proxy contests", *Journal of Accounting and Economics,* 10 (January): 3-36.

Dechow, P. (1994) "Accounting earnings and cash flows as measures of firm perfomance: the role of accounting accruals", *Journal of Accounting and Economics,* 18 (1): 3-42

Dechow, P., R. Sloan, and Sweeney, A. (1995) "Detecting earnings management", *The Accounting Review,* 70 (April): 193-225

Dechow, P.M., Sloan R.G and Sweeney, A.P. (1996) "Causes and consequences of earnings manipulation: an anlysis of firms subject to enforcement actions by the SEC", *Contemporary Accounting Research,* 13(1):1-36.

Dechow, P.M., and Skinner, D.J. (2000) "Earnings managment: reconciling view of accounting academics, practitioners, and regulators. Working Paper, University of Michigan.

Dechow, P.M., and Sloan, R.G. (1991) "Executive incentives and horizon problem: An empirical investigation", *Journal of Accouting and Economics* 14 (1): 51 - 89.

DeFond, M.L. and Jiambalvo J. (1993) "Factors Related to Auditor-Client Disagreements over income-increasing accounting methods", *Contemporary Accounting Research,* Spring: 415-431.

DeFond, M.L. and Jiambalvo J. (1994) "Debt covenant violation and manipulation of accruals", *Journal of Accounting and Economics,* 17 (1-2):145-176.

DeFond, M.L. and Jiambalvo, J. (1991) "Incidence and Circumstances of Accounting Errors", *The Accounting Review,* July: 643-655.

DeFond, M.L. and Subramanyam, K.R. (1998) "Auditor changes and discretionary accruals", *Journal of Accounting and Economics* , 25 (1): 35-67

Erikson M. and Wang, S. (1999) "Earnings management by adquiring firms in stock for stock mergers", *Journal of Accounting and Economics,* 27(2):

Friedlan J.M. (1994) "Accounting choices of issuers of Initial Public Offerings", *Contemporary Accounting Research,* 11(Summer): 1-31.

Garza- Gómez X., Okumura, M., and Kunimura, M. (1999) "Discretionary accrual models and the accounting process", Working Paper , Nagoya City University.

Gaver, J.J., Gaver, K.M. and Austin, J. (1995) "Additional evidence on bonus plans and income management", *Journal of Accounting and Economics,* 19 (February): 3-28.

Guay, W.R., Kothari, S.P. and Watts, R.L. (1996) "A market-based evaluation of discretionary accrual models", *Journal of Accounting and Economics,* 34 (Supplement): 83-105

Hansen, G.A. (1999) "Bias and measurement error in discretionary accrual models", Working Paper, Pen State University.

Healy, P. (1985) "The effect of bonus schemes on accounting decisions", *Journal of Accounting and Economics,* 7 (April): 85-107

Healy, P. (1996) "Discussion of a market based evaluation of discretionary accrual models", *Journal of Accounting and Economics,* 34 (supplement): 107-115.

Healy, P.M., and Whalen, J.M. (1999) "A review of the earnigns managemnet literature and its implications for standard setting", Accounting Horizons, 13 (4): 365 - 383.

Healy, P.M., and Whalen, J.M. (1999) "A review of the earnings management literature and its implications for standard setting", *Accounting Horizons*, 13 (4): 365 – 383.

Holthausen, R. W., Larcker, D. And Sloan, R. (1995) "Annual bonus schemes and the manipulation of earnings", *Journal of Accounting and Economics,* 19 (1): 29-74

Janin, R. (2000) "Accrual – based models for detecting earnings management and the French case", 23rd European Accounting Association Annual Congress.

Jeter, D.C. and Shivakumar, L. (1999), "Cross sectional estimation of abnormal accruals using quarterly and annual data: effectiveness in detecting event - specific earnings management", *Accounting and Business Research,* 29(4): 299 – 319.

Jiambalvo, J. (1996) "Discussion of "causes and consequences of earnings manipulation: an anlysis of firms subject to enforcement actions by the SEC", *Comtemporary Accounting Research,* 13 (1):37 –47.

Jones, J. (1991) "Earnings management during import relief investigations", *Journal of Accounting Research*, 29 (Autumn): 193-228

Kang, S. H. and Shivaramakrishnan, K. (1995) "Issues in testing earnings management and an instrumental variable approach", *Journal of Accounting Research,* 33(2): 353-367

Kang, S.H. (1999) "A conceptual and empirical evaluation of accruals prediction models", Working paper, Yale School of Management.

Kothari, S.P. (2000) "Capital markets research in accounting", Working paper, Massachusetts Institute of Technology.

Mc Culloch, B.W. (1998) "Multi – period incentives and alternatives dials for earnings management", Working paper, University of Washington.

McNichols M., and Wilson, G.P. (1988) "Evidence of earnings management from the provision for bad debts", *Journal of Accounting Research,* 26 (supplement): 1 – 31.

Peasnell, K.V., Pope, P.F. and Young, S. (1998) "Detecting earnings management using cross – sectional abnormal accruals models", *Accounting and Business Research*, 30 (4): 313 – 326.

Pfeiffer, R.J., Elgers, P.T., Lo, M.H. and Rees, L. (1999) "Additional evidence on the incremental information content of Cash Flows and Accruals: the impact of errors in measuring market expectations", *The accouting Review*, 74(3): 373 – 385.

Press, E.G. and Paek, W.P. (1998) "Discretionay accruals, manager´incentives and stock prices", Working Paper, Temple University and Sung Kyun Kwan University.

Schipper, K. (1999) "Implications of requirement to discuss quality (not just acceptability) of reporting on accounting research and the decision making of standars setter, regualtors, management, audit committees, and auditors", Adress at the 1999 AAA/FASB Financial Reporting Issues Conference.

Shipper, K. (1989) "Commentary on earnings management", *Accounting horizons,* 3 (December): 91 – 102.

Shivakumar, L. (1996) "Essays related to equity offerings and earnings management" Ph. Dissertation, Vanderbilt University.

Subramanyam, K.R. (1996) "The pricing of discretionary accruals", *Journal of Accounting and Economics*,22 (1-3): 249-281.

Teoh, S.H., Welch, I. and Wong, T.J. (1998) "Earnings management and the post issue underperformance of seasoned equity offerings", *Journal of Financial Economics,* 50 (October):63 – 99.

Teoh, S.H., Wong, T.J. and Rao, G.R. (1998) "Are accruals during initial publi offerings opportunistic?", *Review of Accounting Studies,* 3 (1-3): 175 - 208.

Watts, R. and Zimmerman, J.L. (1990) "Positive accounting theory: a ten year perspective", *The Accounting Review,* 65 (January): 131-156.

Young, S. (1999) "Systematic measurement error in the estimation of discretionary accruals: an evaluation of alternative modelling procedures", *Journal of Business Finance and Accounting,* 26(7): 833 – 861.

Zmijewski, M.E. and Hagerman, R.L. (1981) "An income strategy approach to the positive theory of accouting standard setting choice", *Journal of Accounting and Economics,* 3 (August): 129 –149.

TABLE 1: Distribution of sample estimation firms by industry group

	91	92	93	94	95	96	97	98
Cement, glass and building material	12							10
Chain stores and other services						7		
Building						6	7	
Energy and water					13			
Property companies	10	7	8	10		10		
Other transformation industry	19	15	14	15	18	23		
Metal transformation	8		7					22
Total (241)	49	22	29	25	31	46	7	32

Table 2: Ordinary Least Squares estimates for accrual models (annual sample estimation and pooled sample estimation)

The Jones model $TA = \alpha_1 + \alpha_2 \Delta REV + \alpha_3 GPPE + e$

The Jones working capital model: $WCA = \alpha_1 + \alpha_2 \Delta REV + e$

The Peasnell Pope and Young model: $WCA = \omega + \gamma_1 REV + \gamma_2 CR + e$

Jones	**adj R2**	α_2	$t\alpha_2$	α_3	$t\alpha_3$
1991	0.17	0.06	0.80	-0.09	-3.08
1992	0.48	0.18	1.86	-0.12	-2.83
1993	0.49	0.30	4.69	-0.04	-1.33
1994	-0.09	0.03	0.30	-0.01	-0.17
1995	0.26	-0.07	-0.41	-0.18	-3.30
1996	0.29	0.08	0.93	-0.02	-0.70
1997	-0.16	-0.26	-0.57	0.45	0.82
1998	0.01	0.03	0.50	-0.03	-0.96

Jones WK	**Adj. R2**	α_2	$t\alpha_2$
1991	0.34	0.22	4.13
1992	0.25	0.23	2.17
1993	0.49	0.30	4.97
1994	-0.01	0.15	1.25
1995	0.04	-0.04	-0.41
1996	0.21	-0.14	-1.43
1997	-0.09	-0.31	-0.71
1998	-0.03	0.05	0.81

Margin M.	**Adj. R2**	γ_1	$t\gamma_1$	γ_2	$t\gamma_2$
1991	0.54	0.68	6.96	-0.68	-6.93
1992	0.68	0.89	5.97	--0.89	-5.89
1993	0.73	0.94	8.26	-0.94	-8.08
1994	0.10	0.33	1.76	-0.31	-1.62
1995	0.57	0.95	5.77	-0.96	-5.82
1996	0.84	0.92	12.72	-0.92	-12.80
1997	0.20	0.95	1.88	-1.18	-1.85
1998	0.76	0.96	9.17	-0.97	-9.44

Pooled sample estimation

	Adj. R2	α_2 / γ_1	$t\alpha_2$ / $t\gamma_1$	α_3/ γ_2	$t\alpha_3$/ $t\gamma_2$
Jones	0.14	0.01	0.27	-0.05	-3.36
Jones WK	0.07	0.07	2.04		
Margin model	0.56	0.91	16.42	-0.91	-16.41

TABLE 3: Z – statistic for 27 GAAP audit qualification firms

	Z- statistic (annual sample estimation)	Z- statistic (pooled sample estimation)
Jones model	2.4729*	1.9845**
Modified Jones model	2.4564*	1.9666**
Jones Working Capital model	2.5198*	2.0988**
Modified Jones Working Capital model	1.8129**	1.9942**
Margin Model	-0.8207	-0.7124

* Statistically significant at the 0.01 level (one - tailed)
** Statistically significant at the 0.05 level (one – tailed)