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# AN EXPLORATORY STUDY OF PROFESSIONAL ETHICAL STANDARDS, POSITIVE BUDGETING ORIENTATION, AND THE MEDIATING ROLE OF CORPORATE ETHICAL VALUES

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**ABSTRACT**

*The purpose of this exploratory study was to empirically assess interrelationships between professional ethical standards, corporate ethical values, and the concept of positive budgeting orientation. It was believed that perceived ethical values would fully or partially mediate the proposed positive relationship between perceived professional ethics and positive budgeting in companies. Survey data were gathered from experienced managers, some of which were members of the Institute of Management Accountants, and students in MBA and Executive MBA programs located in the Mountain West and Midwestern regions of the United States. Overall, 290 surveys of managers who worked in a variety of business occupations were assessed. The findings showed a strong positive association between professional ethical standards and corporate ethical values, as well as between ethical values and a positive budgeting orientation. In the presence of these relationships, the professional ethical standards and positive budgeting orientation variables were unrelated, indicating that perceived ethical values functioned as a full mediator. The findings implied that ethical environments in both professions and organizations can be used to enhance positive budgetary practices.*

**JEL**: M14, M41

**KEYWORDS**: Professional Ethics, Positive Budgeting, Corporate Ethical Values

## INTRODUCTION

Ethical guidelines that influence the workplace behaviors and practices of employers and their employees are often institutionalized in different professional and organizational environments. At the occupational level, professional ethical standards stem from ethical guidelines embedded in education programs, licensures, and/or certification processes that identify with an ethics code and related ethical monitoring capabilities (Bullock & Panicker, 2003; Gaumnitz & Lere, 2004). Ultimately, professional ethical standards enhance employee ethical attitudes and commitment (Valentine & Fleischman, 2008b). At the organizational level, corporate ethical values (also operationalized as ethical culture/climate) refer to the formal and informal ethics-related policies used by companies to set the ethical tone within the workplace (Hunt et al., 1989; Sims, 1991; Trevino et al., 1998; Trevino & Nelson, 2004). These ethical principles affect many important employee attitudes and perceptions (e.g., Hunt et al., 1989; Valentine et al., 2011a; Valentine et al., 2011b; Valentine et al., 2006). In practice, these two environments should work together to influence important organizational outcomes, with one such factor being a positive budgeting orientation, an exploratory concept linked to beneficial budgeting practices in a firm. There is reason to believe that these contextual factors are keenly interrelated. For instance, a linkage between professional ethical standards and corporate ethical values can be identified using the multi-stakeholder governance network, which comprehensively overlays various interfaces among

professional associations, professional employees, all levels of organizations, and governments (Bonn & Fisher, 2005; Gotterbarn, 2009). The former stakeholders represent self-regulation and the latter the moral floor, respectively (Bonn & Fisher, 2005; Gotterbarn, 2009). Most importantly, the multi-stakeholder governance approach helps explain how employees may defer to their professions' ethics training, standards, and expectations when facing ethical disconnects related to functional job-related circumstances in their organization (Higgs-Kleyn & Kapelianis, 1999), thus shaping organizational practice and influencing what employees elect to *do* at work.

A key motivation then is to link the professional ethical standard-corporate ethical value relationship to important work-based outcomes related to functional ethical issues. We contend that a positive budgeting orientation is one such relevant variable. For example, corporate ethical values influence employee workgroup outcomes in the marketing, human resources, and accounting context where employees may face unique budget-related ethical dilemmas resulting from pressures to meet quotas or performance targets. Due to these pressures, unfair work environments may develop that put the organization as a whole at risk (Walker, 2009). Consequently, this study explores the positive budgeting orientation concept because of its importance to many organizations. For instance, budgeting impacts most aspects of the internal managerial accounting process (Covaleski et al., 2003), a process that dates back to the piecework standards espoused by Frederick Taylor in 1911 (Walker et al., 2012). The budgeting process may also be viewed as a managerial control vehicle to enhance *management by exception* and incentivize employee performance that is tied to meeting budget targets.

Additionally, the budget is often used either for corrective action or as a motivator for performance (Benston, 1963; Merchant & Manzoni, 1989; Ronen & Livingstone, 1975), which may also be tied to pecuniary benefits, such as salary increases and/or bonuses. In budgeting situations such as these, employee tension often arises to attain predetermined goals. Unfortunately, the budgeting ethics literature suggests that all too often these budgetary incentives trigger unethical activities. For example, in participative budgeting there may a tendency for employees to set their target goal *below* what they believe is attainable in order to increase the probability of meeting their goal and obtaining the target bonus, a process often referred to as creating budgetary *slack* (Chow et al., 1988; Healy 1985; Jennergren, 1980; McNabb & Whitfield 2007; Young 1985). Ultimately, budgeting processes may induce employees to lie and cheat on a widespread basis, which destroys employee commitment and empowerment, and ultimately leads to an environment of fear (Argyris, 1998; Kirchgaessner & Waters 2002). These conditions can severely compromise an organization's level of ethics.

Because the budgetary process may inadvertently provide incentives to act unethically, we are therefore motivated to assess how a positive budgeting orientation is related to professional ethical standards and corporate ethical values. Our reasoning for this investigation is based on the contention that professional values, combined with an ethical organizational environment, mitigate unintended budget-induced ethical dysfunction when combined with a positive budgeting orientation that is supported by management. This study contributes to the business ethics literature in general, and to the field of budgetary ethics in particular, while also being pragmatically useful for companies wishing to minimize budgetary slack creation and generalized gaming. This is also the first study that links relationships between professional ethical standards, corporate ethical values, and a positive budgeting orientation. A better understanding of these relationships is essential for addressing budgetary slack unethical behavior that can occur in the workplace. The remainder of this manuscript is organized as follows. The next section presents the literature for each of the focal variables, professional ethical standards, corporate ethical values, and positive budgeting orientation. The following section discusses the study's methodology, including data collection, measures, and statistical analyses. Next, the empirical results are presented, followed by an overview of the study's findings, contributions, and limitations.

## LITERATURE REVIEW

A profession is defined as "a moral community…a non-random collection of groups of people engaged in reciprocal and positive social interaction" (Sama & Shoaf, 2008, p. 41). The discipline of professional ethical standards often assumes a relationship between the ethics espoused by professional associations and those operationalized at the organizational level. Consequently, the ethics of professions and professionals, as well as the attitudes and behaviors prompted by such principles, tend to be a reflection of a complex web of informal and formal governance infrastructures within professional associations, organizations, and key stakeholder groups, which are juxtaposed against motivations of self-interests (De Cremer et al., 2010; Frankel, 1989; Valentine & Fleischman, 2008b; Valentine & Johnson, 2005).

Professional associations often clarify responsibilities through formalized ethics codes (Mabe & Rollin, 1986), promote ethical standards through educational programs, licensures, and certification processes, and sanction unethical member behavior by suspension or removal from membership (Bullock & Panicker, 2003; Gaumnitz & Lere, 2004; Skubik & Stening, 2009). Frankel (1989) stated, "A code embodies the collective conscience of a profession and is a testimony to the group's recognition of its moral dimension" (p. 110). There is general agreement among code supporters that when professional ethical standards are effectively codified, they 1) establish the primary foundation upon which the moral rights, duties, and educational and reporting requirements (for the professional and organization) are built (Mabe & Rollin, 1986; Messikomer & Cirka, 2010; Pitt & Groskaufmanis, 1990; Schwartz, 2004; Stevens, 2008; Vinten, 1990); 2) provide aspirational guidelines that lift ethical behavior to higher but reachable levels (Gotterbarn, 2009; Rottig et al., 2011; Valentine & Fleischman, 2008b); 3) define compliance-oriented ethical standards and sanctions (Murphy, 1989); 4) provide a tangible deliverable wherein professional norms are pronounced to stakeholders (Frankel, 1989; Murphy, 1989); 5) are effectively integrated at firm and professional association levels through educational initiatives (Murphy, 1989); 6) serve as a vehicle for professional identity and mark the maturity of a profession (Mabe & Rollin, 1986); and 7) contribute to positive ethical climate (Bonn & Fisher, 2005; Brown et al., 2005; Gotterbarn, 2009; Hoogervorst et al., 2010; Mayer et al., 2010; Murphy, 2005; Schwartz, 2004).

While codified professional standards are important, their presence does not guarantee ethical conduct (Gotterbarn, 2009; Petersen & Krings, 2009; Rottig et al., 2011; Schwartz, 2004; Skubik & Stening, 2009; Stevens, 2008). Some experts advocate legal constraints combined with sound internal auditing procedures to elevate professional behaviors to defined ethical standards (Berenbeim, 2010; Pitt & Groskaufmanis, 1990). Alternatively, others claim a normative culture that treats ethics as a responsibility (instead of a right) will influence code effectiveness, rather than legalistic, compliance-oriented statements (Schwartz, 2000; Trevino & Weaver, 2003). Research recognizes the integrative and strategic roles of professional ethical standards within the organization, as well as between the organization and the professional association. In a related manner, this involves institutionalization of codes, top management commitment, transformative leadership and culture, and informal or formal governance infrastructures supporting a firm-level comprehensive integrity strategy (Ferrell, 1999; Gotterbarn, 2009; Mabe & Rollin, 1986; Murphy, 2005; Paine, 1994; Skubik & Stening, 2009; Snell & Herndon, 2000; Stevens, 2008; Tucker et al., 1999). The process also includes ethics selection tools used by human resources, as well as more global initiatives that support a larger governance system for the profession (Berenbeim, 2010; Singhapakdi et al., 2010). The relationship between professional ethical standards and corporate ethical values may best be understood through a multi-stakeholder governance network involving interfaces between professional associations, professionals, organizations (all levels), and governments, with the former fueling self-regulatory efforts and the latter representing the moral floor (Bonn & Fisher, 2005; Gotterbarn, 2009). Some argue that this approach is the most appropriate for managing organizational risk, a result of considerations of multi-party ethical standards evidenced in codes, licensing, policy and procedures, and ethical contexts (Gotterbarn, 2009; Messikomer & Cirka, 2010).

The assumption behind the multi-stakeholder governance approach is that the reciprocal engagements between engaged stakeholders are motivated by duties to be truthful in the provision of information, and respect for privacy or confidentiality (Sama & Shoaf, 2008). The reality of the multi-stakeholder governance approach is that professionals may experience an ethical dilemma caused by a disconnect between the ethical standards within their profession and what is considered ethical behavior in the organization in which they are employed; and as a result, show deference to the ethical principles espoused by the profession over the standards evidenced in their organization (Higgs-Kleyn & Kapelianis, 1999). Although it is a well-accepted assumption that professional ethical standards relate to corporate ethical values in important and potentially complex ways, there is a paucity of significant empirical findings that link managers' perceptions of professional and organizational ethics with their assessments of the ethicality of business outcomes.

Corporate Ethical Values, Positive Budgeting, and Outcomes

Corporate ethical values "define the standards that guide the external adaption and internal integration of organizations…[and] influence organizations' product and service quality, advertising content, pricing policies, treatment of employees, and relationships with customers, suppliers, communities, and the environment" (Hunt et al. 1989, p. 79). It should follow that such values serve to define the ethical standards by which the organization adapts to its environments and ultimately affect business outcomes through internal marketing, accounting, finance, human resource, and other initiatives. Corporate ethical values should therefore affect business practices utilized in organizations. Corporate ethical values and other forms of ethical context are dynamic constructs that present varying multidimensionality based on contextual differences (Amyx et al., 2008), being influenced by ethics codes, training, rewards/sanctions relating to ethical/unethical conduct, ethical leadership, and other normative elements and affecting each element of the individual ethical reasoning process (Hunt & Vitell, 1986; Rest, 1986; Trevino & Nelson, 2004; Trevino et al., 1999; Valentine & Barnett, 2002, 2007; Valentine & Fleischman, 2004). Singhapakdi et al. (2010) claimed that:

> …implicit ethics institutionalization refers to a work climate in which ethical behavior is understood by employees to be crucial in the makeup and functioning of the firm. For example, a company that has a high level of implicit ethics institutionalization is one that informally expects all of its managers…to demonstrate a high level of professionalism, honesty, and integrity. In contrast, explicit ethics institutionalization refers to the codification of ethical behavior in terms of codes of ethics, policy manuals, orientation programs, and ethics committees (p. 78).

The degree to which company officials and top management are proactively engaged in the advancement of business ethics also determines employees' perceptions of and commitment to ethical culture/climate (Chonko & Hunt, 1985; Hunt et al., 1985, 1989, Valentine & Barnett, 2002). A number of studies have found leadership to be the most important predictor of an organizations ethical climate, specifically through the mechanisms of referent power (Mayer et al., 2010) and transformational leadership (Engelbrecht et al., 2005). By contrast, the least important determinants of an organizations ethical climate are traditional top-down code governance systems based upon forced compliance, weak sanctions, limited buy-in, lack of clarity, lack of integrity, or conflicting standards when compared to professional associations or other governing bodies (Mabe & Rollin, 1986; Schwartz, 2000; Stevens, 2008; Trevino et al., 2003; Trevino & Weaver, 2003). Table 1 shows some empirically supported antecedents, outcomes, and moderator variables associated with corporate ethical values and other measure of ethical context. Research to date tends to identify (1) organizational (rather than professional) level variables as antecedents to corporate ethical values (Amyx et al. 2008; Valentine 2009; Valentine et al. (2011a), (2) organizational (rather than functional or support) level variables as outcomes of corporate ethical values (Amyx et al., 2008; Elci et al., 2007; Hunt et al., 1989; Jaramillo et al., 2006; Pettijohn et al., 2008;

Schwepker, 2001; Valentine, 2009; Valentine & Barnett, 2007; Valentine et al., 2011a), (3) the importance of testing for mediation when corporate ethical values is involved (Jaramillo et al., 2006; Singhapakdi et al., 1999; Valentine et al. 2006, 2011b), and (4) that corporate ethics may itself be a mediator variable associated with business outcomes (e.g., sales performance and job satisfaction) (Amyx et al., 2008). Generally speaking, corporate ethical values, ethical culture/climate, and other measures of company ethics are all considered similar reflections of ethical context (Jaramillo et al., 2006; Valentine & Barnett, 2007). Research supports the idea that ethical contexts (values, cultures, climates, etc.) differ in nature and complexity within functional areas of an organization (Weber, 1995).

Hunt et al. (1989) recommends that after first institutionalizing the ethical principles underlying policies and procedures, an organization should set specific ethical standards for positive marketing orientations in the areas of "product and service quality, advertising content, pricing policies, relationships with customers, suppliers, and all other exchange relationships that affect organizational success" (p. 88). Other research by Cohen and Reed (2006) seems to support a function-specific focus for ethical standards, whereby "people rely strongly on extremely context-specific attitudes rather than on the generalized attitudes that people would be more likely to hold and update in some enduring fashion" (p. 5). Given these positions, further research on corporate ethical values as contextualized in other high assay functional areas within an organization appears to be a valuable pursuit.

Corporate ethical values influence functional-level (or work group) outcomes. Specifically, certain types of employees (e.g., boundary spanning, marketing, accounting, human resources) may face unique ethical dilemmas due to pressures to make quotas, meeting the expectations of vested stakeholders, and equitably managing resources and budgets. As a result, unfair work environments may develop and put the organization at risk (Walker, 2009). Within the sales and marketing function, for example, DeConinck et al. (1995) found top performing salespersons were more likely to 'get by' with unethical behavior. Specifically, when sales managers observed the same unethical behavior from two salespersons, the poorer performing salesperson will be more strongly reprimanded (verbally or in writing), be less likely to get a pay raise or promotion, and be more likely to receive a cut pay or notice of termination of employment (DeConinck et al. 1995). By comparison, the same study found when sales managers perceived the salesperson's act had positive consequences for the organization the reprimand was less severe. Amyx et al. (2008) advises sales managers to remedy unfair work environments and procedures, as doing so will enhance perceptions of corporate ethical values.

At an individual-level, research shows that different dimensions of corporate ethics affect employees' ethical decisions. Smith et al. (2007) found that the decision to act unethically results more from the anticipated manager evaluation and expected outcomes of the act (i.e., likelihood of termination, loss of respect on the job or from friends or family, feelings of personal shame, loss of future potential, potential of hurting the company's reputation, effect on career progress), rather than from the actual threat of legal action. Interestingly, anticipated manager evaluations of the act may encourage unethical behavior when supervisors utilize authority to demand misconduct from supervisees (Smith et al. 2007). However, there is little to no research to date that links professional ethical standards (as a separate entity from corporate ethical values) to functional-level outcomes.

One possible outcome of professional ethical standards and corporate ethical values is a positive budgeting orientation. Positive budgeting orientation represents an exploratory construct that has not been investigated in the budgeting ethics literature. The construct is comprised of positive components of a budgeting environment that help minimize budgetary slack in a business. For example, the construct includes factors such as budget employee motivation that maximizes value for stakeholders, management support of the budget, and budget processes that increase organizational value as well as planning control.

Table 1: Some Empirical Findings Identifying the Antecedents, Outcomes, and Moderators Associated With Corporate Ethical Values (CEV) and Other Measures of Ethical Context

| **Organizational Level Antecedent Variable** | **Focal Variable** | **Source** |
|---|---|---|
| Group Creativity (positive) | CEV | Valentine et al. (2011a) |
| Ethics Training (positive) | CEV | Valentine (2009) |
| Fairness and Organizational Commitment (positive) | CEV | Amyx et al. (2008) |
| Organizational Citizenship Behavior (positive) | CEV | Amyx et al. (2008) |
| **Focal Variable** | **Related Outcome** | **Source** |
| CEV | Job Satisfaction (positive) | Amyx et al. (2008); Jaramillo et al. (2006); Pettijohn et al. (2008); Schwepker (2001); Valentine (2009); Valentine et al. (2011a) |
| CEV | Turnover Intention (negative) | Elci et al. (2007); Jaramillo et al. (2006); Pettijohn et al. (2008); Schwepker (2001)Valentine et al. (2011a) |
| CEV | Group Creativity (positive) | Valentine et al. (2011a) |
| CEV | Sales Performance (positive) | Amyx et al. (2008); |
| CEV | Ethical Intention (positive) | Valentine & Barnett (2007) |
| CEV | Organizational Commitment (OC) (positive) | Hunt, Wood, & Chonko (1989); Schwepker (2001) |
| **Focal Variable & Indirect Outcome Variable** | **Mediated Relationship** | **Source** |
| CEV * Job Response (i.e., Altruism) | Career Satisfaction (full mediation) | Valentine et al. (2011b) |
| CEV * Individual Work Attitudes (Satisfaction) | Perceived Organizational Support (partial mediation) | Valentine et al. (2006) |
| Ethical Climate (CEV proxy) * Job Performance | Job Stress and Job Attitude (mediation) | Jaramillo et al. (2006) |
| Ethical Climate (CEV proxy) * Reduced Turnover Intention and Increased OC | Role Conflict and Role Ambiguity (mediation) | Jaramillo et al. (2006) |
| CEV * Ethical Intention | Moral Philosophies and Perceived Moral Intensity (partial mediation) | Singhapakdi et al. (1999) |
| *Mediated Variables* | *Focal Variable as Mediator* | Source |
| Ethical Environments * Job Satisfaction and Sales Performance | Mediated by CEV | Amyx et al. (2008) |

*This table shows the relationship between corporate ethical values (CEV) and other antecedents, outcomes and moderators as they relate to the ethical context. The table also highlights the role that CEV has played in previous literature and assists the reader to identify the role CEV has employed as a mediating variable. The purpose of the table is to provide a snapshot of CEV in past literature to provide context for the role of CEV employed by the present study.*

The positive budgeting orientation variable is included in this study to link professional ethical standards and corporate ethical values to another important business outcome. We contend that assessment and understanding of these relationships is important for addressing budgetary slack unethical behavior, which is widespread in contemporary business. At issue presently is the considerable anecdotal and empirical evidence that suggests that the budgeting process, if not carefully monitored and managed, often produces unintended incentives that may spur employees to unethically "game" the system. This budget gaming may surface in the form of budgetary *slack*, where employees are incentivized by salary and bonus budget performance targets to set such goals at levels *below* what could be considered employee maximum performance (Jensen, 2003). One researcher found that approximately 80 percent of study managers admitted to committing budgetary slack during their careers (Onsi, 1973). In fact, Walker et al. (2012) highlight literature that shows a significant association between financial incentives and budgetary performance that promotes budget gaming in the form of slack creation so that employees may be more likely to secure pay increases and/or bonuses (e.g., Chow et al., 1988; Healy, 1985; Jennergren, 1980; McNabb & Whitfield, 2007; Young, 1985).

In short, budget-based performance standards such as these often encourage unethical budget gaming where managers and employees manipulate and even lie about the budget (Jensen, 2003; Murphy, 2001). More extreme cases have been documented where budgetary gaming becomes increasingly widespread,

as does the severity of the unethical behavior, sometimes resulting in fraud used to meet predetermined performance goals (Jensen, 2003). Other outcomes of budgetary gaming may include employee work performance shirking (Jensen, 2003), as well as other suboptimal behaviors that compromise the budgetary process as a whole (Douglas & Wier, 2000; Dunk & Nouri, 1998; Lukka, 1988). It is noteworthy that budget gaming has also been associated with reduced firm performance and misallocated and inefficient use of resources, including lower return on investment (Bourgeois, 1981; Degeorge et al. 1999; Douglas & Wier, 2000; Jensen, 2003; Walker et al., 2012). We therefore believe that professional and corporate ethics work in concert to deter such negative behaviors. Figure 1 summarizes the study's proposed relationships. Based upon the preceding review of the relevant literature, the following hypotheses specifying the presence of full mediation among the focal variables are presented and tested in this study:

*Hypothesis 1:* Stronger perceptions of professional ethical standards are associated with increased perceptions of corporate ethical values.

*Hypothesis 2a:* Stronger perceptions of corporate ethical values are associated with increased beliefs about a positive budget orientation.

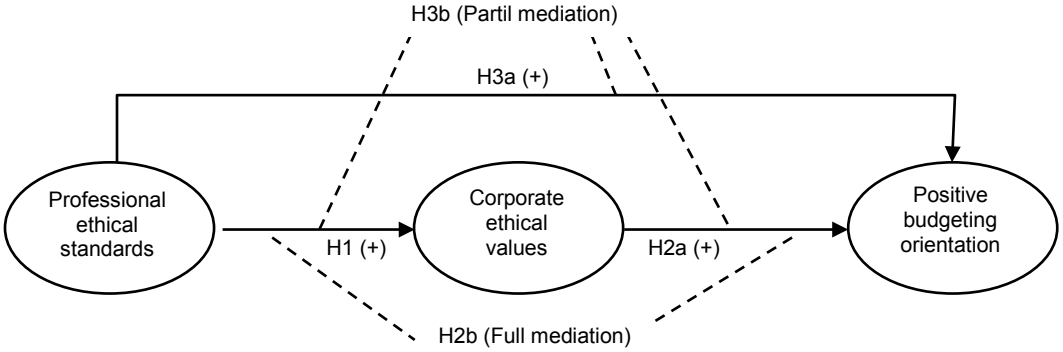
*Hypothesis 2b:* Perceived corporate ethical values fully mediate the relationship between perceived professional ethical standards and beliefs about a positive budget orientation.

In addition, the following hypotheses specifying the presence of partial mediation among the focal variables are presented:

*Hypothesis 3a:* Stronger perceptions of professional ethical standards are associated with increased beliefs about a positive budget orientation.

*Hypothesis 3b:* Perceived corporate ethical values partially mediate the relationship between perceived professional ethical standards and beliefs about a positive budget orientation.

Figure 1: Summary of Hypothesized Relationships




*This figure shows the hypothesized relationships between the three focal variables in the study, namely professional ethical standards (PES), corporate ethical values (CEV), and positive budgeting orientation (PBO), where PES → CEV → PBO. The relationship is most adequately tested using path analysis, also referred to as structural equations modeling (SEM). Here, it is also hypothesized that CEV mediates (or at least partially mediates) the relationship between PES and PBO.*

## DATA AND METHODOLOGY

Information for this investigation was compiled from four separate sources using a self-report questionnaire that contained a variety of ethics and organizational measures. Forty-six completed surveys

were gathered from individuals enrolled in a training seminar offered by a large, regional chapter of the Institute of Management Accountants, while additional completed surveys were collected from individuals attending one of two online MBA programs offered by two different universities, or an on-campus MBA program offered by a large, urban university during the years 2005-2006. In order to enhance the quality of the responses, only individuals who were currently working and had acceptable job experience were asked to complete the questionnaire. Based on these efforts, a total of 290 surveys were secured for use in this investigation of occupational ethics and organizational budgeting.

Participants had an average age of 35.1 years, and a majority were men (65.2 percent), married (71.5 percent), white (79.6 percent), and educated (67.6 percent had either some graduate/professional education or a graduate/professional/doctoral degree). Average position tenure and occupational experience were 4.1 years and 9.6 years respectively, and individuals earned an average of slightly over $75,470 per year in gross (base) salaries. Further, 11.6 percent of individuals were considered line managers, 34.9 percent were middle-level managers, and 15.5 percent were upper-level managers, while many did not supervise employees (38.0 percent). Subjects had an average of just over 8 employees working under their supervision. The professionals worked in varied occupational classifications, including Accounting and Finance (28.3 percent), Information Systems/Engineering (23.1 percent), Operations (16.1 percent), and Marketing/Sales (14.7 percent). Many individuals had limited (37.3 percent) or no budgetary job responsibilities (29.6 percent), while others had significant (18.1 percent) or extensive (15.0 percent) budgetary responsibility. Of the companies represented in the sample, many functioned in the manufacturing/consumer products (34.7 percent), services (14.0 percent, or financial services (12.3 percent) industries. With regard to company size, slightly over 19 percent of the organizations had fewer than 100 employees, 23.4 percent had 100 to 999 employees, 19.2 percent had 1,000 to 9,999 employees, and 38.1 percent had 10,000 or more employees. Based on these demographical characteristics, the study sample appears relatively ideal to test associations dealing with budgetary biasing, since these experienced professionals will likely have experienced budget-related ethical dilemmas some time in their careers.

Measures

Several measures appearing in past research were utilized in this investigation to assess the focal and control variables. In addition, a new scale was developed to measure perceptions of positive budgetary processes. These focal measures are presented in the Appendix. A five-item measure of professional ethical standards was utilized to assess professionals' beliefs about the positive values and practices embedded within a profession (Valentine and Fleischman, 2008b). As a whole, this measure taps critical elements of ethics within a profession, such as developing ethical standards and reprimanding unethical individuals/companies. Items were rated on a seven-point scale comprised of "1-strongly disagree," "2-moderately disagree," "3-slightly disagree," "4-neither agree nor disagree," "5-slightly agree," "6-moderately agree," and "7-strongly agree," with higher item values representing increased professional ethics. The scale's coefficient alpha was 0.88.

A five-item measure developed by Hunt et al. (1989) was used to assess individuals' perceptions of corporate ethical values. This measure has been utilized by many scholars to evaluate to the degree to which companies (and corporate leaders) are actively involved in the management and promulgation of business ethics (e.g., Paolillo & Vitell, 2002; Singhapakdi et al., 1999; Valentine & Barnett, 2007; Valentine et al., 2006). Items were once again rated on a seven-point scale comprised of "1-strongly disagree," "2-moderately disagree," "3-slightly disagree," "4-neither agree nor disagree," "5-slightly agree," "6-moderately agree," and "7-strongly agree," and after reverse scoring two statements, higher item values indicated increased ethical values. The coefficient alpha of the scale was 0.86.

Fifteen items were developed to measure an organization's budgetary orientation in this study, and much

of this development stemmed from current understanding of various budget management practices. These fifteen statements were rated on a seven-point scale comprised of "1-strongly disagree," "2-moderately disagree," "3-slightly disagree," "4-neither agree nor disagree," "5-slightly agree," "6-moderately agree," and "7-strongly agree." A preliminary principal components factor analysis with varimax rotation was used to determine to measurement characteristics of the items, and four factors emerged with initial eigenvalues of 4.34, 1.51, 1.12, and 1.03 respectively and 28.92 percent, 10.07 percent, 7.47 percent, and 6.88 percent of explained variance. Seven items that loaded effectively on the first factor with loading greater than 0.57 were included in a new factor analysis, which yielded a one-factor solution with an eigenvalue of 3.44 and 49.21 percent of explained variance, and factor loadings ranged from 0.65 to 0.75. The items covered such practices as developing motivational budget targets, getting support from top leadership in the budgetary process, using budgets to strengthen value, and including budgets in strategic planning, coordination, and benchmarking activities, actions that collectively represents a positive budgeting orientation. Consequently, higher item scores represented increased positive budgeting, and the coefficient alpha of the measure was 0.83.

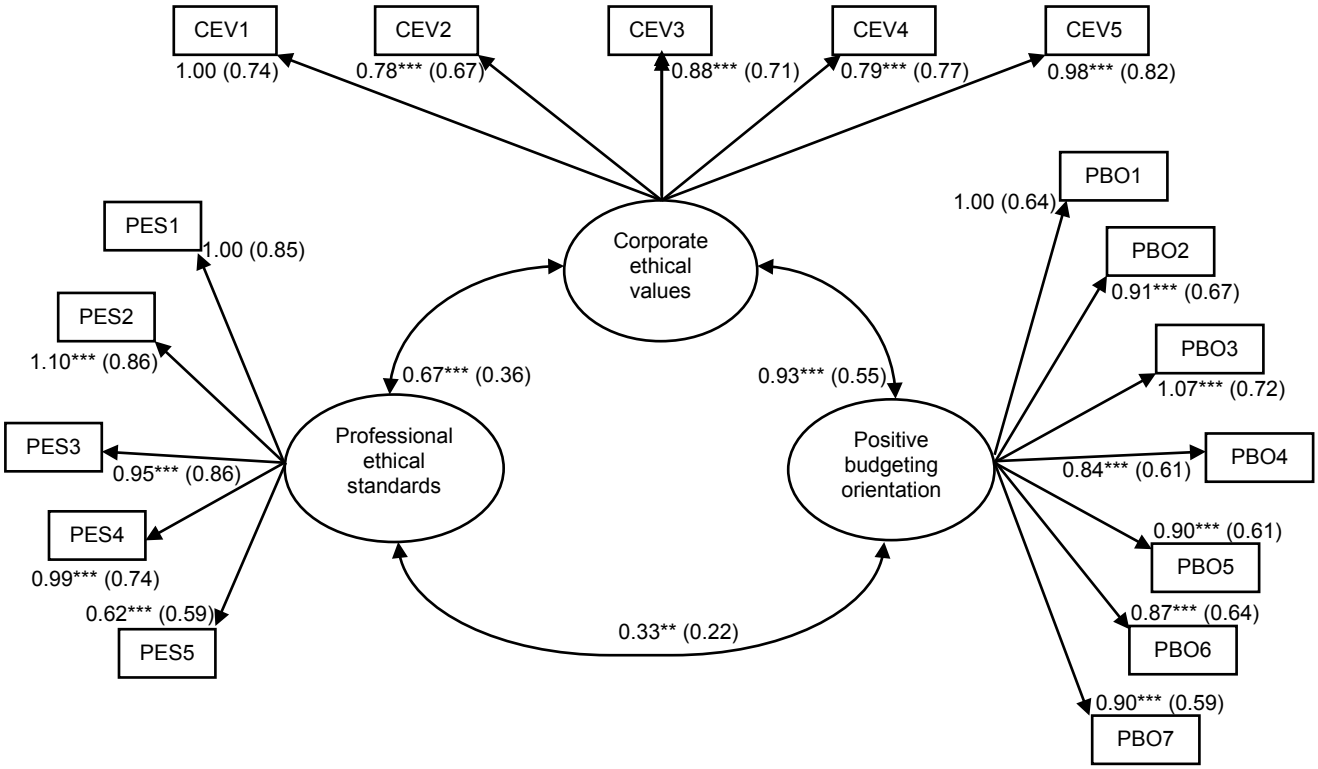
Social desirability was included as a control in the analysis to account for the participants' motivation to provide socially correct responses, a tendency that can often be a concern in ethics research (Randall & Fernandes, 1991). A ten-item version of the Marlowe-Crowne scale was used to account for such bias (Crowne & Marlowe, 1960; Fischer & Fick, 1993; Strahan & Gerbasi, 1972). Sample items include "I have never deliberately said something that hurt someone's feelings," and "I have never been irked when people expressed ideas very different form my own," and statements were rated with "1-False" or "2-True." After reverse scoring five items, values were added together for a possible range of values from 10 to 20, with higher composite scores indicating elevated social desirability.

Using AMOS 6.0, an initial confirmatory factor analysis containing the three focal measures was specified to verify the measurement properties of these scales. Variable descriptive statistics and correlations were then examined in SPSS 12.0 to investigate the relationships among the control and focal variables. Lastly, a structural analysis was conducted in AMOS to test the proposed mediating role of corporate ethical values in the proposed positive relationship between professional ethical standards and a positive budgeting orientation, which required the specification of full mediation and partial mediation structural models (see James & Brett, 1984; James et al., 2006; Schneider et al., 2005).

## RESULTS AND DISCUSSION

The confirmatory factor analysis of the focal variables, which is presented in Figure 2, yielded good fit statistics: $\chi^2 = 257.702$, d.f. = 116, $p < .001$, $\chi^2$ / d.f. = 2.222, NFI = 0.889, IFI = 0.935, CFI = 0.934, RMSEA = 0.065. The items were all significantly related to their associated latent constructs ($p < .001$), and the standardized parameter estimates were greater than 0.50. The professional ethical standards and corporate ethical values variables were positively related (covariance = 0.668, $p < .001$; correlation = 0.362), corporate ethical values was positively related to positive budgeting orientation (covariance = 0.929, $p < .001$; correlation = 0.555), and professional ethical standards were positively related to positive budgeting orientation (covariance = 0.325, $p < .01$; correlation = 0.220).

Figure 2: Results of Confirmatory Factor Analysis




*The figure shows the results of the confirmatory factor analysis. The confirmatory factor analysis represents the final stage of the structural equations modeling (SEM) process which is also sometimes referred to as path analysis. In short, the above figure displays the statistically significant results that relate from the two-way relationships between the three focal variables in the study, namely corporate ethical values (CEV), professional ethical standards (PES) and positive budgeting orientation (PBO). In the above figure standardized estimates/correlations are presented in parentheses. *** and ** indicate significance at the 0.001 and 0.01 (0.1 and 1.0 percent) levels, respectively.*

Using the standardized regression weights (see Hair et al., 1998), composite reliability scores for professional ethical standards, corporate ethical values, and positive budgeting orientation were 0.89, 0.86, and 0.83 respectively, and the variance-extracted estimates were 0.62, 0.55, and 0.41, which demonstrated adequate measurement properties. Additionally, the variance-extracted estimates were all higher than the squared correlations among the unobserved variables, providing evidence of discriminant validity (see Fornell and Larcker 1981). A single-factor test, originally proposed by Harman (1967), was also specified to determine whether common method bias was an issue in this study (see Podsakoff et al., 2003). After loading all of the observed items on one latent construct, the model produced poor fit statistics ($\chi^2$ = 1195.064, d.f. = 119, $p < 0.001$, $\chi^2$ / d.f. = 10.043, NFI = 0.483, IFI = 0.509, CFI = 0.502, RMSEA = 0.177), which suggested that common method bias was not present in this investigation.

The variable descriptive statistics for the focal and control variables and associated correlations are presented in Table 1. The mean values for the professional ethical standards, corporate ethical values, and positive budgeting orientation variables indicated that the professionals believed their organizations and professions were relatively well-managed from both ethical and budgetary perspectives. The mean value for social desirability indicated that individuals were influenced by only modest impression management. Positive budgeting orientation was positively related to corporate ethical values and professional ethical standards, and corporate ethics was positively related to professional ethics. These findings suggest that ethical environments in both professions and companies are associated with enhanced budgetary

practices. Finally, the social desirability scale was not related to any of the focal variables, which indicated that such bias was not a major concern in this study.

Table 2: Variable Descriptive Statistics and Correlations

| Variable | *M* | *SD* | *N* | 1 | | 2 | | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|
| 1. Professional ethical standards | 5.69 | 1.26 | 289 | -- | | | | | |
| 2. Corporate ethical values | 5.48 | 1.39 | 287 | 0.33 | *** | -- | | | |
| 3. Positive budgeting orientation | 4.84 | 1.18 | 279 | 0.20 | *** | 0.48 | *** | -- | |
| 4. Social desirability | 14.93 | 2.03 | 284 | 0.04 | | 0.01 | | -0.03 | |
| | | | | | | | | | - |

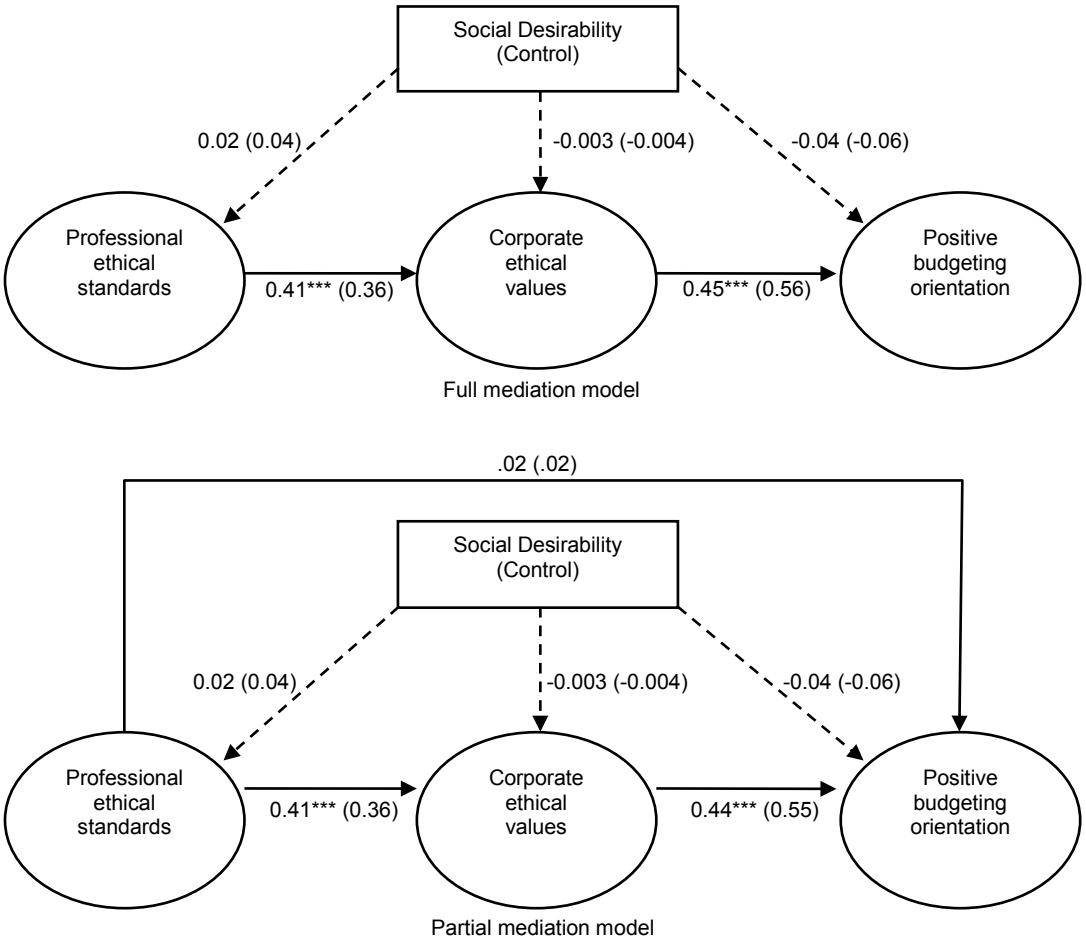
*This table shows the descriptive statistics, including means and standard deviations, as well as the correlations for the three focal variables in the study, along with the social desirability control variable. ***indicates significance at the 0.001 level (0.1 percent). None of the other correlations were significant at $p < 0.10$. The table highlights that there are strong correlations among the three focal variables professional ethical standards (PES), corporate ethical values (CEV), and positive budgeting orientation (PBO). It is noteworthy that social desirability bias does not seem to be a problem in this study as evidenced by the lack of significance associated with this variable.*

The findings associated with the mediated regression analysis are summarized in Figure 3. The full mediation model displayed acceptable fit statistics ($\chi^2 = 264.829$, d.f. = 131, $p < 0.001$, $\chi^2$ / d.f. = 2.022, NFI = 0.886, IFI = 0.939, CFI = 0.938, RMSEA = 0.059), the items were positively related to the latent variables ($p < 0.001$), and the standardized regression weights were all above a value of 0.50. Professional ethical standards were associated with increased corporate ethical values, which provided adequate statistical support for Hypothesis 1. Corporate ethics was also associated with increased positive budgeting, thereby providing adequate support for Hypotheses 2a and 2b. None of the focal variables in the model were associated with the social desirability measure. These results suggested that professional ethics operates through corporate ethics to influence positive budgeting, but the specification of a partial mediation model was necessary to support this assertion. The partial mediation framework also provided sound fit statistics ($\chi^2 = 264.688$, d.f. = 130, $p < .001$, $\chi^2$ / d.f. = 2.036, NFI = 0.886, IFI = 0.939, CFI = 0.937, RMSEA = 0.060). Once again, the items were positively related to the latent variables ($p < 0.001$), and the standardized regression weights were all above 0.50. Professional ethical standards were positively related to corporate ethical values, ethical values were positively related to a positive budgeting orientation, and professional ethical standards and positive budget orientation were unrelated. The social desirability measure was also unrelated to the focal variables. A chi-square difference test indicated that the partial mediation model was not significantly better than the full mediation model ($\chi^2$ difference = 0.141, d.f. difference = 1), showing that corporate ethics fully mediated the positive relationship between professional ethics and positive budgeting. Further support was therefore provided for Hypotheses 2a and 2b, and Hypotheses 3a and 3b were not supported.

## CONCLUDING COMMENTS

Our findings showed a positive association between individuals' perceptions of professional ethical standards and their perceptions of corporate ethical values (support provided for Hypothesis 1). In addition, a positive relationship was identified between perceived corporate ethical values and a positive budgeting orientation practiced by employers (support provided for Hypotheses 2a and 2b). Perceptions of professional ethical standards and a positive budgeting orientation were unrelated in the presence of the other focal variable (support not provided for Hypotheses 3a and 3b). Overall, the findings indicated that ethical environments in both professions and organizations should trigger enhanced ethical budgetary practices. However, corporate ethical values appear to fully mediate the positive relationship between professional ethical standards and a positive budgeting orientation. In other words, professional ethics operates through corporate ethics to indirectly influence a positive budgeting orientation.

Figure 3: Results of Mediation Analysis




*The figure shows the results for the full mediation model (above) as well as the partial mediation model (below the full mediation model) where standardized estimates are presented in parentheses (measurement models not shown). *** indicates significance at the 0.1 percent levels respectively. In sum, the above figure displays that professional ethical standards (PES) were positively associated with corporate ethical values (CEV), and CEV was positively associated with positive budgeting orientation (PBO), but PES was not statistically related to PBO. Therefore, CEV both partially mediates and fully mediates the relationship between PES and PBO. A chi-square difference test indicated that the partial mediation model was not significantly better than the full mediation model, which underscores the contention that CEV fully mediates the positive relationship between PES and PBO.*

Ultimately, the findings support the idea that corporate ethical values are the catalyst to a positive budget orientation through managerial ethical action and support of the budgeting process, suggesting a tight interconnection between the two factors. Managerial action and support are therefore key drivers in an organizational environment to set the "tone at the top" (Cohen et al., 2007). For example, the domain of corporate ethics focuses on managerial ethical deportment and behavioral *actions*, which tie directly to implicit managerial support of an ethically healthy budgetary environment. Managers cannot *support* an ethical environment if they do not personally act in an ethical manner, and such ethical conduct is necessary for effective and sufficient support of a positive budgeting orientation. As mentioned previously, professional ethics help augment corporate ethics through occupational guidelines and monitoring that reinforces ethical work conduct, ultimately strengthening the ethical context.

The fact that our findings identify corporate ethical values as the mediating construct between professional ethics and positive budgeting demonstrates further the contention that organizational ethical context should be strategically managed. In particular, the rampant incidence of unethical slack creation

in connection with the budgeting process may likely be curtailed by systematically enhancing the ethical context with effective ethics programs. The budgetary ethics literature is supportive of this idea that ethical context is needed to mitigate unethical budgetary biasing and slack creation by creating an environment that discourages these behaviors through peer pressure and positive norms (e.g., Douglas & Wier, 2000; Stevens, 2002; Wakefield, 2008; Wong-On-Wing & Gladie, 2007).

Valentine and Fleischman (2008a) suggest a number of ethics programs to institutionalize an ethical context. For example, using ethics codes, effective communication, and ethics training should collectively improve employee moral reasoning and invigorate the "ethical focus and culture of the organization" (Valentine & Fleischman 2008a, p. 167). It is also necessary to tailor training workshops and role-playing so that key ethical issues and concerns are covered (Sims, 1991; Trevino, 1986; Valentine & Fleischman, 2008a). In the present context, workshops should involve realistic budget-based moral dilemmas tied to slack creation opportunities. As a pragmatic matter, management should be careful to minimize budget construction that indirectly incentivizes employees to create slack. In that vein, the competitive environment should be somewhat tempered so that employees do not feel compelled to cheat in order to survive. This study contributes to the business ethics literature in general, and to the field of budgetary ethics in particular, by demonstrating that perceived corporate ethical values fully mediate the linkage between perceived professional ethical standards and a positive budget orientation.

The study is also pragmatically useful to companies wishing to minimize budgetary slack creation through the institutionalization of an effective ethical context with positive business values. Furthermore, this is the first study that identifies relationships among the professional ethical standards, corporate ethical values, and positive budgeting orientation constructs. We assert that a better understanding of these linkages is essential for addressing budgetary slack unethical behavior that has dominated the workplace for nearly half a century. Future research can build on this framework as scholars continue to pursue remedies to curtail incidences of budgetary slack.

Although we contend this research contributes to the budgetary ethics literature, we wish to address limitations of the study. The survey was gathered using a convenience sample, so self-selection bias may exist because respondents may possess greater altruism and interest in the topic than the population as a whole. In addition, most of the respondents were graduate students, but their extensive work experience mitigates this concern (occupational tenure was just under 10 years with an average of eight subordinates). Our particular sample was primarily comprised of educated white professionals who work in the business sub-disciplines at relatively large organizations that would likely experience budgeting ethical dilemmas firsthand, so caution should be used to not generalize our findings to other demographic/professional groups. As with most ethics-oriented empirical research, social desirability bias was a concern. However, we controlled for this tendency, and the associations with the focal variables were insignificant. As with any survey, common method bias is also a concern. Yet, we also tested for such bias and concluded that it was likely not a problem.

Finally, we did not wish to imply causality with any of our assertions/conclusions.Based on our findings, we suggest that scholars include constructs for professional ethics, corporate ethics, and positive budgeting in future research dealing with budgetary slack unethical behaviors. Budgetary biasing vignettes could be assessed in conjunction with these three focal variables with more diverse samples to further push the literature. Finally, multiple-year case study research employing a number of corporations could be used to observe the interaction of the three constructs in diverse, longitudinal, real-world settings.

## APPENDIX

Focal Measures

| |
|---|
| **Professional Ethical Standards** |
| PES1. I believe that my profession is guided by high ethical standards. |
| PES2. My profession reprimands individuals and companies that behave unethically. |
| PES3. Individual and organizational ethical standards are supported in my profession. |
| PES4. My profession encourages continued ethical development and training. |
| PES5. I believe that people in my profession conduct business in an ethical manner. |
| **Corporate ethical values** |
| CEV1. Managers in my organization often engage in behaviors that I consider to be unethical. (R) |
| CEV2. In order to succeed in my organization, it is often necessary to compromise one's ethics. (R) |
| CEV3. Top management in my organization has let it be known in no uncertain terms that unethical behaviors will not be tolerated. |
| CEV4. If a manager in my organization is discovered to have engaged in unethical behavior that results primarily in *personal gain* (rather than organizational gain), he or she will be promptly reprimanded. |
| CEV5. If a manager in my organization is discovered to have engaged in unethical behavior that results primarily in *organizational gain* (rather than personal gain), he or she will be promptly reprimanded. |
| **Positive budgeting orientation** |
| PBO1. My organization's budget motivates individuals to take actions that maximize value for customers and shareholders. |
| PBO2. Upper-level management in my organization strongly supports and believes in the budgeting process as a whole. |
| PBO3. My organization's budget is based on departmental improvements in close agreement with broad strategic objectives. |
| PBO4. My organization's budgets are linked through central coordination of annual departmental and business unit budgets. |
| PBO5. My organization does control performance against trends, leading indicators, and rolling forecasts. |
| PBO6. My organization's budget process does create value for my organization. |

*This table shows the specific items that compose the constructs for the three focal variables professional ethical standards (PES), corporate ethical values (CEV), and positive budgeting orientation (PBO), where (R) = reverse coded items.*

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# VOLUNTARY FAIR VALUE DISCLOSURES BY BANK HOLDING COMPANIES: THE ROLE OF SEC DEAR CFO LETTERS

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**ABSTRACT**

*The SEC's Division of Corporate Finance sent "Dear CFO" letters to certain registrants in 2008 requesting voluntary disclosures to improve transparency of Level 3 fair value measures and valuation of financial instruments in inactive or illiquid markets. We expect these bank holding companies were among the companies that the Division of Corporate Finance targeted. We consider the discussion points from the Dear CFO letters to identify the disclosures to analyze in this study. We find that disclosures about valuation techniques and the use of broker quotes or prices from pricing services are associated with increased information asymmetry and disclosures about the use of market indices or illiquidity adjustments are associated with decreased information asymmetry. When interacted with Level 3 assets, disclosures about changes in valuation techniques intensify the positive relation between Level 3 assets and information asymmetry and disclosures about asset-backed securities mitigate the positive relation between Level 3 assets and information asymmetry. Our study provides insight about the types of disclosures that impacted information asymmetries during the financial crisis. However, this setting of uncertainty and use of a small sample size may limit the ability to generalize these inferences to other time periods or other financial firms.*

**JEL:** G21, M41

**KEYWORDS:** Voluntary Disclosure, Fair Value Accounting, Information Asymmetry

## INTRODUCTION

At the height of the recent financial crisis, U.S. public companies transitioned to a new fair value accounting standard, SFAS-157. The new standard provided a definition of fair value that companies would apply to measure certain financial assets and liabilities that companies had reported at fair value based on prior standards. Companies must measure fair value in a way that is consistent with the price that market participants would pay to sell the asset or transfer the liability in orderly markets. Companies must also classify fair value measures according to a hierarchy in which the least reliable category (Level 3) reflects the use of significant unobservable inputs. Application of SFAS-157 at a time when the U.S. capital market was relatively illiquid (with trading frozen for many of the complex financial instruments at the heart of the crisis) fueled opposition to and criticism of the standard.

Regulators engaged in many efforts to support lending and restore liquidity. In addition, the SEC's Division of Corporate Finance (the Division) identified registrants with relatively higher levels of fair valued financial instruments, particularly asset-backed securities, loans, and derivatives. The Division expected that such registrants would be using significant unobservable inputs in their fair value measurements of these financial instruments. The Division sent "Dear CFO" letters to these registrants during March 2008 and identified certain "discussion points" that it asked the registrants to address in the Management Discussion and Analysis section of their financial reports. The Division continued to engage these

registrants by sending them a second Dear CFO letter in September 2008, which focused on fair value measures of financial instruments that were not actively trading at the time.

In this study, we hand collect voluntary disclosures that reflect the Division's recommended discussion points from a sample of the eighteen largest U.S. bank holding companies (BHC). We expect that the Division sent the Dear CFO letters to these companies. The goal of our study is two-fold. First, we determine the frequency and extent to which these eighteen banks, in the midst of the 2007 financial crisis, adhered to the unprecedented explicit guidance from the SEC in its request for voluntary disclosures. Second, we assess whether such voluntary disclosures are associated with changes in firms' information asymmetries. We hand collect 20 individual disclosure items reflected in the Division's Dear CFO letters of March and September 2008. The items include two disclosures that the Division did not reflect in the stated discussion points; however, the Financial Accounting Standards Board (FASB) updated fair value disclosure requirements through its ASU No. 2010-06 to require these items effective January 2010.

To examine whether voluntary disclosure triggered by regulatory guidance is associated with information asymmetry, we apply factor analysis to reduce individual disclosure items to eight common factors that represent the underlying disclosure constructs: (1) use of broker quotes or prices from pricing services, (2) changes in valuation, (3) valuation techniques, (4 ) additional disclosures about Level 3 values that became mandatory after the sample period, (5) the significant judgment management applied, (6) asset-backed securities, (7) sensitivity analyses, and (8) market indices and illiquidity. Our main multivariate empirical model is an OLS estimation of a proxy for information asymmetry regressed on our voluntary disclosure factor variables. We control for firm characteristics. We also including the Level 1, 2, and 3 assets/liabilities, thus mitigating potential concerns that our inferences may arise from the values of the assets/liabilities themselves, rather than from the *voluntary disclosure* of them.

We find in our initial model estimate that disclosures about valuation techniques and the use of broker quotes or prices from pricing services are associated with increased information asymmetry, while disclosures about whether the determination of fair value measures reflected market indices and illiquidity are associated with decreased information asymmetry. Using an alternative specification of our main model, we also provide evidence of joint effects of SFAS-157 voluntary disclosures and the extent of Level 3 assets the entity held on information asymmetry. Disclosures about changes in valuation techniques intensify the positive relation between Level 3 assets and information asymmetry and disclosures about asset-backed securities mitigate the positive relation between Level 3 assets and information asymmetry.

Our study extends other studies that examine the association between market-to-market accounting in the banking sector and information asymmetry (Ball, Jayaraman, and Shivakumar, 2012) and SFAS-157 fair value measures in the banking sector and information asymmetry (Liao, Kang, Morris, and Tang, 2013) in that we assess the incremental effect of voluntary disclosure. We further extend the one known study that examines the relation between voluntary fair value reliability disclosures and market outcomes (Chung, Goh, Ng, and Yong, 2014) because our study identifies voluntary fair value disclosures based on explicit guidelines that the SEC provided registrants in its 2008 "Dear CFO" letters.

Our findings should be of interest to auditors and regulators, particularly as the FASB proceeds in its decision process to improve disclosures of fair value measurements. Additionally, we contribute to the academic literature that seeks to understand whether voluntary disclosure provides benefits to market participants. This literature includes studies in which the researcher applies judgment to develop a disclosure score (e.g., Botosan, 1997) or employ disclosure scores developed by market participants (e.g., Association for Investment Management and Research and the Report of the Financial Analysts Federation's Corporate Information Committee). In this study we consider disclosure items that regulators explicitly associate with improved transparency of fair value disclosure measures. We organize this paper as follows. In the next section, we discuss the role of fair value accounting during the financial crisis. In the

third section we review the related literature and state our main hypothesis. In the fourth section we discuss data and methodology. We then provide results and in the last section our concluding remarks.

Background

The period from the 1990s through 2006 in which U.S. housing prices steadily increased, fueled the expectation that housing prices would continue to rise, bringing many new buyers to the market. Buyers who would not have met traditional lending criteria could buy a home as lenders loosened mortgage loan standards and offered a new class of adjustable rate mortgage loan products. Loan originators repackaged debt into tradable securities and other financial instruments (ranging from asset-backed securities such as residential or commercial mortgage-backed securities (MBS) to more complex, tranched securities such as collateralized debt and collateralized mortgage obligations). These securitizations provided the investment funding to support subprime lending to new riskier borrowers.

The first indicators of the U.S. credit crisis emerged in early 2007. As the housing bubble burst and defaults of underlying loans increased, Freddie Mac announced that it would stop buying risky subprime MBS. Freddie Mac and other government sponsored entities had provided investors protection against default risk of these subprime loans. Ratings agencies downgraded the ratings of financial instruments backed by subprime mortgages. Countrywide Financial, a leading issuer of MBS, reported a 54 percent year over year decline in its 2007 second quarter pre-tax earnings due to increased credit costs and increased provision for credit losses. As the value of subprime MBS declined significantly, the investment funds and other entities holding these securities suffered severe declines in the value of their assets, spreading the problems in the housing market throughout the financial sector, both domestic and global.

Entities began complying with SFAS-157, prospectively to their first fiscal year beginning after November 15, 2007 (for recurring financial assets and liabilities). The new fair value guidance established one consistent definition of fair value for entities to apply to any balance sheet element that had already required fair value measurement under existing standards. This fair value definition is market-based and requires entities to measure fair value from the perspective of market participants as a current exit price. The guidance also established a fair value hierarchy in which management classifies recognized financial assets and liabilities based upon the degree of observability of the significant inputs management applies to determine the fair value measure. Level 1 of the hierarchy consists of asset/liability valuations in which the significant input to the valuation is directly observable market trading prices. Level 2 reflects asset/liability valuations in which the significant input is indirectly observable (e.g., market prices for similar assets/liabilities). Level 3 consists of asset/liability values in which the significant input is unobservable (the entity uses a valuation model). The intent of this hierarchy is to provide market participants with more information about the relative reliability of fair value measures, with the potential for market participants to assess Level 3 measures using unobservable inputs as the least reliable.

There had been ongoing debate about fair value measurement but the criticisms intensified as entities began complying with SFAS-157 at the height of the credit crisis and related to three main issues. One issue is that of procyclicality; as BHCs apply an exit price in disorderly and inactive markets, BHCs would be required to reduce asset values to lower fair values, producing losses that would reduce their regulatory capital. To increase capital, banks would need to sell assets in a depressed market, creating additional downward pressure on the prices of their assets. However, Laux and Leuz (2010) point out that banks which operate primarily in the lending business may classify loans as held-for-investment, which they report on their balance sheets at amortized cost. In addition, under SFAS -115, entities are also required to report loans held to maturity at amortized cost. The authors note that "for the 31 bank holding companies that failed and were seized by U.S. bank regulators between January 2007 and July 2009 loans accounted for roughly three-quarters of their balance sheets." The authors conclude that fair value accounting did not contribute to the plummeting values of BHCs financial assets.

A second issue is the contention that the decreases in fair value likely reflected the lack of liquidity in an inactive market rather than the present value of future cash flows if the entity could hold the asset until market conditions improved. A third main issue relates to the significant judgment that management must apply to determine the significant unobservable valuation inputs, classify financial instruments as Level 3, and apply the most appropriate valuation model to arrive at Level 3 fair value estimates. Management judgment may be biased and management may measure Level 3 financial instruments opportunistically to manage earnings or to remain within regulatory capital requirements. Kothari and Lester (2013) consider this issue as they assert that accounting for securitizations (including fair value measures of mortgage servicing rights, interest only strips, and residual interests) contributed to the financial crisis.

They state: "In effect, the financial statements for originators and securitizers likely reflected overstated net income due to securitization gains; overstated asset balances due to incorrectly estimated MSRs, IO interests, and residual interests; and understated liability balances for repurchase obligations and loan loss reserves. Economically, this accounting implies that the value of the various parts when securitized exceeded the value of the original loan." Of particular interest to this study is the effort by regulators to restore investor confidence in reported financial instrument asset and liabilities values of entities in the financial sector and restore liquidity through expanded (voluntary) disclosure—particularly that of SFAS-157 recognized fair value measures. In March and again in September 2008, the Division of Corporation Finance of the SEC, via what are now commonly referred to as its "Dear CFO" letters, contacted certain public companies whom it determined had reported significant amounts of Level 3 financial instruments (e.g., asset-backed securities, fair valued loans, and derivative instruments). In its March 2008 letter, the Division requested voluntary disclosure about Level 3 fair value measurements, particularly if the entity deemed its reported Level 3 valuations to be material. In its September 2008 letter, the Division requested voluntary disclosure related to fair value measures of financial instruments in inactive markets.

In its December 2008 Report to Congress pursuant to Section 133 of the Emergency Economic Stabilization Act, the SEC opposed the suspension of SFAS-157 or SFAS-159 (the fair value option). A suspension would have removed access to information at a time when investors likely found the information to be most useful. In preparing its report, the SEC conducted numerous forums to elicit feedback on fair value accounting from investors and other financial statement users (e.g., FASB Exposure Draft comment letters, SEC roundtables, and other public statements). The SEC concurred with market participants' calls for more comprehensive fair value disclosures particularly with respect to the inputs used, underlying assumptions employed by management to arrive at Level 3 estimates, and sensitivity of those estimates to changes in the assumptions used. In this section, we have addressed key aspects of the financial crisis and the manner in which the concurrent implementation of SFAS-157 may have influenced critical outcomes. The SEC actions and its 2008 Report to Congress clearly illuminate the importance of expanded voluntary disclosure as a means to reduce investor uncertainty and information asymmetry related to the risk of complex financial instruments. In the next section we discuss the findings of academic literature with respect to the role of voluntary disclosure to reduce information asymmetry, and the relative transparency of recognized or disclosed fair value measures prior to and post compliance with SFAS-157.

## RELATED LITERATURE AND EMPIRICAL PREDICTION

Information asymmetries between the firm and outside investors create the classic adverse selection or lemons problem. Credible disclosure enables investors to discern good assets from lemons which reduces information asymmetry and improves liquidity of firms' securities (Akerlof, 1970, Diamond and Verrecchia, 1991, Balakrishnan, Billings, Kelly, and Ljunqvist, 2014). Several empirical studies find evidence consistent with this theory. They document that higher quality disclosures improve analyst forecast accuracy, reduce analyst forecast dispersion and forecast revision volatility, and attract a greater analyst following (e.g., Lang and Lundholm, 1996, Botosan, 1997). Brown and Hillegeist (2007) find that the quality of firms' disclosures reduces the incentives investors have to search for private information.

However, disclosures do not unambiguously decrease information asymmetry in that informed investors have superior ability to process and apply disclosures to judgments about the value of the firm's assets compared to that of uninformed investors (e.g., Kim and Verrecchia, 1994, Amiram, Owens, and Rozenbaum, 2012). Several studies examine the value relevance of estimated fair values disclosed by banks under SFAS-107 which required the entity to disclosure fair value estimates in addition to current carrying values of the financial instruments. Barth, Beaver, and Landsman (1996) document that disclosed fair value loan measures are value relevant, but do not fully reflect loan default and interest rate risk.

Eccher, Ramesh, and Thiagarajan (1996) provide evidence of the value relevance of investment securities but in limited settings, while Nelson (1996) fails to find support for her hypothesis that SFAS 107 estimates have incremental explanatory power for securities prices. Ball, Jayaraman, and Shivakumar (2012) examine the information asymmetry effects of SFAS-115 fair value accounting for investments by banks. The standard reflects a mixed attributes model in that trading investments are marked-to -market with both realized and unrealized gains or losses recognized in income, available for sale investments are marked to market but unrealized gains or losses are deferred to accumulated other comprehensive income, while loans held to maturity are valued at amortized cost over the term of the loan. The authors document a significant increase in information asymmetry related to trading securities but not available for sale investments. The increase in information asymmetry relates to recognition rather than information effects of investors having more timely information about gains and losses on trading investments.

Post compliance with SFAS-157, Song, Thomas, and Yi (2010), Kolev (2008), and Chung, Goh, Ng, and Yong (2014) examine the value relevance of the Levels 1, 2, and 3 of the fair value hierarchy, generally finding that value relevance decreases as the relative opacity of the financial instruments increases (from Level 1 to Level 3). Riedl and Serafeim (2011) document that non-diversifiable information risk (the firm's equity beta) increases monotonically from Level 1 to Level 3 as does information asymmetry (Liao et al., 2013). While these studies examine all financial instruments at fair value in a specific level of the fair value hierarchy, in contrast, Altamuro and Zhang (2013) focus on the differential impact of Level 2 compared to Level 3 fair value measures of mortgage servicing rights only.

The authors find that for this particular asset, the valuation multiple of Level 3 (Level 2) fair values is positively related (not related) to the persistence of future servicing fee cash flows. In addition, the valuation multiples of Level 3 (Level 2) mortgage servicing rights are negatively (unrelated) to measures of prepayment and default risk. The authors conclude that Level 3 measures more appropriately reflect the underlying economic characteristics of mortgage servicing rights. Chung, Goh, Ng, and Young (2014) examine the value relevance of voluntary disclosures of the controls and processes managers employ to provide reliable fair value disclosures, and find that such disclosures increase the value relevance of Level 3 but not Level 1 or Level 2 assets. Similarly, reliability disclosures mitigate information risk of Level 3 assets but not Level 1 or Level 2 assets. In the background section above, we discuss that the SEC considered voluntary disclosure to be an important measure to restore investor confidence in fair value measures, particularly Level 3 model estimates and fair value measures derived from illiquid markets. As part of its report pursuant to the Emergency Economic Stabilization Act, the SEC stated:

"Considering the available evidence regarding the usefulness of fair value information to investors, the suspension of fair value to return to or introduce historical cost-based measures would likely increase investor uncertainty and reduce investor confidence. This greater uncertainty would likely adversely impact the values of debt and equity securities. In addition, this greater uncertainty would potentially increase the degree of information asymmetry among market participants, further adversely affecting market liquidity." However, these benefits are not a foregone conclusion. In this literature review, we find that scholars have yet to reach a consensus on whether fair value accounting, in general, provides a net benefit to investors or whether SFAS-157 exacerbated the financial crisis. The value relevance studies prior to SFAS-157 provide mixed evidence on the value relevance of disclosed fair values, while Ball et al., 2012 document that fair

values of recognized trading securities are related to increased information asymmetries (although not excluding that disclosure could reduce the unexplained information asymmetry) . While Chung et al. (2014) provide evidence that voluntary disclosure increases value relevance and reduces information risk of Level 3 assets, the particular disclosures examined were based on researcher choice and their disclosure measure is an indicator variable which may reflect noise or measurement error. Though the SEC called for disclosure to reduce information asymmetry and improve financial reporting transparency, this remains an empirical question. We therefore state our main empirical prediction in null form:

*There is an association between voluntary fair value disclosures related to SFAS-157 fair value measures and information asymmetries.*

## DATA AND METHODOLOGY

We select the 18 largest BHCs as our sample firms since we expect that the SEC targeted these firms through their "Dear CFO" letters by virtue of the BHCs size, importance to U.S. capital markets, and the materiality of their Level 3 financial instruments. We examine the time series of nine consecutive quarters starting with Q1 of 2007 through Q1 of 2009. We start with Q1 of 2007 because 5 of the entities voluntarily adopted SFAS-157 early. We require Compustat and CRSP data to measure the variables we include in our models. Our final sample consists of 162 firm-quarter observations. In Table 1, we provide a list of the sample firms.

Table 1: Sample Firms

| | |
|---|---|
| 1 | JP Morgan Chase |
| 2 | Citigroup |
| 3 | Bank of America (not including Merrill Lynch) |
| 4 | Wells Fargo |
| 5 | Goldman Sachs |
| 6 | Morgan Stanley |
| 7 | MetLife |
| 8 | PNC Financial Services |
| 9 | U.S. Bancorp |
| 10 | Bank of New York Mellon |
| 11 | Sun Trust Banks |
| 12 | State Street |
| 13 | Capital One Financial Corp. |
| 14 | BB&T |
| 15 | Regions Financial Corp. |
| 16 | American Express |
| 17 | Fifth Third Bancorp |
| 18 | KeyCorp |

*This table provides a list of the 18 largest bank holding companies that are included in the sample. We hand collect the voluntary disclosures from the 10-Q's and 10-K's of these companies starting with the first quarter of 2007 and ending with the first quarter of 2009. We identify voluntary disclosures based upon explicit guidance from the SEC taken from their 2008 "Dear CFO" letters. The BHCs that chose to adopt SFAS -157 early are JP Morgan Chase, Citigroup, Bank of America, Morgan Stanley, and Goldman Sachs.*

### BHCs Voluntary Disclosure Data

We provide a list of the individual disclosure items in Table 2, using text taken directly from the Division's "Dear CFO" letters. The March 2008 "Dear CFO letter" was primarily concerned with the significant judgment management must apply in the use of unobservable inputs to determine fair value measures and the possible impact of such measures on the entities' operating results, liquidity and capital resources.

Table 2: Individual Disclosure Items

| Item No. | Description of Disclosure Item |
|---|---|
| 1 | The nature and type of assets underlying any asset-backed securities, for example, the type of loans (sub-prime, Alt-A, or home equity lines of credit) and the years of issuance, as well as information about the credit ratings of the securities, including changes or potential changes to those ratings. |
| 2 | A general description of valuation techniques or models you used with regard to your material assets or liabilities (regardless of how you have classified your assets and liabilities within the SFAS-157 hierarchy). |
| 3 | Discuss any material changes you made during the reporting period to those techniques or models (item 2 above), and why you made them. |
| 4 | To the extent possible, provide the quantitative effect of those changes (item 3 above). |
| 5 | A discussion of how you validate the techniques or models you use. For example, you may wish to discuss whether and how often you calibrate the technique or models to market, back-test, or otherwise validate it. |
| 6 | A discussion of how sensitive the fair value estimates for your material assets or liabilities are to the significant inputs the technique or model uses. For example, consider providing a range of values around the fair value amount you arrived at to provide a sense of how the fair value estimate could potentially change as the significant inputs vary. To the extent you provide a range, discuss why you believe the range is appropriate, identifying the key drivers of variability, and discussing how you developed the inputs you used in determining the range. |
| 7 | To the extent material, a discussion of the extent to which, and how you used or considered relevant market indices, for example ABX or CMBX, in applying the techniques or models you used to value your material assets or liabilities. Consider describing any material adjustments you made during the reporting period to the fair value of your assets or liabilities based on market indices and your reasons for making those adjustments. |
| 8 | An explanation of how credit risk is incorporated and considered in the valuation of assets or liabilities. |
| 9 | The significant judgments you made in classifying a particular financial instrument in the fair value hierarchy. |
| 10 | Explain how your credit risk affected your valuation of derivative liabilities and the resulting gain or loss that you included in earnings relating to the changes in that credit risk |
| 11 | Explain how counterparty credit risk affected your valuation of derivative assets and the resulting gain or loss that you included in earnings relating to the changes in that credit risk. |
| 12 | When financial instruments are affected by the lack of market liquidity (i.e. inactivity), how the lack of liquidity impacted the valuation technique you used, and how you factored illiquidity into your fair value determination of those financial instruments. |
| 13 | The nature and amount of assets you valued using broker quotes or prices you obtained from pricing services, along with the classification in the fair value hierarchy. |
| 14 | The number of quotes or prices you generally obtained per instrument, and if you obtained multiple quotes or prices, how you determined the ultimate value you used in your financial statements. |
| 15 | Whether, and if so, how and why, you adjusted quotes or prices you obtained from brokers and pricing services. |
| 16 | The extent to which the brokers or pricing services are gathering observable market information as opposed to using unobservable inputs and/or proprietary models in making valuation judgments and determinations. |
| 17 | Whether the broker quotes are binding or non-binding. |
| 18 | The procedures you performed to validate the prices you obtained to ensure the fair value determination is consistent with SFAS-157, *Fair Value Measurements*, and to ensure that you properly classified your assets and liabilities in the fair value hierarchy. |
| | ***Additional disclosures requirements imposed after the sample period.*** |
| 19 | Disaggregation of items (i.e., purchases, sales, issuances, and settlements) in Level 3 tabular reconciliation. |
| 20 | Policy to determine when transfers between levels are recognized. |

*This table provides a description of the individual voluntary disclosure items (items 1 through 18) using text taken directly from the SEC Division of Corporate Finance "Dear CFO" letters. The list of disclosure items includes items 19 and 20. Though not requested by the Division, the FASB updated fair value disclosure requirements through its ASU No. 2010-06 making disclosure of these items mandatory effective January 2010. These items were voluntary during the period of this study.*

The requested disclosures sought more information about matters including the nature of assets underlying asset-backed securities, descriptions of valuation techniques, the use of market indices, and validation and sensitivity analyses. The September 2008 "Dear CFO letter" was primarily concerned with managements' judgments, assumptions, and valuation inputs related to fair value measurement of financial instruments

not actively traded that are likely to have an effect on the entity's operating results and financial condition. The Division requested information related to management's judgment in applying the fair value hierarchy, the effect of credit risk on derivative valuations, and the determination fair value measure of financial instruments for which markets were inactive or illiquid.

Table 3 provides an example of each voluntary disclosure item collected from the sample firms' 10-Q's and 10-K's over the sample period. To collect the disclosure items, we search the financial reports for each quarter examining the Management's Discussion & Analysis section and fair value footnote disclosures to identify the occurrence of individual voluntary disclosure items. For each occurrence of an individual item that we identify, we assign a value of one. Our initial measure is the frequency of each disclosure item by firm and firm-quarter.

Table 3: Examples of Actual Voluntary Disclosure Items

| Item No. | Bank Holding Company | Quarter Ending | Disclosure Text |
|---|---|---|---|
| 1 | JP Morgan Chase | 9/30/2008 | The Firm had exposure of $5.2 billion to Alt-A mortgages carried at fair value through earnings at September 30, 2008, which consisted of $1.3 billion of securities, largely rated AAA, and $3.9 billion of first lien mortgages. Net exposure to Alt-A mortgages decreased 38% in the quarter, principally due to asset sales and, to a lesser extent, declines in asset values. |
| 2 | Citigroup | 6/30/2007 | More specifically, for fixed income securities and derivatives, the Company's alternative approach when market prices are not available is to discount the expected cash flows using market interest rates commensurate with the credit quality and duration of the investment. For loans carried at fair value, there is no related allowance for loan losses. |
| 3 | Bank of America | 6/30/2008 | Disclosure relating to loans held for sale:<br>In light of market conditions, we implemented a change in our valuation approach for these loans, basing the valuation on pricing models including discounted cash flow methodologies. Previously, these loans were valued based on quoted prices from market participants. |
| 4 | Citigroup | 12/31/2008 | The valuation as of December 31, 2008, assumes a cumulative decline in U.S. housing prices from peak to trough of 33%. This rate assumes declines of 16% and 13% in 2008 and 2009, respectively, the remainder of the 33% decline having already occurred before the end of 2007. |
| 5 | Wells Fargo | 12/31/2008 | Trading assets and liabilities are typically valued using trader prices that are subject to independent price verification procedures. |
| 6 | Bank of America | 3/31/2009 | Key economic assumptions are used in measuring the fair value of certain residual interests that continue to be held by the Corporation in municipal bond securitizations. The carrying amount of residual interests for municipal bond securitizations was $370 million and the weighted-average discount rate was 4.07 percent at March 31, 2009. A 10 percent and 25 percent adverse change to the discount rate would have caused a decrease of $71 million and $177 million to the residual interests at March 31, 2009. |
| 7 | Citigroup | 3/312009 | In addition, the discount rates were based on a weighted average combination of the implied spreads from single name ABS bond prices, ABX indices and CLO spreads, depending on vintage and asset types. To determine the discount margin, the Company applies the mortgage default model to the bonds underlying the ABX indices and other referenced cash bonds and solves for the discount margin that produces the current market prices of those instruments. |
| 8 | Bank of NY Mellon | 3/31/2009 | Most derivative contracts are valued using internally developed models which are calibrated to observable market data and employ standard market pricing theory for their valuations. An initial "risk-neutral" valuation is performed on each position assuming time-discounting based on an AA credit curve. Then, to arrive at a fair value that incorporates counterparty credit risk, a credit adjustment is made to these results by discounting each trade's expected exposures to the counterparty using the counterparty's credit spreads, as implied by the credit default swap market. We also adjust expected liabilities to the counterparty using the Company's own credit spreads, also implied by the credit default swap market. Accordingly, the valuation of our derivative position is sensitive to the current changes in our own credit spreads as well as those of our counterparties. |
| 9 | Wells Fargo | 9/30/2008 | While MSRs and our asset-backed securities collateralized by auto leases and cash reserves do not have observable market data and therefore are classified as Level 3, significant judgment may be required to determine whether certain other assets measured at fair value are included in Level 2 or Level 3. For example, we closely monitor market conditions involving assets that have become less actively traded, such as MHFS, non-agency mortgage-backed securities and certain other debt securities, including collateralized debt obligations. If fair value measurement is based upon recent observable market activity of such assets or |

| | | | |
|---|---|---|---|
| | | | comparable assets (other than forced or distressed transactions) that occur in sufficient volume, and do not require significant adjustment using unobservable inputs, those assets are classified as Level 2; if not, they are classified as Level 3. Making this assessment requires significant judgment. |
| 10 | MetLife | 9/30/2008 | The credit risk of both the counterparty and the Company are considered in determining the fair value for all over-the-counter derivatives after taking into account the effects of netting agreements and collateral arrangements. Credit risk is monitored and consideration of any potential credit adjustment is on a net exposure by counterparty basis due to the existence of netting agreements and collateral arrangements. The Company values its derivative positions using the standard swap curve which includes a credit risk adjustment. This credit risk adjustment is appropriate for those parties that execute trades at pricing levels consistent with the standard swap curve. As the Company and its significant derivative counterparties consistently execute trades at such pricing levels, additional credit risk adjustments are not required in the valuation process. It should be noted that the Company's ability to consistently execute at such pricing levels is in part due to the netting agreements and collateral arrangements that are in place with all of its significant derivative counterparties. Such agreements serve to effectively mitigate credit risk. |
| 11 | U.S. Bancorp | 3/31/2009 | Derivatives are subject to credit risk associated with counterparties to the derivative contracts. The Company measures that credit risk based on its assessment of the probability of counterparty default and includes that within the fair value of the derivative. The Company manages counterparty credit risk through diversification of its derivative positions among various counterparties, by entering into master netting agreements and by requiring collateral agreements which allow the Company to call for immediate, full collateral coverage when credit-rating thresholds are triggered by counterparties. |
| 12 | Bank of NY Mellon | 12/31/2008 | Upon evaluating the uncertainty in valuing financial instruments subject to liquidity issues, we make an adjustment to their value. The determination of the liquidity adjustment includes the availability of external quotes, the time since the latest available quote and the price volatility of the instrument. |
| 13 | PNC Financial Services | 9/30/2008 | Securities include both the available for sale and trading portfolios. We use prices sourced from pricing services, dealer quotes or recent trades to determine the fair value of securities. Approximately half of our positions are valued using pricing services provided by the Lehman Index and IDC. The Lehman Index is used for the majority of our assets priced using pricing services. Lehman Index prices are set with reference to market activity for highly liquid assets such as agency mortgage-backed securities, and matrix priced for other assets, such as CMBS and asset-backed securities. IDC primarily uses matrix pricing for the instruments we value using this service, such as agency adjustable rate mortgage securities, agency CMOs and municipal bonds. |
| 14 | Sun Trust Banks | 9/30/2008 | Pricing services and broker quotes to assist in estimating the fair value of level 2 or level 3 instruments: The number of quotes we obtained varied based on the number of brokers following a particular security, but generally two to four quotes were obtained. |
| 15 | American Express | 12/31/2008 | The pricing services do not apply any adjustments to the pricing models used, nor does the Company apply any adjustments to prices received from the pricing services. |
| 16 | State Street | 12/31/2007 | In developing their quotations, the independent pricing services seek to utilize observable inputs, including trade and market information. However, because many fixed-income securities do not trade regularly, the pricing services' quotations may also be based on proprietary financial models that incorporate available information, such as benchmarking to similar securities, sector groupings or matrix pricing. |
| 17 | American Express | 6/30/2008 | The Company has three other asset-backed securities included in AEIDC's trading investment portfolio that are classified within Level 3 because observable market prices were limited. The pricing for each of these securities was obtained from non-binding, single broker quotes. |
| 18 | KeyCorp | 3/31/2008 | Key corroborates these inputs periodically through a pricing service, which obtains data about actual transactions in the marketplace for identical or similar assets. |
| 20 | Morgan Stanley | 3/31/2009 | For assets and liabilities that were transferred into Level 3 during the period, gains or (losses) are presented as if the assets or liabilities had been transferred into Level 3 as of the beginning of the period; similarly, for assets and liabilities that were transferred out of Level 3 during the period, gains or (losses) are presented as if the assets or liabilities had been transferred out as of the beginning of the period. |

*This table provides an illustrative example of each individual disclosure item that was hand collected from the 10-Q's and 10-K's of the eighteen largest bank holding companies based upon explicit discussion points that the Division provided in its Dear CFO letters. Disclosure item 19 is not included in this table because it is an indicator yes or no if the entity disaggregates purchases, sales, issuances, and settlements in its Level 3 tabular reconciliation.*

The actual disclosures do not strictly match the Division's discussion points as shown in the item 1 disclosure from JP Morgan Chase, in which the company provided information about the credit ratings of its asset-backed securities, but did not provide its expectation of changes to that credit rating. Bank of NY Mellon provides a fairly detailed disclosure about incorporating credit risk in its valuations as per disclosure item 8. This is also the case in the discussion by Wells Fargo with respect to the significant management judgment applied to determine the classification of financial instruments in the fair value hierarchy per disclosure item 9. Interestingly, State Street's disclosure of item 16 is not definitive in terms of whether the

pricing services' quotations reflect unobservable or observable inputs. This is a key matter given the earlier discussion of the existing literature documenting that Level 3 fair value measures are less value relevant and related to increased information asymmetry.

In Table 4, we present the frequency distribution of each voluntary disclosure item by quarter. Untabulated results reveal that the average number of quarterly disclosures during our sample period is 165.2 disclosures, which is an average of 13.5 disclosures per firm-quarter. Disclosure frequency for the early adopters (JP Morgan Chase, Citigroup, Bank of America, Morgan Stanley, and Goldman Sachs) is an average of 40.3 items per quarter in the first three quarters of the sample period, and the early adopters increase disclosure frequency by 151% (to n=113) from Q3 to Q4 of 2007. The first quarter of 2008 represents the disclosure frequencies of all 18 sample firms. Disclosure frequency increases throughout 2008 (notably 42% from Q2 to Q3 and 46% from Q3 to Q4). Disclosure frequency peaks in Q4 of 2008 (n=384), and levels off in the last quarter of our sample, Q1 of 2009 (n=254). The individual disclosure item with the highest frequency of occurrence during our nine-quarter sample period is item 2, which is a general description of valuation techniques or model used to measure fair value (n= 825). The disclosure frequency of this item steadily increases across quarters. The frequency peaks in Q4 of 2008 (n=186), and then decreases in Q1 of 2009 (n=144). The second most frequently disclosed item is that of item 1, which is the nature and type of assets underlying asset-backed security holdings, including credit ratings (n=149). There are no disclosures of item 1 in the first two quarters, disclosures then occur in Q3, 2007 and the frequency increases until its highest incidence in Q3 of 2008 (n=35).

Table 4: Distribution of Voluntary Disclosure Items by Quarter

| Disclosure Item | Q1, 2007 | Q2, 2007 | Q3, 2007 | Q4, 2007 | Q1, 2008 | Q2, 2008 | Q3, 2008 | Q4, 2008 | Q1, 2009 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 4 | 5 | 20 | 29 | 35 | 25 | 31 |
| 2 | 34 | 33 | 30 | 70 | 98 | 106 | 124 | 186 | 144 |
| 3 | 0 | 0 | 0 | 1 | 2 | 2 | 2 | 6 | 3 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 5 | 1 | 1 | 2 | 7 | 10 | 7 | 11 | 21 | 10 |
| 6 | 0 | 0 | 0 | 1 | 5 | 2 | 5 | 4 | 4 |
| 7 | 0 | 0 | 0 | 2 | 4 | 5 | 3 | 6 | 5 |
| 8 | 0 | 0 | 0 | 0 | 1 | 2 | 6 | 5 | 3 |
| 9 | 1 | 1 | 2 | 1 | 2 | 1 | 7 | 6 | 5 |
| 10 | 1 | 2 | 4 | 6 | 4 | 5 | 15 | 22 | 8 |
| 11 | 0 | 2 | 3 | 8 | 6 | 6 | 10 | 30 | 6 |
| 12 | 0 | 0 | 0 | 4 | 1 | 3 | 1 | 8 | 4 |
| 13 | 0 | 0 | 0 | 3 | 7 | 5 | 14 | 16 | 10 |
| 14 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 6 | 1 |
| 15 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 3 | 1 |
| 16 | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 7 | 3 |
| 17 | 0 | 0 | 0 | 0 | 0 | 1 | 7 | 5 | 4 |
| 18 | 0 | 0 | 0 | 1 | 2 | 2 | 5 | 15 | 5 |
| 19 | 0 | 0 | 0 | 2 | 3 | 3 | 3 | 6 | 3 |
| 20 | 0 | 0 | 0 | 2 | 2 | 4 | 4 | 6 | 4 |
| Total | 37 | 39 | 45 | 113 | 169 | 184 | 262 | 384 | 254 |

*This table provides the frequency of each disclosure item collected from the Management Discussion & Analysis section and fair value footnote within the reported 10-Q's and 10-K's of the 18 bank holding companies during the sample period. A listing of the individual disclosure items requested by the SEC's Division of Corporate Finance in their "Dear CFO" letters is provided in Table 2.*

## METHODOLOGY

We estimate the following OLS regression model to test our hypothesis about the association between SFAS-157 voluntary disclosures and information asymmetries:

$$LNSPREAD = \alpha_0 + \alpha_1 DISCL1 + \alpha_2 DISCL2 + \alpha_3 DISCL3 + \alpha_4 DISCL4 + \alpha_5 DISCL5 + \alpha_6 DISCL6 + \alpha_7 DISCL7 + \alpha_8 DISCL8 + \alpha_9 LNTURN + \alpha_{10} LNMVE + \alpha_{11} LNPR + \alpha_{12} STDRET + \varepsilon \quad (1)$$

where:

LNSPREAD = bid-ask spread, our proxy for information asymmetry, which we define as the natural log of the percentage change in spread measured as the difference between the average bid-ask spread for a 3-day window including the earnings announcement date, and the average bid-ask spread for a 3-day window prior to the earnings announcement date as follows:

$$\left\{\frac{1}{t}\sum_{t-1}^{t+1}\frac{ASKt-BIDt}{(ASKt+BIDt)/2}-\frac{1}{t}\sum_{t-4}^{t-2}\frac{ASKt-BIDt}{(ASKt+BIDt)/2}\right\}*100$$

DISCL1 through DISCL8 are disclosure variables derived from conducting factor analysis on the disclosure items we collected. We employ an unweighted least squares (ULS) approach, in which we hypothesize the number of common factors that would explain the observed correlations between the individual variables based upon the general classifications we assessed. The ULS approach extracted eight common factors in nine iterations that cumulatively explain 74.84% of the variance. In Table 5, we detail individual disclosure items that are included in the eight common factors.

Table 5: Disclosure Variables

| **Discl1** | **Broker Quotes Or Prices From Pricing Services** |
|---|---|
| | Item 14. Number of quotes or prices per instrument.<br>Item 16. Whether quotes or prices are based on observable market information.<br>Item 18. Validation procedures for quotes or prices. |
| DISCL2 | Changes in valuation<br>Item 3. A discussion of changes in valuation techniques, if any.<br>Item 4. Quantitative effect of changes in valuation techniques, if any.<br>Item 11. Explanation of how counterparty credit risk affected the valuation of derivative assets. |
| DISCL3 | Valuation techniques<br>Item 2. General description of valuation techniques or models used (i.e., market, income or cost approach).<br>Item 5. Discuss whether and how often the firm validates (calibrates) the techniques or models used.<br>Item 13. Nature, amount, and level in the fair value hierarchy valued using broker quotes or prices from pricing services. |
| DISCL4 | January 2010 FASB Update 06<br>Item 19. Disaggregation of items (i.e., purchases, sales, issuances, and settlements) in Level 3 tabular reconciliation.<br>Item 20. Policy to determine when transfers between levels are recognized. |
| DISCL5 | Management judgment<br>Item 8. Explanation of how credit risk is incorporated in the valuation of assets or liabilities.<br>Item 9. Significant judgment applied to determine the level within the fair value hierarchy.<br>Item 10. Explanation of how the entity's own credit risk affected derivative liabilities valuation. |
| DISCL6 | Asset-backed securities<br>Item 1. The nature and type of assets underlying any asset-backed security, the years of issuance, information about the credit ratings of the securities, including changes or potential changes to those ratings.<br>Item 17.Whether broker quotes are binding. |
| DISCL7 | Sensitivity<br>Item 6. Sensitivity of fair value estimates to the significant inputs the technique or model used (other than sensitivity analysis required under SFAS-140).<br>Item 15. Any adjustments to brokers' quotes or prices from pricing services. |
| DISCL8 | Market indices and illiquidity<br>Item 7. To the extent material, how relevant market indices (e.g., ABX or CMBX) were used to value material assets/liabilities; describe any material adjustments made during the reporting period to the fair value of assets/liabilities based on market indices and reasons for making those adjustments.<br>Item 12.Explain how the illiquidity was factored into the fair value determination. |

*This table details the composition of the eight common factors. We measure the 8 disclosure variables as the mean frequency of the disclosure items that comprise each common factor. We employ ULS approach, in which we hypothesize the number of common factors that would explain the observed correlations between the individual variables based upon the general classifications we assessed. The ULS approach extracted eight common factors in nine iterations that cumulatively explain 74.84% of the variance.*

We measure the 8 disclosure variables as the mean frequency of the disclosure items that comprise each common factor. We include several control variables based on related studies (e.g., Balakrishnan et al., 2014, Amiram et al. 2012). LNTURN = share turnover which we define as the natural log of the ratio of total number of shares traded during the quarter to total number of shares outstanding at the end of the quarter. STDRET= the volatility of returns which we define as the standard deviation of daily returns accumulated over the quarter. LNMVE = the natural log of the end of quarter market value of equity. LNPR = the natural log of the end of quarter closing price. Model 1 provides a test of an association between voluntary SFAS-157 fair value disclosures for the sample of the largest 18 BHCs starting with the first quarter of 2007 in which only 5 of the 18 companies adopted the standard early (with their first quarter of 2007). The remaining 13 companies in our sample that did not adopt SFAS-157 early do not have reported values for Levels 1, 2, or 3, assets or liabilities. In our next model, we modify our sample to start with the first quarter of 2008 to control for Level 1, 2, and 3 assets/liabilities, thus mitigating potential concerns that our inferences may arise from the values of the assets/liabilities themselves, rather than from the *voluntary disclosure* of them. We therefore estimate the following model:

$$\text{LNSPREAD} = \alpha_0 + \alpha_1 \text{DISCL1} + \alpha_2 \text{DISCL2} + \alpha_3 \text{DISCL3} + \alpha_4 \text{DISCL4} + \alpha_5 \text{DISCL5} + \alpha_6 \text{DISCL6} + \alpha_7 \text{DISCL7} + \alpha_8 \text{DISCL8} + \alpha_9 \text{AL1TA} + \alpha_{10} \text{AL2TA} + \alpha_{11} \text{AL3TA} + \alpha_{12} \text{L12TA} + \alpha_{13} \text{L3TA} + \alpha_{14} \text{LNTURN} + \alpha_{15} \text{LNMVE} + \alpha_{16} \text{LNPR} + \alpha_{17} \text{STDRET} + \varepsilon \quad (2)$$

## RESULTS

Table 6 provides descriptive statistics of the dependent variable (LNSPREAD, our proxy for information asymmetry), the voluntary disclosure variables (DISCL1-DISCL8) and the control variables. The mean (median) value of LNSPREAD is -2.7677 (-2.7989). LNSPREAD is a logarithmic value. More negative log values represent smaller spreads (lower information asymmetry).

Table 6: Descriptive Statistics of Regression Variables

| | Mean | Q1 | Median | Q3 | Stdev |
|---|---|---|---|---|---|
| Dependent Variable | | | | | |
| LNSPREAD | -2.7677 | -3.4728 | -2.7989 | -2.0409 | 0.7867 |
| Explanatory Variables | | | | | |
| DISCL1 | 0.1111 | 0 | 0 | 0 | 0.2972 |
| DISCL2 | 0.1831 | 0 | 0 | 0.3333 | 0.3880 |
| DISCL3 | 1.9547 | 0 | 1.3333 | 2.6667 | 2.2265 |
| DISCL4 | 0.1296 | 0 | 0 | 0 | 0.3228 |
| DISCL5 | 0.2263 | 0 | 0 | 0.3333 | 0.4499 |
| DISCL6 | 0.5124 | 0 | 0 | 0.5000 | 1.0748 |
| DISCL7 | 0.0926 | 0 | 0 | 0 | 0.2686 |
| DISCL8 | 0.1420 | 0 | 0 | 0 | 0.3920 |
| Control Variables | | | | | |
| AL1TA | 0.0669 | 0.0051 | 0.0396 | 0.1281 | 0.0694 |
| AL2TA | 0.3462 | 0.1445 | 0.2564 | 0.4716 | 0.2610 |
| AL3TA | 0.0360 | 0.0149 | 0.0278 | 0.0573 | 0.0262 |
| L12TA | 0.2175 | 0.0082 | 0.0575 | 0.3787 | 0.2800 |
| L3TL | 0.0099 | 0.0001 | 0.0029 | 0.0186 | 0.0126 |
| LNMVE | 10.4446 | 9.8007 | 10.3555 | 11.1654 | 1.0092 |
| LNTURN | 2.6923 | 2.1202 | 2.6578 | 3.1948 | 0.7176 |
| STDRET | 0.0473 | 0.0225 | 0.0348 | 0.0675 | 0.0327 |
| LNPR | 3.5837 | 3.3127 | 3.6342 | 4.0325 | 0.7475 |

*LNSPREAD is the natural log of the percentage change in bid-ask spread measured as an average 3 day window including the earnings announcement date, and an average 3 day window prior to the earnings announcement date. DISCL1 to DISCL8 are voluntary disclosure scores obtained through factor analysis of the individual disclosure items. See Table 5 for a more detailed explanation of the DISCL variables. AL1TA, AL2TA and AL3TA are fair value assets Levels 1, 2, and 3 scaled by total assets respectively. L12TA is the sum of the fair value liabilities Level 1 and Level 2 scaled by total assets. L3TA is the fair value liabilities Level 3 scaled by total assets. LNTURN is the natural log of the average ratio of daily trading volume to shares outstanding over the quarter. LNMVE is the natural log of the market value of equity at the end of the quarter. STDRET is the standard deviation of returns over the quarter. LNPR is the natural log of the daily price at the end of the quarter.*

The mean LNSPREAD measure is considerably smaller than the value of -4.309 noted by Liao et al. (2013) in their sample of 2,856 firm-quarter observations of banks in the SIC codes of 6000 to 6100 during Quarter 1 2008-Quarter 4 2009. This is not surprising in that our sample consists of the largest bank holding companies, likely to have the lowest information asymmetry.

We find that the DISCL3 variable (valuation techniques) is the most common form of disclosure that arises from the factor analysis procedure, with a mean (median) 1.9547 (1.333) items disclosed. The other disclosure variables vary in frequency from 0.0926 to 0.5124 on average. For Levels 1, 2, and 3 asset holdings (as a percentage of total assets), we find that Level 2 assets (AL2TA) are the largest component of total assets, representing a mean (median) 34.6% (25.6%) of total assets. Level 3 assets (AL3TA) represent the smallest proportion; a mean (median) 3.6% (2.8%) of total assets.

In preparation for our main empirical tests, we winsorize all continuous variables at the 1% and 99% levels to limit the influence of outliers. We cluster standard errors by firm and year-quarter. We test for mulicollinearity and find that the sum of Levels 1 and 2 fair values of liabilities (L12TA) is highly correlated with Level 3 fair value of liabilities (L3TA); VIF in the regressions significantly exceeds the threshold of 10. Since our primary interest is whether disclosure mitigates information asymmetry related to relatively opaque level 3 valuations, we re-estimate the regressions omitting L12TA and we report the results accordingly. Table 7 provides the results of Model 1. We find that DISCL3 (valuation techniques and the use of brokers quotes or prices from pricing services) and DISCL6 (asset-backed securities and whether brokers quotes are binding) are positively associated with information asymmetry (at the 1 percent level), while DISCL8 (market indices and illiquidity) is negatively associated with information asymmetry.

Table 7: Model 1 Multivariate Regression Results

| Variable | Estimate | Stderr | t-value |
|---|---|---|---|
| Intercept | -2.6664 | 0.5386 | -4.951*** |
| DISCL1 | -0.0976 | 0.1231 | -0.792 |
| DISCL2 | 0.0559 | 0.1142 | 0.489 |
| DISCL3 | 0.0446 | 0.0164 | 2.717*** |
| DISCL4 | 0.1123 | 0.1461 | 0.768 |
| DISCL5 | -0.0032 | 0.0570 | -0.057 |
| DISCL6 | 0.0759 | 0.0159 | 4.766*** |
| DISCL7 | 0.0105 | 0.0835 | 0.126 |
| DISCL8 | -0.1695 | 0.0601 | -2.823*** |
| LNMVE | -0.1135 | 0.0361 | -3.139*** |
| LNTURN | 0.4079 | 0.0885 | 4.608 |
| STDRET | 7.5399 | 2.0474 | 3.683*** |
| LNPR | -0.1360 | 0.0435 | -3.127*** |
| n | 162 | | |

*This table provides the results of an OLS regression estimate of Model 1. ***, **, and * indicate significance at the 1, 5 and 10 percent levels respectively. All variables are defined as in Table 6.*

With respect to the controls and information asymmetry, size is negative and significant, return volatility (STDRET) is positive and significant and price (LNPR) is negative and significant (all at the 1 percent level). In Table 8, we provide results of Model 2 in which we control for Levels 1, 2, and 3 of assets, and Level 3 of liabilities. We find that when controlling for the classification of financial instruments within the fair value hierarchy, DISCL3 remains positive and significantly associated with information asymmetry, however, DISCL6 is no longer significant. DISCL8 also remains negative and significantly associated with information asymmetry. Consistent with the value relevance studies discussed in the literature review and the relation between fair value levels and information asymmetry (Liao et al., 2013), we find that Level 1 assets (AL1TA) and Level 3 liabilities (L3TL) are associated with lower information asymmetry (significant at the 1 percent level), while Level 3 assets are associated with higher information asymmetry (significant at the 1 percent level). In Table 8 we provide an alternative specification of Model 2 that includes an interaction between each of the voluntary disclosure variables and Level 3 assets (AL3TA).

We mean center the explanatory variables in the model estimate before measuring the interaction terms to address multicollinearity (Aiken and West, 1991). Untabulated measures of variance inflation of each of the explanatory variables are below the threshold of 10. Studies document that Level 3 assets are relatively more opaque, have lower value relevance and are related to greater information asymmetry (Liao et al. 2013). We find that the interaction between DISCL2 and Level 3 assets is positively associated with information asymmetry while that of DISCL6 and Level 3 assets is negatively associated with information asymmetry (at the 5 and 10 percent levels respectively). Disclosures about changes in valuation techniques (DISCL2) intensify the positive association between Level 3 assets and information asymmetry, while disclosures about asset-backed securities (DISCL6) reduce information asymmetry when Level 3 assets are relatively higher (AL3TA).

Table 8: Model 2 Multivariate Regression Results

| | Model 2 | | | Alternative Specification of Model 2 | | |
|---|---|---|---|---|---|---|
| **Variable** | **Estimate** | **Stderr** | **t-value** | **Estimate** | **Stderr** | **t-value** |
| Intercept | -2.4026 | 0.4925 | -4.878*** | -2.2327 | 0.0835 | -26.754 |
| DISCL1 | 0.0137 | 0.0874 | 0.157 | -0.1059 | 0.0635 | -1.669 |
| DISCL2 | -0.0583 | 0.1633 | -0.357 | -0.1379 | 0.1500 | -0.920 |
| DISCL3 | 0.0547 | 0.0184 | 2.970*** | 0.0481 | 0.0229 | 2.102 |
| DISCL4 | 0.0785 | 0.1725 | 0.455 | -0.0439 | 0.2593 | -0.169 |
| DISCL5 | 0.0757 | 0.0567 | 1.335 | 0.3017 | 0.1769 | 1.706 |
| DISCL6 | 0.0186 | 0.0237 | 0.787 | -0.0297 | 0.0129 | -2.298 |
| DISCL7 | -0.1650 | 0.1521 | -1.084 | -0.2588 | 0.2477 | -1.045 |
| DISCL8 | -0.1067 | 0.0372 | -2.870*** | -0.0161 | 0.2498 | -0.065 |
| AL1TA | -3.8367 | 0.6281 | -6.108*** | -4.3239 | 0.7761 | -5.571*** |
| AL2TA | 0.0367 | 0.2077 | 0.177 | 0.0655 | 0.4069 | 0.161 |
| AL3TA | 9.4608 | 3.9814 | 2.376** | 7.3570 | 2.1566 | 3.411*** |
| L3TL | -8.7416 | 1.3454 | -6.498*** | -9.4096 | 4.9871 | -1.887* |
| DISCL1xAL3TA | | | | -6.0544 | 9.1944 | -0.659 |
| DISCL2xAL3TA | | | | 3.8813 | 1.7675 | 2.196** |
| DISCL3xAL3TA | | | | -0.3694 | 0.8568 | -0.431 |
| DISCL4xAL3TA | | | | -5.8845 | 7.2529 | -0.811 |
| DISCL5xAL3TA | | | | -6.9379 | 4.7845 | -1.450 |
| DISCL6xAL3TA | | | | -1.7926 | 1.0617 | -1.689* |
| DISCL7xAL3TA | | | | -8.1633 | 5.0838 | -1.606 |
| DISCL8xAL3TA | | | | -4.9121 | 9.8046 | -0.501 |
| LNMVE | -0.0449 | 0.0861 | -0.522 | 0.0034 | 0.1247 | 0.027 |
| LNTURN | 0.1040 | 0.0751 | 1.386 | 0.1665 | 0.0215 | 7.734*** |
| STDRET | 8.3251 | 2.8948 | 2.876*** | 8.1989 | 2.7472 | 2.985*** |
| LNPR | -0.1541 | 0.0925 | -1.665* | -0.2302 | 0.1643 | -1.401 |
| n | | | | | | 90 |

*This table provides the results of an OLS regression estimate of Model 2. ***, **, and * indicate significance at the 1, 5 and 10 percent levels respectively. All variables are defined as in Table 6.*

## CONCLUSION

We hand collect the voluntary SFAS-157 disclosures of the largest 18 BHCs that we expect the SEC's Division of Corporate Finance targeted in its efforts to improve investor confidence and market liquidity, particularly related to relatively opaque Level 3 asset/liability valuations. We identify the voluntary disclosures to collect using the discussion points described in the Division's "Dear CFO" letters that it sent in 2008 to certain registrants as benchmarks. We collect and tabulate these disclosures and create 8 common factors using factor analysis. These factors relate to (1) broker quotes or prices from pricing services, (2) changes in valuation techniques, (3) valuation techniques, (4 ) additional disclosures about Level 3 components that became mandatory after the sample period, (5) the significant judgment management applied, (6) asset-backed securities, (7) sensitivity analyses, and (8) market indices and illiquidity.

We first estimate our main model to examine whether such voluntary disclosures are associated with changes in information asymmetry using a sample from the first quarter of 2007 through the first quarter of

2009. This allows us to consider the impact of the requested disclosures on information asymmetry using an earlier time period as a benchmark. We find that disclosures about validation techniques and the use of broker or price service quotes are associated with increased information asymmetry. The most frequent disclosure item relates to valuation techniques, making it possible that any potential benefit to lesser informed traders is muted. In addition a detailed examination of disclosures related to the use of broker quotes or prices from pricing services revealed that such quotes or prices were not binding, limiting the potential benefit of prices from independent sources. In contrast, disclosures about the use of market indices and adjustments for illiquidity are associated with decreased information asymmetry. We obtain equivalent results when controlling for the fair value levels within the fair value hierarchy.

Using an alternative specification of our model that includes controls for the fair value levels, we also provide evidence of joint effects of SFAS-157 voluntary disclosures and the extent of Level 3 assets the entity held on information asymmetry. When the model includes interactive effects, disclosures about changes in valuation techniques intensify the positive association between Level 3 assets and information asymmetry, while disclosures about asset-backed securities mitigate the positive association between Level 3 assets and information asymmetry. Taken together, this study provides insight about the types of disclosures that through main effects or interactions can impact information asymmetries in a period of tumultuous volatility and uncertainty. However, it is just this setting and small sample size that may limit the ability to generalize these inferences to other time periods or other financial firms. We also note that even in a time period of tremendous uncertainty, the information asymmetry for this sample of the largest 18 BHCs was considerably lower than that of another study in the same time period. Further study is needed to assess the benefits/costs of the type of disclosures examined herein, particularly as the FASB deliberates on the effectiveness of fair value measurement disclosures.

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# AN EMPIRICAL INVESTIGATION OF AUDIT COMMITTEE EFFECTIVENESS AND RISK MANAGEMENT: EVIDENCE FROM SAUDI ARABIA

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**ABSTRACT**

*This study examines the association between audit committee characteristics and the combination of risk management and audit committee activities by industrial Saudi listed firms. Since none of the sample firms has established a stand-alone risk management committee and the functions of monitoring and controlling risk activities are closer to the audit committee than board of directors, this study expects that audit committees with non-executive independent members, more members on the audit committee, financially expert audit committee members and diligence are more likely to combine the risk management and audit committee activities. The study utilizes a cross-sectional analysis of 102 firm-year observations during the 2007-2011 period. A pooled logistic regression analysis is used to estimate the associations proposed in the hypotheses. The study finds that only audit committee size is positively related to the combination of risk management and audit committee activities. This result suggests that the size of the audit committee do indeed proxy for its effectiveness in enhancing the quality of internal control and, thus, monitoring risk management activities. The result of this study contributes to the existing theory and empirical evidence of how the effectiveness of audit committee is related to monitoring and controlling risk management activities. This study offers policy-makers additional evidence to be used for setting up and/or enacting regulations in Saudi Arabia.*

**JEL**: M40, M42

**KEYWORDS**: Audit Committee Effectiveness, Risk Management, Saudi Arabia

## INTRODUCTION

There has been a notable increase in concern regarding corporate failures and scandals in the previous years. In particular, in the U.S. financial crisis and the unexpected collapse of many corporations and banks have led to the adverse outcome including the reduction of economic activity, loss of public confidence and volatile financial system (Ng, Chong and Ismail, 2012). According to Subramaniam, McManus and Zhang (2008) and Walker, Shenkir and Barton (2002), investors have become more focused on the importance of risk and uncertainty. In fact, excessive risk taking is deemed to be the justification behind internal control. In addition, in a competitive environment that shapes and drives changes in the market increases the dynamic competition among companies and urges the companies to undertake even more risks. For the above reasons among others, it has become critical to develop a continuous risk monitoring and assessment for corporate accountability (Brown *et al*., 2009). Moreover, several governance initiatives have been brought forward with the aim of improving corporate governance with great stress on the role of risk management (Subramaniam, McManus and Zhang, 2008). Risk management has become more significant to the committees of the board and currently, the audit, finance and risk management committees primarily consider risk management on top of their list.

The risk management committee (RMC) is a unit that used to have a small role has not become significant in the company. Risk management activities are integrated to audit committee's responsibilities and functions. In the context of Saudi Arabia, the Code of Corporate Governance (2006) has not emphasized on risk management activities as part of the functions of the audit committee but instead it is included in the main functions of the board of directors. In the Saudi Code, companies have an option to whether or not establish sub-committees as their business nature dictates instead of mandating Saudi Companies to establish RMC. The scope of an audit committee is deemed to cover risk management and internal control in addition to making sure of integrity and transparency in the financial reporting process but this all depends on the corporate governance practices among the companies. Additionally, the audit committee takes part in several risk exercises including risk identification, evaluation, management and control. Despite the above, the trust placed on the audit committee in its protection of the shareholder's investments is besmirched by corporate failures and scandals. Moreover, the recurring business collapses significantly paints an adverse picture of the audit committee's effectiveness in overseeing and executing risk management initiatives (Bates and Leclerc, 2009). Based on Zaman's (2001) study, it is unreasonable to expect an audit committee to conduct extensive review as its members only possess limited resources when it comes to skills and time. But according to Burton (2008), risk is not just a description defined from the perspective of finance it is also related to politics, economy, regulation and market.

In this context, Bugalla *et al*. (2012) and others suggested that an audit committee should be independent from RMC in order to maintain the integrity and protect against fiduciary malfeasance. Given the dynamically complex environment, De Lacy (2005) urged for the establishment of an independent RMC– a contention supported by Brown *et al*. (2009) who stated that an audit committee may not be capable of overseeing the financial as well as the non-financial risks. Added to this, Daly and Bocchino (2006) contended that majority of audit committee members were uncomfortable with the burden of risk oversight. Therefore, researchers are convinced that an independent RMC is capable of reinforcing the internal control mechanism of the firm (Yatim, 2010). In Saudi context, none of the industrial sector firms has established an independent risk management committee. Rather they disclose via their annual reports that the risk management activities are combined with audit committee functions. Therefore, this procedure has been argued by this study to be better situation than the ambiguity in identifying the who's is responsible concerning risk management activities. And, these risk activities would be better monitored by audit committee members than if they have been controlled by board members.

Despite the advocacy and consensus of researches on the RMC benefits and an independent committee for risk oversight, the empirical findings in this regard have remained few and far between. To start with, Brown *et al*. (2009), reviewed risk management in biotechnology companies in Australia and Subramaniam *et al*. (2009) investigated association between RMC establishment and the firm's characteristics and board factors. Also, Yatim (2010) conducted a similar research in the Malaysian context while Bugalla *et al*. (2012) brought forward a model of governance and risk management for financial intermediaries. Apart from the above and a few others, the lack of research was attributed by Tufano (1996) to the lack of meaningful data on risk management practices. The lack of research dedicated to risk management and corporate governance is the motivation in the present study to examine factors that are deemed to result in the combination of risk management and audit committee functions in the context of Saudi industrial firms. This is especially true as the industrial sector is more susceptible to various kinds of risks in the country, region, and global business environments. In particular, this study investigates whether or not the combination of risk management and audit committee functions is related with the characteristics of audit committee. An audit committee having more independence, more members, experts and meetings are more likely to support the board of directors in overseeing the risk management activities and hence displaying its commitment in enhancing overall governance environment in the firm. The present study is an attempted extension to that of Yatim's (2009) study in a manner that it uses a different measurement of the risk management monitoring. Yatim (2009) has measured the extent of risk management monitoring as to the existence of a separate risk management.

Unlike this measurement, this study measures the extent of monitoring risk management as whether these activities are monitored and controlled by the audit committee as all industrial listed companies in Saudi Arabia have not established a stand-alone risk management committee. Therefore, this study contributes to risk management and audit committee literature. It examines the factors related to the combination of risk management and audit committee functions and highlights the audit committee's characteristics in Saudi industrial listed firms. It is carried out in an institutional environment where firms are mandated to establish audit committees and report internal control compliance but no mandates have been imposed regarding the establishment of other board committees like RMC which solely concentrates on risk management. The rest of the paper continues as follows. The next section briefly discusses the literature review and the hypotheses development. The third section describes the research design and methodology. The empirical results and discussions of the study are reported in the fourth section while in the final section, conclusions and implications are drawn.

## LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Based on the viewpoint of risk-based approach, the establishment of RMC indicates to the firm's awareness of the importance of risk management and control (Hermanson, 2003; Selim and McNamee, 1999). The audit committee oversees risk management activities as its primary task and it monitors the financial performance of the firm and to ensure the financial reporting's reliability. The periodic review of the risk management, mitigation system, and managerial actions of the firm employed to manage its risks is significant in the task fulfillment. As the audit committee monitors the risk management activities, the internal control mechanism is supported. Therefore, in the context of effective corporate governance practices, the characteristics that contribute to audit committee effectiveness are likely to be positively related to the risk management committee monitoring (Yatim, 2009).

### Audit Committee Independence

The independence of audit committee has the most compelling theoretical and empirical support and is the most critical attribute that indicates the effectiveness of the audit committee (Klein, 2002; Robinson and Owens-Jackson, 2009). The Saudi Code of Corporate Governance (2006) stipulates that audit committee members should comprise of non-executive independent directors to guarantee superior monitors of management. This contention is supported by the agency perspective, in a sense that independent audit committees offer higher monitoring of managerial discretions with the inclusion of management risk-taking activities. Additionally, independent audit committee members are more likely to consider their service on an audit committee through which reputational capital can be enhanced (Fama and Jensen, 1983a; Gilson, 1990). The reputational capital preservation motivates for higher quality monitoring. It is thus expected that an independent audit committee offers effective monitoring and assists in strengthening internal controls. Hence, consistent with the risk-based approach, an independent audit committee is deemed to effectively monitor risk management activities as it is advantageous to the audit committee; for instance, in going over the firm's risk assessment system. Recent empirical evidence provided by Yatim (2009) is also consistent with the relationship of the audit committee independence and RMC establishment. The preceding argument leads to the first hypothesis which tests the assertion that a more independent audit committee is likely to monitor risk management activities.

*$H_1$: Ceteris paribus, there is a positive association between the proportion of non-executive directors on the audit committee and the monitoring of risk management activities.*

### Audit Committee Size

According to Kalbers and Fogarty (1993), the audit committee size is a proxy for its effectiveness. In this context, Pincus *et al*. (1989) contended that audit committee is an expensive monitoring mechanism and as

such, a large committee reflects the ample resources invested on this mechanism. The Saudi Code of Corporate Governance (2006) stipulates that audit committees of listed firms should consist of at least three members. This mandate is likely to be driven by an attempt to encourage firms to invest director resources to audit committees. The size of audit committee recommendation also matches the desire to maximize the organizational status of the committee (Braiotta, 2000). Recent empirical evidence (Yatim, 2009) reinforced the relationship between the size of audit committee and RMC establishment. Thus, it is expected that large sized audit committees are likely to effectively monitor risk management activities as this will improve their responsibility of oversight. The following hypothesis is therefore proposed:

*$H_2$: Ceteris paribus, there is a positive association between audit committee size and the monitoring of risk management activities.*

Audit Committee Financial Expertise

With regards to audit committee financial expertise, it has been considered by researchers (Carcello and Neal, 2003; and Lee *et al*., 2004) as a proxy for the effectiveness of audit committee. According to Fama and Jensen (1983), audit committee members have invested a significant level of effort to develop their financial experience and as a result, they have a significant motivation to practice their monitoring role to maintain their reputation in the market. The Saudi Code of Corporate Governance (2006) mandates that at least one specialist in accounting and finance be a member of the audit committee. The members of the audit committee with this type of expertise and knowledge enables an in-depth understanding of issues and risks of auditing and the audit procedures to determine and tackle issues and risks (DeZoort and Salterio, 2001). Audit committee members with financial backgrounds are experienced and trained to comprehend and explain risk management activities and hence firms with at least one financially savvy director in the audit committees may urge for a more active engagement in risk management process. In light of the above argument, the following hypothesis is proposed:

*$H_3$: Ceteris paribus, there is a positive association between audit committee members with accounting and finance qualifications and the monitoring of risk management activities.*

Audit Committee Meetings

An audit committee that is active in terms of their meetings is more likely to impact management or board decisions (Abbott *et al*., 2004; Arel *et al*., 2006; Beasley *et al*., 1999; DeZoort *et al*., 2002; Hughes, 1999; Kalbers and Fogarty, 1993; Park, 1998; Robinson & Owens-Jackson, 2009). Several studies and governance practice guidelines also push for the diligence of the audit committees in doing their duties (Beasley, Carcello, and Hermanson, 1999; Horton *et al*., 2000; Blue Ribbon Committee, 1999). Studies dedicated to audit committees consider the frequency of audit committee meetings in year as a proxy for the effectiveness of the committee. Previous literature also stated that an audit committee that holds frequent meetings may minimize the incident of financial reporting issues. Frequent meetings of the committee with external auditors and management, would enable the audit committee to keep abreast of the accounting and risk management issues, and is likely to tackle difficult issues regarding accounting and auditing in an effective manner (Raghunandan, Rama, and Scarbrough, 1998). Several studies and governance practice guidelines also urge for the diligence of audit committees in carrying out their duties (e.g. Beasley, Carcello, and Hermanson, 1999; Horton *et al*., 2000; Blue Ribbon Committee, 1999). These frequent meetings as mentioned earlier, may lead to the addressing of challenging issues of accounting and auditing (Raghunandan, Rama, and Scarbrough, 1998). Yatim's (2009) empirical evidence supports the relationship of the audit committee meetings with the establishment of RMC. Accordingly, it is expected that more diligent audit committees are likely to monitor risk management activities. The above argument results in the following hypothesis:

*$H_3$: Ceteris paribus, there is a positive association between audit committee meetings and*

*and the monitoring of risk management activities*

## RESEARCH DESIGN AND METHODOLOGY

### Sample and Data

To test the hypothesized variables, we hand-collected audit committee data from the annual reports of the industrial listed companies in Saudi Stock Exchange (*Tadawul*) for the period of 2007-2011. The selection of the period from 2007 to 2011 ensures the availability of recent and complete data. In addition, the Code of Corporate Governance in Saudi was introduced in 2006. Further, the late of 2005 and beginning of 2007 represent economic solidity and boom as well as political stability. Samples selected for the five years are depicted in Table 1. For the other control variables, data are retrieved from annual reports and DATASTREAM. The audited annual financial statements reports published by each industrial company are downloaded from the companies' websites, in addition to the hand-collected annual reports from the Saudi stock Exchange.

Table 1: Sample Selection Procedure

| Sample Attributes | Number of Observations |
|---|---|
| Total industrial firms in Saudi Arabia, from 2007 to 2011 | 118 |
| Observations discarded | (6) |
| Final sample | 102 |

### Model Specification

The economic model is used to develop a model of a RMC establishment. The variables proposed for inclusion in the model captures differences in the costs of agency relationships. Since the dependent variable is a dichotomous, non-metric scale measurement; a combination of RM & AC functions or otherwise, to estimate this model, Multivariate Analysis is applied using pooled cross-sectional logistic regression analysis. The functional equation of logistic regression model is utilized to determine the extent of the association of each of the independent variables on the RM_&_AC.

$$RM\_\&\_AC = \beta 0 + \beta 1\ AC\_IND + \beta 2\ AC\_SIZE + \beta 3\ AC\_EXPERT + \beta 4\ AC\_MEET + \beta 5\ LASSET + \beta 6\ LEV + \beta 7\ FAGE + e \quad (1)$$

Where:

| | | |
|---|---|---|
| RM_&_AC | = | the estimated conditional probability of the combination of RM & AC responsibilities is a function of audit committee characteristics and firm-related variables, |
| AC_IND | = | the proportion of non-executive directors on audit committee, |
| AC_SIZE | = | the number of directors served on audit committee, |
| AC_EXPERT | = | the proportion of audit committee members with finance and accounting qualifications, |
| AC_MEET | = | the number of meetings held by audit committees during the financial year, |
| LASSET | = | $\log_{10}$ of the total assets, |
| LEV | = | total debt to total assets, |
| FAGE | = | the number of years since the company is established, |
| e | = | error term. |

Since logistic regression is used to test the hypotheses, outliers are detected and handled, assumptions of multicollinearity and model specification tests such as Linktest and Box-Tidwell are met. We also control for the effect of three agency-related variables found by related literature for their potential confounding

effect on the likelihood of combining the functions of RM & AC. It is expected that the combination of RM & AC functions to be positively associated with firm size *LASSET*, firm leverage *LEV*, and the firm age *FAGE*. Firm size *LASSET* was identified by Wallace and Kreutsfeldt (1991) as among the firm characteristics that may impact the decision of the firm to establish internal control mechanism. Top management has the potential to lose direct control of the operation and risk-taking investments in large firms. This is supported by Yatim and Subramaniam *et al*. (2008) who highlighted a positive relationship between firm size and RMC establishment. The effect of leverage *LEV* is also controlled in the analysis as the risks associated with a high level of leverage may require firms to evaluate risks on a firm-wide basis. Firms with a high level of leverage are likely to demonstrate their commitment to the existing debt holders and to their future creditors that they have a better disclosure of their firms' risk exposures (Goodwin and Kent, 2006; Liebenberg and Hoyt, 2003). Thus, the ratio of total debts to total assets is used to control for the effect of leverage. As for firm age *FAGE*, Geroski (1995) indicates that firm age is a proxy of the firm's business experience. Therefore, firm age is associated with positive firm's growth in terms of monitoring and control. Audit committee members in old-aged companies enhance the quality of financial reporting by identifying and mitigating management risk activities which, in turn, contributes to the combination of RM & AC functions.

## EMPIRICAL RESULTS AND DISCUSSIONS

Table 2 depicts the mean, standard deviation, minimum and maximum of each variable in the sample data set.

Table 2: Descriptive Statistics ($N$ = 102)

| **Panel A: Continuous Variables** | | | | |
|---|---|---|---|---|
| Variables | Mean | Std.Deviation | Minimum | Maximum |
| AC_INDE | 0.34 | 0.321 | 0 | 1 |
| AC_SIZE | 3.11 | 0.855 | 0 | 5 |
| AC_EXPERT | 0.09 | 0.156 | 0 | 1 |
| AC_MEET | 3.32 | 1.764 | 0 | 7 |
| Control variables | | | | |
| FSIZE | 24445681 | 63369846 | 1025345 | 332783648 |
| LEV | 32.09 | 20.948 | 0 | 69 |
| FAGE | 22.31 | 16.688 | 1 | 57 |
| **Panel B: Dichotomous Variables** | | | | |
| Variable | | A combined function (%) | | Not combined (%) |
| A combination function of AC & RM | | 36 (35) | | 66 (65) |

*This table shows the descriptive statistics of the variables*

Panel A of Table 2 shows that there is a significant range of variation among the considered sample of this study. It shows that the range of *AC_INDE* is from 1 to 0 with an average of 0.34 and a standard deviation of 0.321. The average number of *AC_SIZE* is 3.11 and it ranges from 5 to 0 with a standard deviation of 0.855. *AC_EXPERT* of firms in the sample ranges from 1 to 0 with a mean of 0.09 and a standard deviation of 0.156. The maximum number of *AC_MEET* is 7 and the minimum is 0 with a mean of 3.32 and a standard deviation of 1.764. The mean of *FSIZE* is S.R 24445681 with a maximum of S.R 332783648 and a minimum of S.R 1025345 and a standard deviation of 63369846. The *LEV* ranges from 69 to 0 with an average of 32.09 and a standard deviation of 20.948. The mean of *FAGE* is 22.31 with a range between 57 to 1 and a standard deviation of 16.688. In addition, Panel B of Table 4.1 illustrates that 66 firms (about 65 percent) in the sample combine the risk management function with the audit committee function.

Table 3: Correlation Matrix for Variables Used in the Study ($N$ = 102 Firms)

| | AC_INDE | AC_SIZE | AC_EXPERT | AC_MEET | FSIZE | LEV | FAGE |
|---|---|---|---|---|---|---|---|
| AC_INDE | 1 | | | | | | |
| AC_SIZE | 0.186 | 1 | | | | | |
| AC_EXPERT | -0.039 | -0.087 | 1 | | | | |
| AC_MEET | 0.462** | 0.033 | 0.270** | 1 | | | |
| FSIZE | -0.083 | -0.384** | 0.309** | 0.238* | 1 | | |
| LEV | 0.109 | -0.038 | 0.149 | 0.009 | 0.551** | 1 | |
| FAGE | -0.014 | 0.136 | -0.158 | 0.038 | -0.156 | -0.489** | 1 |

*** Correlation is significant at the 0.01 level (2-tailed); *Correlation is significant at the 0.05 level (2-tailed)*

Table 3 illustrates the correlation among variables. The correlation matrix confirms that no multicollinearity exists between the variables as none of the variables correlates above 0.80 or 0.90. All variables have a correlation of less than 0.551 (Myers, 1990). It is worth mentioning that the correlation matrix has been considered as a limited analysis because it ignores the interrelationships among the variables. Table 4.3 shows the pooled logistic regression used to evaluate the level of association of the hypothesized variables on the propensity of combining the functions of risk management and audit committee. The $p$-value associated the chi-square with 7 degrees of freedom is statistically significant at 5% level ($p$ = 0.034), indicating a moderately good model fit. The $R^2_{LOGIT}$ value for this study is 11.45, implying a reasonably explanatory model. Further, Hosmer and Lemeshow goodness-of-fit statistic is non-significant ($X^2$ = 5.290, df =8, $p$ > 0.05), suggesting that the overall model fit is acceptable. Moreover, the model yielded a Nagelkerke $R^2$ of 19 per cent indicating that the independent variables contribute to the combination of risk management with audit committee functions.

Table 4 displays that two test variables of the audit committee characteristics out of four were consistently significantly associated with the incidence of combining the risk management and audit committee functions. As for audit committee size, *AC_SIZE* is positively associated with the combination of RM & AC functions ($p$-value = 0.098, one-tailed significance). This result is consistent with the prediction of agency theory and, empirically, with the finding of Yatim (2009). This result gives support to hypothesis 2 in a manner that the size of the audit committee do indeed proxy for its effectiveness in enhancing the quality of internal control and, thus, monitoring risk management activities. Since the Saudi listed industrial companies have not established a separate risk management committee, therefore, audit committee size contributes in conducting a periodic review of the firm's risk management activities. As for audit committee meetings *AC_MEET,* a significantly negative association has been reported between audit committee meetings and the combination of RM & AC functions ($p$-value = 0.051, one-tailed significance). This result does not give support to the agency theory suggestion and to the empirical finding reported by Yatim (2009) that meeting frequency is not an important component of audit committee effectiveness. Thus, hypothesis 4 is not supported.

Table 4: the Results of the Pooled Logit Regression (*N* = 102 Firms)

| Variables | Expected Sign | Coefficient | Z | P-Value |
|---|---|---|---|---|
| AC_INDE | + | -0.4116 | -0.47 | 0.638 |
| AC_SIZE | + | 0.4133 | 1.29 | **0.196** |
| AC_EXPERT | + | 1.3352 | 0.85 | 0.396 |
| AC_MEET | + | -0.2776 | -1.63 | **0.102** |
| | | | | |
| Control variables | | | | |
| FSIZE | + | 1.0098 | 1.69 | **0.091** |
| LEV | + | -0.0379 | -2.12 | **0.034** |
| FAGE | + | -0.0543 | -2.58 | **0.010** |
| Constant | + | -5.5662 | -1.52 | 0.127 |
| -2 Log Likelihood | -58.6409 | | | |
| Hosmer-Lemeshow | 0.728 | | | |
| $Chi^2$ (7) | 15.16 | | | |
| Prob > $chi^2$ | 0.034 | | | |
| Pseudo $R^2$ | 0.1145 | | | |
| Nagelkerke $R^2$ | 0.190 | | | |
| Coxsnell $R^2$ | 0.138 | | | |
| Correctly Classified (%) | 72.5 | | | |
| No. of Observations | 102 | | | |

**** significant at 1%, **significant at 5% and *significant at 10% (1-tailed test where direction is predicted, otherwise 2-tail.)*

The results also show that there is no support for hypothesis 1 and 3 concerning the associations of audit committee independence *AC_INDE* and audit committee financial expertise *AC_EXPERT* with combining the functions of RM & AC. These results are not in the line with the prediction of agency theory and the previous finding reported by Yatim (2009) concerning the audit committee independence. As for the audit committee financial expertise, Yatim (2009) reported an insignificant association between the establishment of RMC and audit committee financial expertise. Yatim (2009) indicate that audit committee qualification are more useful in auditing and financial reporting matters and, therefore, these qualifications are not needed in identifying and mitigating risks associated with firm operations and businesses.

## CONCLUSIONS AND IMPLICATIONS

The main objective of this study is to examine the association between combining the risk management and audit committee functions with audit committee characteristics of Saudi listed industrial firms. The hypotheses of this study is based on the premise that industrial firms that have more independent, large size, financial expert and diligent audit committees are more likely to combine the functions of risk management and audit committee since these firms have not established a stand-alone risk management committees. The study reports that the combining of risk management and audit committee functions is positively associated only with audit committee size. Thus, the size of the audit committees among industrial Saudi firms is likely to support and enhance the quality of internal control and, thus, monitoring risk management activities. Limitations of the study lie on the other internal corporate governance mechanisms (i.e., board of directors characteristics and ownership structure). Future line of research should put an effort to introduce these mechanisms. Further research should replicate this model to determine its validity in different contexts of GCC countries, in different time periods, and with different sample size. These limitations may motivate more future research in the GCC market.

One important implication of these findings relates to the issue of firm performance in of Saudi Arabia. Saudi government, stock market, companies and accounting and auditing regulators would gain some new insights from this study in terms of the understanding the determinants influencing risk management activities. The results of this study would benefit banks in the way that they can assess the creditworthiness of incorporating companies in Kingdom of Saudi Arabia. The numbers incurred in the audited financial statements are based on to mandate bond covenants. Moreover, credit decisions made by lenders are determined based on audited financial statements. Therefore, risk management issues are of the utmost

important for any lending institution. Investors and financial analysts depend on audited financial statements to make decisions related to bonds, bond rating, interest rate, and all other decisions related to investments in Kingdom of Saudi Arabia market. Accordingly, increased understanding and prediction of companies' events is important to this user group. Further, the results of this study will be of interest to the researchers and academic community due to a lack of formal research body addressing the issues of risk management in Kingdom of Saudi Arabia and, therefore, this study will provide with substantial information about issues in the markets of Saudi Arabia to count on, in the future, as premise data.

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# DIRECTORS' AND OFFICERS' INSURANCE AND OPPORTUNISM IN ACCOUNTING CHOICE

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**ABSTRACT**

*In this paper, the focus is on how excessive directors' and officers' liability insurance coverage is associated with risk-taking behavior in financial reporting. This study examines the implications of two alternative hypotheses. The opportunism hypothesis predicts that the covered executive is overly buffered from recourse via securities litigation, which leads to aggressive accounting choices. The alternative hypothesis is the economic insurance hypothesis which predicts that firms will over-invest in directors' and officers' liability insurance coverage independent of their aptitude for accounting manipulation because of the managers' risk aversion. Aggressive accounting is measured using regulatory accounting enforcement actions and earnings restatements. I find evidence consistent with the opportunism hypothesis in both the enforcement action and restatement setting, suggesting that officers rely on excessive insurance in making financial reporting decisions. The findings have implications for managerial private information and its impact on financial reporting decisions.*

**JEL**: M41, K3

**KEYWORDS**: Earnings Quality, Litigation, Insurance

## INTRODUCTION

Directors' and officers' (D&O) liability insurance "is designed to protect executives, outside directors, as well as the companies they serve against liability arising from actions taken in the course of doing business" (Trautman and Altenbaumer-Price, 2012). The purpose of this study is to test whether protection from excessive D&O coverage helps explain aggressive accounting choices (tested using regulatory enforcement releases and earnings restatements). This study examines whether D&O insurance coverage (managerial private information in the United States) reflects opportunism and impacts risk-taking behavior in financial reporting. Officers and directors require the firm to purchase group D&O insurance on their behalf to minimize personal liability in the event of a lawsuit, and is purchased to approximate the firm-specific litigation risk. I predict that D&O coverage in excess of the expected coverage provides incentives for managers to engage in opportunistic behavior, measured via financial reporting. Opportunism in the D&O setting is predicted to occur when a manager is overly buffered from securities litigation when coverage is unusually high (above that expected given the firm's litigation risk) and increases the proclivity towards risk-taking behavior in financial reporting.

The alternative prediction to opportunism follows the economic theory on the demand for insurance, which states that investment in insurance is derived from the risk aversion of the covered individual. For investments like insurance, the firm chooses "certainty in preference to uncertainty" (Friedman and Savage, 1948) and is willing to sacrifice a small payment in the form of an insurance premium to secure certainty. Moreover, insurers serve as monitors, thereby protecting their coverage via a corporate governance role in the firm (O'Sullivan, 1997). In sum, the demand for insurance hypothesis predicts that firms will over-invest in insurance despite the low amount of risk-taking in accounting choice, i.e. low probability of aggressive financial reporting. D&O insurance covers managers, directors, and in some cases entire firms. A recent development in D&O insurance coverage is firm coverage. Firms can purchase coverage to

include the firm, along with its executives. It is intended to reduce the agency conflict and deter overly risk averse managerial decision–making by protecting managers against litigation. D&O coverage limits are not disclosed in the United States, whereas the coverage limit is mandatory disclosure internationally. Therefore, D&O is private information which can impact decision-making. According to the Tillinghast–Towers Perrin *Directors and Officers Liability Survey*, D&O coverage is virtually universal among survey participants, at 97%. Firms purchase an average of $20.1 million in D&O coverage, which typically covers their directors and officers against liability arising from the course of their employment, such as employment discrimination and class action securities litigation.

Rather than employ a discretionary accruals measure or earnings quality estimation model, regulatory enforcement actions and accounting restatements are used to detect aggressive financial reporting. Although enforcement actions issued by the Securities and Exchange Commission and Department of Justice typically result from a serious accounting irregularity, the earnings restatements are not always the result of an accounting irregularity. Restatements may not necessarily come from active earnings management, but they are cases where the financial statement information is incorrect. A bias against finding results exists to the extent that not all earnings management activities are detected ex post.

The model of regulatory enforcement actions and earnings restatements uses an ex ante variable (the unexpected level of D&O coverage); therefore, it is truly a predictive model of enforcement actions and restatements. The first step in my methodology is to model the expected D&O coverage limit given the level of firm litigation risk. The findings indicate that the key predictor of coverage limits are total assets and market value of equity, market to book ratio, leverage, capital intensity, dividend payout ratio, and stock return volatility and skewness. The enforcement action prediction model is supplemented with financial statement variables from Dechow, Ge, Larson, and Sloan (2011) with the unexpected D&O coverage limit. The findings show that the dominant effect in enforcement action likelihood is consistent with the opportunism hypothesis: high unexpected D&O coverage is predictive of a higher probability of enforcement action ex ante.

With respect to the accounting restatement model, there is no clear cut set of determinants identified in extant literature (Agrawal and Chadha, 2005, Burns and Kedia, 2006, Efendi, Srivastava, and Swanson, 2007; Richardson, Tuna, and Wu 2002). The same financial statement variables from the Dechow et al. (2011) model are used to predict the likelihood of an accounting restatement given that the coefficient of interest is on the unexpected D&O insurance variable. The findings show that higher than expected levels of coverage are positively associated with the likelihood of an earnings restatement, suggesting that high levels of D&O insurance buffer against litigation recourse, and have adverse financial reporting consequences. The study proceeds as follows. Section 2 reviews prior research and empirical predictions. Section 3 details the sample and descriptives. Section 4 provides evidence on the relation between unexpected D&O coverage and the probability of an enforcement action and restatement. Section 5 concludes.

## PRIOR RESEARCH AND EMPIRICAL PREDICTIONS

### Institutional Background on D&O Insurance and Hypothesis Development

D&O insurance serves several purposes for the firm, its shareholders, managers, directors, and the agency conflict. Prior literature has found that D&O insurance: (1) reduces the agency conflict between shareholders and managers by adding convexity to a risk averse manager's utility function (Bhagat, Brickley, and Coles, 1987) and (2) represents a substitute monitoring device for other governance mechanisms that are costly for the firm (Holderness, 1990, O'Sullivan, 1997). As a recruitment tool, a covered officer is part of the D&O purchase decision because he is exposed to financial and reputational

loss. The board of directors also approves the purchase decision because an "excessive" amount of insurance detracts from the benefits of insurance (O'Sullivan, 1997).

Securities litigation reduces agency costs, because it is an ex post monitoring device available to investors; "the deterrence goals of corporate and securities law liability rules are achieved indirectly, through an insurance intermediary, if indeed they are achieved at all" (Baker and Griffith, 2007). D&O insurance potentially counteracts the benefits of the litigation threat, and thus inhibits the reduction of agency costs. It buffers the executive from being responsible for his actions, and effectively reduces the ex post settling up role of litigation. Even though insurance introduces convexity into the manager's utility function, an excessive amount of insurance may give the manager an incentive for opportunistic behavior. Insurance permits the manager to take more risks and liberties with financial reporting at little personal cost. Aside from reputational loss, class action securities litigation rarely results in defendant monetary liability, because settlement amounts are funded by D&O insurance coverage (Kim, 2005). This supports the idea that insurance buffers the executive from investor recourse and responsibility from value-destroying actions. The purpose of this study is to test whether excessive D&O coverage helps explain aggressive accounting choices, which are identified using regulatory enforcement releases and earnings restatements. This opportunism hypothesis occurs when a manager is overly buffered from investor litigation recourse when D&O coverage is unusually high, i.e. when it considerably exceeds the firm's litigation risk.

An alternate to the opportunism hypothesis follows the economic theory on the purchase of corporate insurance. The purchase of insurance is a negative net present value project, and is purchased because of the risk aversion of the executive. Risk aversion is the common explanation for the individual consumer's demand for insurance; however, the explanation is not so simple for corporations, since their risk is diversifiable. (Dionne and Harrington, 1992, 190). An insurance firm has a "comparative advantage in risk bearing," because the purchase of insurance allows for an efficient allocation of risk for the firms' other claimholders (Dionne and Harrington, 1992). Moreover, D&O coverage is unobservable to investors in the United States; the amount of coverage is private information to the executive which may impact financial reporting decision-making. "Insiders' use of corporate information for private benefit" is referred to as managerial opportunism (Chalmers, Dann and Harford, 2002). In many countries, the amount of D&O coverage purchased is mandatory disclosure. However, since the insurance purchase is not disclosed in the United States, "the insurance decision has few disclosure requirements and is not the subject of civil and criminal laws, and is therefore potentially more revealing of managers' private information" (Chalmers et al., 2002). Therefore, the opportunism hypothesis predicts that an unusually high level of D&O coverage (unexpected, or excessive D&O coverage limit) leads to riskier accounting choices since it lowers the cost to the manager of these choices.

Opportunism with respect to financial reporting quality and D&O insurance have also been examined in two prior studies, which both use Canadian data where the decision to purchase D&O insurance is quite different given that it is mandatory disclosure. Chung and Wynn (2008) find that the threat of litigation, as measured by D&O insurance levels, has been linked to the level of accounting conservatism: "with other conditions held constant, managers would strategically determine the optimal level of conservatism, balancing the effect of their actions on the expected cost of a lawsuit and the expected benefits from less conservative (or more aggressive) reporting of earnings." However, if a managers' expected legal liability is reduced via D&O insurance and indemnification, the strategic choice would be to relax conservative reporting practices (Chung and Wynn, p. 138). Boubarkri, Ghalleb, and Boyer (2008) also find evidence of opportunism in financial reporting related to D&O insurance by examining the level of discretionary accruals and D&O purchases around seasoned equity offerings. Their results indicate that managers invest in D&O insurance in anticipation of the heightened discretionary accrual levels around equity offerings, and that insurers can distinguish between firms who purchase coverage for earnings management activities to those who purchase coverage due to the extreme risk aversion of the covered executives. My study is different from these two studies in that (a) the purchase of U.S. D&O insurance is private information in

the United States, (b) given that D&O coverage limits are slow to move from year to year as they often are multi-year policies, my study is based on a level rather than a changes research design, and (c) I examine errors and irregularities in accounting using regulatory enforcement actions and earnings restatements rather than an estimated model of conservatism or discretionary accruals.

The Use of Enforcement Releases and Earnings Restatements

Rather than employ a discretionary accruals measure or earnings quality estimation model, regulatory enforcement actions and earnings restatements are used to detect aggressive financial reporting. The SEC and DOJ have limited resources to investigate accounting manipulations, so the enforcement action sample is "likely to have a lower Type I error rate in the identification of misstatements than samples that infer misstatement from earnings-based measures such as abnormal accruals" (Dechow, Ge, and Schrand, 2010). There are likely to be many manipulating firms that go undetected by the SEC and DOJ; these observations are included in the non-manipulating firm-year sample, which adds noise to the accounting irregularity test sample. Firms want to avoid regulatory investigation because of the negative consequences identified in extant literature. For example, Leng, Feroz, Cao and Davalos (2011) find that AAER firms suffer from pre- and post- negative long-term returns. Another negative consequence is the termination of the executives involved in the enforcement release. Karpoff, Lee, and Martin (2008) find that 93% of responsible parties lose their jobs by the end of the regulatory enforcement period and most are explicitly fired. The probability of firing increases with the "cost of misconduct to shareholders and the quality of the firm's governance" (Karpoff et al., 2008).

Restatements are also employed as the result of aggressive accounting choices. Earnings restatements are not necessarily the result of an accounting irregularity and therefore active earnings management, but they are cases where the earnings information is incorrect and suggestive of earnings management. A bias against finding results exists to the extent that not all earnings management activities are detected ex post. Restatements may result from: (i) accounting irregularities, including aggressive accounting practices, (ii) intentional and (iii) unintentional misuses of facts applied to financial statements, (iv) oversight or misrepresentation of accounting rules, or (v) fraud (GAO, 2003). Errors or irregularities resulting in restatements are generally reflective of internal control weaknesses (Plumlee and Yohn, 2010). Richardson et al. (2002) find that restatement firms manage earnings to attract external financing at a lower cost, and also to maintain consecutive periods of positive earnings growth and earnings surprises. Because earnings restatements often represent extreme accounting outcomes, using restatements to capture aggressive accounting increases the power of my tests to detect the existence of a D&O effect. Dechow et al. (2010) state that "as with the AAER sample, a significant benefit of using the restatement sample to identify firms with earnings quality problems is a lower Type I error rate in the identification of misstatements" (p. 374). As additional confirmation that restatements are bad accounting outcomes, many D&O underwriters have recently introduced a restatement clause in policies, which permits contract rescission by the insurer if the firm restates its earnings, regardless of the reason for restatement. Therefore, even if some restatements are a result of unintentional motives, from a D&O perspective, they are all negative.

## METHODOLOGY

Directors' and Officers' Insurance Data

D&O data is gathered from Tillinghast-Towers Perrin as part of their annual D&O survey collection. Partnerships, international firms, nonprofits, and government organizations are excluded from the D&O sample. The original D&O sample size is 8,721 spanning from 1997 to 2002.

Enforcement Action Sample

The enforcement action data is the sample used in Karpoff et al. (2008). Their sample is 865 enforcement actions spanning from 1978 to 2007. The sample represents all regulatory enforcement actions issued by the Securities and Exchange Commission and Department of Justice that include at least one violation of either Section 13(b)(2)(A), 13(b)(2)(B), 13(b)(5) of the 1934 Securities Exchange Act or Rules 240.13b2-1 and 13b2-2 of the Code of Federal Regulations. These laws were enacted under the 1977 Foreign Corrupt Practices Act and are commonly known as the "books and records" and "internal controls" provisions of the FCPA and Securitas Exchange Acts. Table 1, Panel A shows the progression of useable observations from the original enforcement action data after merging with *Compustat*, *Crsp*, and D&O data. This yields 35 enforcement action firms, and 1,494 non manipulation firm-years. A non enforcement action, or non-manipulating firm-year can include (i) a firm who has been subject to an enforcement action, but is not a violation year, or (ii) a firm who has not been subject to an enforcement action.

Table 1: Sample Selection

| | | |
|---|---|---|
| **Panel A: Enforcement Action Tests** | | |
| Original number of unique enforcement actions spanning from 1978 to 2007 | | 865 enforcement actions |
| Less: observations missing company identifier | 123 observations | |
| Less: observations missing *Compustat* data | 259 observations | |
| Less: observations missing *Crsp* data | 242 observations | |
| Less: observations missing D&O data | 206 observations | |
| Enforcement action occurrences with D&O data | | 35 observations |
| Non enforcement action firm years with D&O data | | 1,494 firm years |
| **Panel B: Restatement Tests** | | |
| Original number of unique restatements spanning from 1997 to 2002 | | 919 restatements |
| Less: observations missing company identifier | 49 restatements | |
| Less: observations missing *Compustat* data | 223 restatements | |
| Less: observations missing *Crsp* data | 34 restatements | |
| Less: observations missing D&O data | 551 restatements | |
| Number of restatements | | 62 restatements |
| Restatement firm years with D&O data | | 101 firm years |
| Non restatement firm years with D&O data | | 1,794 firm years |

*This table shows the sample formation process. Panel A reports sample formation: the progression from SEC and DOJ enforcement releases provided by Karpoff, Lee, and Martin (2008) from 1978 to 2007 to the ultimate sample used for regression analysis in Table 4. The sample consists of firm-years including a violation year as alleged in the enforcement release. Panel B reports sample formation of the restatement sample: the progression from the GAO database of restatements from 1997 to 2002 to the sample used for regression analysis in Table 6. The sample consists of firm-years that were amended as part of the restatement.*

Table 2, Panel A provides descriptive statistics for the manipulation firm-years and non manipulation firm-years. Violation start and end dates contain manipulation firm-years. The violation start and end dates are independent of the regulatory enforcement release date. Descriptive statistics and variables used in the logit regressions are based on the manipulation firm-years rather than the regulatory release dates. Manipulation firm-years carry higher D&O coverage limits than non-manipulation firm-years (mean of $66 million and $38 million, respectively). Enforcement action firm-years are also larger in assets and market value of equity, which is consistent with the SEC and DOJ using limited resources to target larger firms. Non manipulation firm-years are more highly levered than manipulation firms, and are less likely to experience an issuance.

Accounting Restatement Sample

For a list of restatement firms, the General Accounting Office's 2002 study on Financial Statement Restatements is used. I then search Lexis–Nexis for periods restated, and include all restatements with

available company identifiers, D&O data, and data from *Compustat* and *Crsp*. Table 1, Panel B summarizes the progression of observations to the useable restatement sample (62 unique restatements covering 101 restated firm years and 1,794 non restatement firm years with all available data). Restatement announcement dates are provided from the GAO data. The restated firm year data are based on the firm-years amended by the firm rather than the firm-year in which the restatement is announced. Table 2, Panel B reports descriptive statistics of the restated firm-years and non restatement firm years. Restated firm years are slightly smaller in assets and market value of equity, have significantly higher volatility of stock returns and stock return skewness. Raw D&O coverage limits of the restatement sample and non restatement sample are similar at a mean of $32.5 million and $34.8 million, respectively (t-value of 0.51).

Table 2: Descriptive Statistics

| **Panel A: Descriptive Statistics of Enforcement Action Manipulation Firm-Years Compared to Non-Manipulation Firm-Years** | | | | | |
|---|---|---|---|---|---|
| | **Manipulation Firm-Years (N=35)** | | **Non Manipulation Firm-Years (N=1,494)** | | |
| **Variable** | **Mean** | **Median** | **Mean** | **Median** | **T-stat for Diff in Means** |
| *D&O coverage limit ($ million)* | 66.219 | 19.750 | 37.816 | 19.750 | 1.57 |
| $ASSET_t$ *($ million)* | 6,381.26 | 426.29 | 2,459.64 | 386.92 | 1.86 |
| $MVE_t$ *($ million)* | 8,949.70 | 338.84 | 3,492.69 | 403.46 | 1.71 |
| $MB_t$ | 3.557 | 1.732 | 3.686 | 2.059 | 0.15 |
| $LEVERAGE_t$ | 0.339 | 0.186 | 0.600 | 0.198 | 2.07 |
| $DIVIDEND\ PAYOUT_t$ | 0.486 | 0.000 | 0.380 | 0.000 | 1.27 |
| $PP\&E_t$ | 0.513 | 0.431 | 0.560 | 0.441 | 0.65 |
| $RETURN\ STD\ DEV_t$ | 0.046 | 0.042 | 0.043 | 0.038 | 0.72 |
| $RETURN\ SKEWNESS_t$ | 0.008 | 0.209 | 0.408 | 0.355 | 1.59 |
| $RSST\ ACCRUALS_t$ | 0.002 | 0.002 | –0.002 | 0.012 | 0.13 |
| $CHANGE\ IN\ RECEIVABLES_t$ | –0.007 | –0.002 | 0.005 | 0.003 | 1.12 |
| $CHANGE\ IN\ INVENTORY_t$) | –0.004 | 0.000 | 0.003 | 0.000 | 1.11 |
| $\%\ SOFT\ ASSETS_t$ | 0.568 | 0.603 | 0.475 | 0.492 | 3.19 |
| $CHANGE\ IN\ CASH\ SALES_t$ | 0.146 | 0.062 | 0.160 | 0.063 | 0.25 |
| $CHANGE\ IN\ RETURN\ ON\ ASSETS_t$ | –0.007 | –0.014 | –0.012 | –0.004 | 0.18 |
| $ACTUAL\ ISSUANCE_t$ | 1.000 | 1.000 | 0.961 | 1.000 | 7.77 |
| **Panel B: Descriptive Statistics of Restated Firm-years Compared to Non-restated Firm-years** | | | | | |
| | **Restated Firm-Years (N=101)** | | **Non Restated** | | |
| **Variable** | **Mean** | **Median** | **Mean** | **Median** | **T-stat for Diff in Means** |
| *D&O coverage limit ($ million)* | 32.518 | 26.500 | 34.773 | 19.750 | 0.51 |
| $ASSET_t$ *($ million)* | 1,445.09 | 427.80 | 2,102.55 | 377.14 | 1.26 |
| $MVE_t$ *($ million)* | 1,778.10 | 327.58 | 2,572.42 | 365.08 | 1.39 |
| $MB_t$ | 3.095 | 2.022 | 3.442 | 2.033 | 0.53 |
| $LEVERAGE_t$ | 0.733 | 0.294 | 0.534 | 0.212 | 1.45 |
| $DIVIDEND\ PAYOUT_t$ | 0.139 | 0.000 | 0.327 | 0.000 | 5.18 |
| $PP\&E_t$ | 0.459 | 0.439 | 0.516 | 0.391 | 1.67 |
| $RETURN\ STD\ DEV_t$ | 0.052 | 0.059 | 0.045 | 0.041 | 3.11 |
| $RETURN\ SKEWNESS_t$ | 0.770 | 0.437 | 0.454 | 0.363 | 3.04 |
| $RSST\ ACCRUALS_t$ | 0.020 | 0.034 | –0.007 | 0.015 | 0.97 |
| $CHANGE\ IN\ RECEIVABLES_t$ | –0.022 | –0.003 | 0.001 | 0.001 | 2.33 |
| $CHANGE\ IN\ INVENTORY_t$) | 0.004 | 0.011 | 0.002 | 0.000 | 0.16 |
| $\%\ SOFT\ ASSETS_t$ | 0.583 | 0.600 | 0.492 | 0.515 | 3.58 |
| $CHANGE\ IN\ CASH\ SALES_t$ | 0.254 | 0.040 | 0.149 | 0.051 | 1.61 |
| $CHANGE\ IN\ RETURN\ ON\ ASSETS_t$ | –0.029 | 0.007 | –0.016 | –0.005 | 0.91 |
| $ACTUAL\ ISSUANCE_t$ | 0.851 | 1.000 | 0.945 | 1.000 | 2.61 |

*Table 2, Panels A and B present descriptive statistics of the variables used in the regressions. All variables are winsorized at the 1% and 99% level. Variable definitions are provided in the appendix.*

## RESEARCH AND EMPIRICAL FINDINGS

Expected Coverage Limit Model

Using variables that approximate the firm specific litigation risk, D&O coverage limit is modeled to estimate the expected level of insurance. The risk taken on by the covered executive and the firm's litigation risk should correlate with the amount of coverage offered by the firm. The prediction is that firm size (measured using total assets and market value of equity) to explain much of the variation in the D&O coverage limit (Boyer and Delvaux-Derome, 2002, Wynn 2008), because firm size and D&O insurance are highly correlated (84%). Firm size is a concise summary measure of the firm's ability to pay, i.e. the presence of "deep pockets." The market capitalization measure is an estimate of the market's perception of the firm. Plaintiffs' attorneys use experience and market value of equity to gauge coverage limits (Woodruff Sawyer & Co). The other components of the coverage limit model are the market to book ratio, leverage (Boyer and Delvaux-Derome, 2002), the proportion of assets that are composed of property, plant, and equipment, and stock return skewness and volatility (Wynn, 2008). The usage of these variables encompass both (i) the ability to pay (total assets, market value of equity, percentage of PP&E to total assets, and dividend payout ratio), and (ii) risk (leverage, stock return volatility and skewness) (Kim and Skinner, 2012). Corporate governance quality is not employed as a metric for litigation risk in the D&O coverage model, because Daines, Gow, and Larcker (2010) find that corporate governance and transparency ratings, such as those produced by Risk Metrics/ISS, Governance Metrics International and the Corporate Library, do not have predictive power for identifying lawsuit filings. The following regression specification is used to model D&O coverage:

$$Lnlimit_t = \alpha + \beta_1(Lnasset_t) + \beta_2(Lnmve_t) + \beta_3(MB_t) + \beta_4(Leverage_t) + \beta_5(Dividend\ Payout_t) + \beta_6(PP\&E_t) + \beta_7(Return\ Std\ Dev_t) + \beta_8(Return\ Skewness_t) + \varepsilon \quad (1)$$

Ordinary Least Squares estimated were obtained. Table 3 presents the results of the D&O coverage limit determinants model (equation 1) for the enforcement action analysis in column I (1,983 observations including manipulation and non-manipulation firm-years) and restatement analysis in column II (2,521 observations including restatement and non restatement firm-years). The model of coverage limit has explanatory power of 70.49% and 71.16% for the enforcement action analysis and restatement analysis samples, respectively. The expected coverage limit model is provided to show how well the model does in predicting coverage limit. The error term is not added as an independent variable in this model for the prediction of enforcement releases and accounting restatements. Rather, the coverage limit and its determinants are used in the enforcement releases and accounting restatements models to represent the impact of unexpected coverage limit on the likelihood of an enforcement release and restatement. Total assets has stronger explanatory power (coefficients of 0.31 in column I and 0.24 in column II) than market value of equity (coefficients of 0.14 in column I and 0.16 in column II), which are both statistically significant at the 1% level or better. The D&O coverage limit appears to be a direct measure of the firm's ability to pay; higher coverage limits are associated with lower growth, higher levered, higher dividend paying, capital intensive firms with higher stock return volatility and lower return skewness.

Table 3: Model of D&O Coverage Limit

| | (I) Enf. Action Analysis | (II) Restatement Analysis |
|---|---|---|
| **Variable** | **Coefficient Estimate** | **Coefficient Estimate** |
| Intercept | 0.011 | 0.330*** |
| $LNASSET_t$ | 0.311*** | 0.238*** |
| $LNMVE_t$ | 0.141*** | 0.163*** |
| $MB_t$ | –0.005 | –0.009*** |
| $LEVERAGE_t$ | 0.027* | 0.060*** |
| $DIVIDEND\ PAYOUT_t$ | 0.102*** | 0.091*** |
| $PP\&E_t$ | 0.135*** | 0.327*** |
| $RETURN\ STD\ DEV_t$ | 5.630*** | 3.990*** |
| $RETURN\ SKEWNESS_t$ | –0.028** | –0.057** |
| Adjusted $R^2$ | 70.49% | 71.16% |
| Observation Count | 1,983 | 2,521 |

*Table 3 presents the directors' and officers' coverage limit prediction model. The estimated equation is:* $LNLIMIT_t = \alpha + \beta_1(LNASSET_t) + \beta_2(LNMVE_t) + \beta_3(MB_t) + \beta_4(LEVERAGE_t) + \beta_5(DIVIDEND\ PAYOUT_t) + \beta_6(PP\&E_t) + \beta_7(RETURN\ STD\ DEV_t) + \beta_8(RETURN\ SKEWNESS_t) + \varepsilon$. *Variable definitions are provided in the appendix. ***, **, and * indicate p-values of 1%, 5%, and 10% respectively (based on two-tailed tests). The p-values are based on robust standard errors. Column I uses the set of enforcement action manipulation firm-years and non manipulation firm years (1,983 observations). Column II uses the set of restatement firm-years and non restatement firm-years (2,521 observations). The coverage limit prediction model is presented to get an idea of model performance in predicting expected coverage limit. This table shows the regression estimate of the following equation:*

Enforcement Action Prediction Model

D&O coverage limit is purchased to approximate litigation risk; for this reason, the coverage limit level itself, rather the unexpected level of coverage purchased is used to ascertain whether opportunism drives the purchase. The prediction model with financial statement variables (Table 4, model 1) in in Dechow et al. (2011) is supplement with the level of D&O coverage limit and its determinants. The following regression equation is used to identify the effect of unexpected coverage on enforcement action likelihood:

$$
\begin{aligned}
Enf\ Action_t = \quad & (Enforcecment\ action\ determinants) \\
& \alpha + \beta_1(RSST\ Accruals_t) + \beta_2(Change\ in\ Receviables_t) \\
& + \beta_3(Change\ in\ Inventory_t) + \beta_4(\%\ Soft\ Assets_t) \\
& + \beta_5(Change\ in\ Cash\ Sales_t) \\
& + \beta_6(Change\ in\ Return\ on\ Assets_t) + \beta_7(Actual\ Issuance_t) \\
& \quad (Coverage\ limit\ determinants) \\
& + \beta_8(Lnlimit_t) + \beta_9(Lnasset_t) + \beta_{10}(Dividend\ Payout_t) \\
& + \beta_{11}(MB_t) + \beta_{12}(Leverage_t) + \beta_{13}(Dividend\ Payout_t) \\
& + \beta_{14}(PP\&E_t) + \beta_{15}(Return\ Std\ Dev_t) + \beta_{16}(Return\ Skewness_t) + \epsilon
\end{aligned}
\tag{2}
$$

Ordinary Least Squares Estimates were obtained. Table 4 presents the findings on the effect of unexpected D&O coverage on regulatory enforcement action likelihood. The coefficient on the unexpected D&O coverage limit is 0.726 (statistically significant at the 5% level; marginal effect of 0.013). The findings show that high unexpected D&O coverage is consistent with a higher probability of enforcement action ex ante (i.e. higher unexpected coverage predictive of a higher likelihood of AAER occurrence). Therefore, enforcement action firms appear to invest in higher D&O coverage limits in anticipation of the manipulation. The McFadden pseudo $R^2$ and Craig-Uhler pseudo $R^2$ are 11.32% and 2.44%, respectively. A number of other approaches are used to evaluate model predictive ability. One particular measure of note is the area under the receiver operating characteristic (ROC), or AUC (Hosmer and Lemeshow, 2000, Long and Freese, 2006). The ROC "plots the probability of detecting a true signal (sensitivity) and false signal

(1 – specificity) for the entire range of possible cutpoints" (Hosmer and Lemeshow, 2000). The AUC provides a measure of the model's ability to discriminate. AUC is 0.785 which is larger than 0.5, indicative of acceptable discriminatory ability. A value of 0.5 indicates no ability to discriminate (might as well toss a coin) while a value of 1 indicates perfect ability to discriminate, so the effective range of AUC is from 0.5 to 1.0. Therefore, an AUC of 0.5 suggests no discriminatory ability, a range of 0.7 and 0.8 indicates acceptable discriminatory ability, 0.8-0.9 implies excellent discrimination, and above 0.9 is outstanding discrimination (Hosmer and Lemeshow, 2000). Furthermore, the Hosmer-Lemeshow chi-squared statistic is insignificant (p-value of 0.822) also indicative of good model fit (Hosmer-Lemeshow, 2000). These measures indicate that the model has good discriminatory ability and predictive ability.

The enforcement action sample used in this paper is quite different from the sample used in Dechow et al. (2011). Table 4 includes 35 manipulating firms whereas the Dechow et al. paper uses 494 manipulating firm-years. The difference is largely due to the D&O data restriction on the sample used in this paper; also, the Dechow et al. sample does not appear to use DOJ enforcement actions. The coefficient of interest tested in this paper is that on the unexpected coverage limit. Because of the differences in samples, the coefficients on the enforcement action determinants identified in Dechow et al. (2011) are quite different than those presented in Table 4. The weaker results on the financial statement accrual variables are consistent with the findings in Stubben (2010). The study examines the efficacy of revenue-based models compared to accrual-based models in predicting manipulation using SEC enforcement actions, and finds that revenue-based models do a better job of detecting manipulation than accrual models. However, the statistics indicate decent discriminatory ability and predictive ability, suggesting confidence in the inferences on the impact of unexpected coverage limit on enforcement action probability.

Table 4: Effect of Unexpected D&O Coverage Limit on Enforcement Action Likelihood

| Variable | Coefficient Estimate | Marginal Effect |
|---|---|---|
| Intercept | –20.571*** | |
| $RSST\ ACCRUALS_t$ | 0.143 | *0.003* |
| $CHANGE\ IN\ RECEIVABLES_t$ | –3.908* | *–0.071* |
| $CHANGE\ IN\ INVENTORY_t$ | –5.460* | *–0.099* |
| $\%\ SOFT\ ASSETS_t$ | 1.857** | *0.033* |
| $CHANGE\ IN\ CASH\ SALES_t$ | –0.026 | *–0.0004* |
| $CHANGE\ IN\ RETURN\ ON\ ASSETS_t$ | 0.580 | *0.011* |
| $ACTUAL\ ISSUANCE_t$ | 12.345*** | *0.371* |
| $LNLIMIT_t$ | 0.726** | *0.013* |
| $LNASSET_t$ | 0.716*** | *0.012* |
| $LNMVE_t$ | –0.066 | *–0.001* |
| $MB_t$ | 0.060 | *0.001* |
| $LEVERAGE_t$ | –0.647*** | *–0.012* |
| $DIVIDEND\ PAYOUT_t$ | 0.401 | *0.007* |
| $PP\&E_t$ | 0.315 | *0.006* |
| $RETURN\ STD\ DEV_t$ | 33.606*** | *0.609* |
| $RETURN\ SKEWNESS_t$ | –0.375** | *–0.007* |
| Pseudo $R^2$ (McFadden) | 11.32% | |
| Pseudo $R^2$ (Craig-Uhler) | 2.44% | |
| Area under ROC Curve | 0.785 | |
| Hosmer-Lemeshow p-value | (0.822) | |
| Observation Count | 1,529 | |

*Table 4 presents the effect of unexpected D&O coverage limit on the probability of a regulatory enforcement action. The estimated equation is:* $ENF\ ACTION_t = \alpha + \beta_1(RSST\ ACCRUALS_t) + \beta_2(CHANGE\ IN\ RECEIVABLES_t) + \beta_3(CHANGE\ IN\ INVENTORY_t) + \beta_4(\%\ SOFT\ ASSETS_t) + \beta_5(CHANGE\ IN\ CASH\ SALES_t) + \beta_6(CHANGE\ IN\ RETURN\ ON\ ASSETS_t) + \beta_7(ACTUAL\ ISSUANCE_t) + \beta_8(LNLIMIT_t) + \beta_9(LNASSET_t) + \beta_{10}(LNMVE_t) + \beta_{11}(MB_t) + \beta_{12}(LEVERAGE_t) + \beta_{13}(DIVIDEND\ PAYOUT_t) + \beta_{14}(PP\&E_t) + \beta_{15}(RETURN\ STD\ DEV_t) + \beta_{16}(RETURN\ SKEWNESS_t) + \varepsilon.$ *Variable definitions are provided in the appendix. ***, **, and * indicate p-values of 1%, 5%, and 10% respectively (based on two-tailed tests). The p-values are based on robust standard errors that control for heteroskedasticity and serial correlation. Marginal effects of the coefficients are reported next to the coefficients. The first set of coefficients,* $\beta_1$ *through* $\beta_7$*, represent enforcement action determinants, whereas the coefficients* $\beta_9$ *through* $\beta_{16}$ *are the D&O coverage limit determinants. The coefficient of interest is* $\beta_8$*. This table shows the regression estimate of the following equation:*

To further investigate the D&O coverage limit of enforcement action firms, Table 5 summarizes the change in coverage limit around the enforcement period. In general, coverage limits do not change much from year to year; insurance policies can cover multiple years. In the entire sample of firms with D&O coverage limits (not conditional on *Compustat* or *Crsp* data availability), over 60% of the one–year change in coverage limit is zero percent, and the sample's average annual change in coverage is 19%. The stickiness of D&O coverage limits from year to year is confirmed by the statistic at the bottom of Table 5; the annual percentage change in D&O coverage for manipulation and non manipulation firm years is on average 0.0%. Therefore, changes in coverage limit are infrequent and are not large from year to year. However, Table 5 shows that there is some opportunism with respect to the coverage limit around the misreporting period (violation periods of enforcement actions can span multiple years). The mean annualized change in purchased coverage during the violation period is 28.39% indicating that firms may raise their coverage during the manipulation period opportunistically. The mean percentage change in coverage limit from the year before to the first year of manipulation is 67.54%, which implies that firms ramp up their coverage in anticipation of the manipulation. To this point, one of the enforcement release firms increased their D&O coverage limit by 449% from year t-1 (year prior to violation period) to year t (first year of violation period). Enforcement action firms subsequently lower coverage by 1.34% from the last year of the violation to the year after the enforcement action period. Given the fact that coverage limits are slow to move and infrequently change from year to year, these changes prior to and during the violation period display opportunism using D&O with regard to financial reporting manipulation.

Table 5: Opportunism within the Misreporting Period

| | |
|---|---|
| Enforcement action obs:<br>mean annualized change in D&O coverage limit during enforcement period | +28.39% |
| Enforcement Action obs:<br>mean percentage change in D&O coverage limit from year t-1 to year t | +67.54% |
| Enforcement action obs:<br>mean percentage change in D&O coverage limit from year t to year t+1 | – 1.34% |
| All obs (enforcement action and non enforcement action) firms: average percentage in D&O coverage limit | 0.00% |

*Annual change in D&O coverage limit for enforcement action observations around enforcement period in comparison to all observations' change in limit*

Accounting Restatement Prediction Model

There is mixed evidence on accounting restatement determinants. It is not clear whether corporate governance factors are predictive of restatements; CEO equity incentives do not appear to predict restatements but the sensitivity of CEO's option portfolio to stock price and CEO holdings of in the money stock options may be related to restatements (Burns and Kedia, 2006, Efendi et al., 2007). Similarly, the percentage of independent directors on the board is not a restatement determinant, but a dual CEO-chairman of the board or CEO-founder is predictive of restatements (Agrawal and Chadha, 2005, Efendi et al., 2007). Because of the mixed findings on restatement determinants, The enforcement action model variables are used as restatement determinants. The following regression equation estimates the effect of unexpected coverage on restatement likelihood:

$$Restatement_t = \alpha + \beta_1(Lnasset_t) + \beta_2(Lnasset_t) + \beta_3(Lnmve_t) + \beta_4(MB_t) + \beta_5(Leverage_t) + \beta_6(Dividend\ Payout_t) + \beta_7(PP\&E_t) + \beta_8(Return\ Std\ Dev_t) + \beta_9(Return\ Skewness_t) + \varepsilon \quad (3)$$

The following regression specification supplements equation [3] with the enforcement action determinants:

$$Restatement_t = \alpha + \beta_1(RSST\ Accruals_t) + \beta_2(Change\ in\ Receviables_t) + \beta_3(Change\ in\ Inventory_t) + \beta_4(\%\ Soft\ Assets_t) \quad (4)$$

$$+ \beta_5(Change\ in\ Cash\ Sales_t)$$
$$+ \beta_6(Change\ in\ Return\ on\ Assets_t) + \beta_7(Actual\ Issuance_t)$$
$$+ \beta_8(Lnlimit_t) + \beta_9(Lnasset_t) + \beta_{10}(Dividend\ Payout_t)$$
$$+ \beta_{11}(MB_t) + \beta_{12}(Leverage_t) + \beta_{13}(Dividend\ Payout_t)$$
$$+ \beta_{14}(PP\&E_t) + \beta_{15}(Return\ Std\ Dev_t) + \beta_{16}(Return\ Skewness_t) + \epsilon$$

Ordinary Least Squares estimates were obtained for both equations 3 and 4. Table 6 models the likelihood of aggressive accounting (detected using earnings restatements). The first set of results includes D&O coverage limit and its determinants as predictors of restatements; positive unexpected coverage is predictive of an earnings restatements (coefficient of +0.533, statistically significant at the 1% level based on a two-tailed test). Adding in the financial statement determinants, the coefficient on unexpected coverage limit remains positive and statistically significant (coefficient of +0.631, statistically significant at the 5% level based on a two-tailed test). Both models have acceptable discrimination (AUC of 0.707 and 0.785, respectively).

Table 6: Effect of Unexpected D&O Coverage Limit on Restatement Likelihood

| | **Unexpected Coverage Limit Only Model** | | **Full Model** | |
|---|---|---|---|---|
| **Variable** | **Coefficient Estimate** | **Marginal Effect** | **Coefficient Estimate** | **Marginal Effect** |
| Intercept | –9.980*** | | –5.556*** | |
| *RSST ACCRUALS$_t$* | | | 1.712*** | *0.080* |
| *CHANGE IN RECEIVABLES$_t$* | | | –7.989*** | *–0.375* |
| *CHANGE IN INVENTORY$_t$* | | | 5.133** | *0.241* |
| *% SOFT ASSETS$_t$* | | | 1.862*** | *0.087* |
| *CHANGE IN CASH SALES$_t$* | | | 0.402** | *0.019* |
| *CHANGE IN RETURN ON ASSETS$_t$* | | | –0.382 | *–0.018* |
| *ACTUAL ISSUANCE$_t$* | | | –1.245** | *–0.058* |
| *LNLIMIT$_t$* | 0.533*** | *0.032* | 0.631** | *0.030* |
| *LNASSET$_t$* | 0.471*** | *0.028* | 0.277 | *0.013* |
| *LNMVE$_t$* | –0.478*** | *–0.028* | –0.257 | *–0.012* |
| *MB$_t$* | 0.042* | *0.002* | 0.025 | *0.001* |
| *LEVERAGE$_t$* | –0.157* | *–0.009* | 0.015 | *0.001* |
| *DIVIDEND PAYOUT$_t$* | –0.366 | *–0.022* | –1.605*** | *–0.075* |
| *PP&E$_{t\,t}$* | –0.660*** | *–0.039* | 0.429 | *0.020* |
| *RETURN STD DEV $_t$* | –7.532 | *–0.449* | 8.967 | *0.421* |
| *RETURN SKEWNESS$_{t\,t}$* | 0.403** | *0.024* | 0.275** | *0.013* |
| Pseudo $R^2$ (McFadden) | 6.08% | | 12.68% | |
| Pseudo $R^2$ (Craig-Uhler) | 2.92% | | 1.51% | |
| Area under ROC Curve | 0.7072 | | 0.7851 | |
| Hosmer-Lemeshow p-value | (<0.0001) | | (0.329) | |
| Observation Count | 2,521 | | 1,895 | |

*Table 6 presents the effect of unexpected D&O coverage limit on the probability of an accounting restatement. The estimated equation (unexpected coverage limit only) is: RESTATEMENT$_t$ = α + $\beta_1$(LNLIMIT$_t$) + $\beta_2$(LNASSET$_t$) + $\beta_3$(LNMVE$_t$) + $\beta_4$(MB$_t$) + $\beta_5$(LEVERAGE$_t$) + $\beta_6$(DIVIDEND PAYOUT$_t$) + $\beta_7$(PP&E$_t$) + $\beta_8$(RETURN STD DEV $_t$) + $\beta_9$(RETURN SKEWNESS$_t$) + ε. The estimated equation (full model) is: RESTATEMENT$_t$ =α + $\beta_1$(RSST ACCRUALS$_t$)+ $\beta_2$(CHANGE IN RECEIVABLES$_t$) + $\beta_3$(CHANGE IN INVENTORY$_t$) + $\beta_4$(% SOFT ASSETS$_t$) + $\beta_5$(CHANGE IN CASH SALES$_t$) + $\beta_6$(CHANGE IN RETURN ON ASSETS$_t$) + $\beta_7$(ACTUAL ISSUANCE$_t$) + $\beta_8$(LNLIMIT$_t$) + $\beta_9$(LNASSET$_t$) + $\beta_{10}$(LNMVE$_t$) + $\beta_{11}$(MB$_t$) + $\beta_{12}$(LEVERAGE$_t$) + $\beta_{13}$(DIVIDEND PAYOUT$_t$) + $\beta_{14}$(PP&E$_t$) + $\beta_{15}$(RETURN STD DEV $_t$) + $\beta_{16}$(RETURN SKEWNESS$_t$) + ε. Variable definitions are provided in the appendix. ***, **, and * indicate p-values of 1%, 5%, and 10% respectively (based on two-tailed tests). The p-values are based on robust standard errors that control for heteroskedasticity and serial correlation. Marginal effects of the coefficients are reported next to the coefficients. In the unexpected coverage limit only model, the coverage limit and its determinants are the sole predictors of a restatement firm-year. In the full model, the first set of coefficients, $\beta_1$ through $\beta_7$, represent restatement determinants, whereas the coefficients $\beta_9$ through $\beta_{16}$ are the D&O coverage limit determinants. The coefficient of interest is $\beta_8$.*

The full model has a McFadden pseudo $R^2$ of 12.68%, and a Hosmer-Lemeshow p-value of 0.329. The implication of these results is that managers opportunistically rely on excessive coverage for financial-reporting decision-making, because higher than expected D&O coverage increases the probability of an earnings restatement, all else equal. D&O insurance therefore does not alleviate the moral hazard problem

given that managers' opportunism affects financial reporting decisions. Therefore, the opportunism hypothesis is confirmed in the enforcement action and restatement settings. The findings indicate that opportunism in financial reporting can be detected using excess coverage amounts, testing the existence of aggressive accounting using AAERs and earnings restatements.

## CONCLUSION

This study expands our understanding of the role managerial private information (directors' and officers' liability insurance) plays in financial reporting decisions. This paper provides evidence on whether opportunism from D&O insurance coverage results in an overly-buffered executive increasing the probability of aggressive accounting choices. To test the research question, the study uses survey data on D&O insurance coverage limits, enforcement actions from the DOJ and SEC, earnings restatements from the GAO, and financial statement variables from Compustat. The findings show that litigation risk proxies like firm size, market capitalization, capital intensity, growth, dividend payout, leverage, return skewness and volatility are determinants of the amount of coverage. Furthermore, opportunism in financial reporting can be detected using excess coverage amounts in the prediction of enforcement actions and accounting restatements. The likelihood of an enforcement action or earnings restatement is increasing in unexpected coverage, suggesting that executives rely on the insulation from investor recourse when making financial reporting decisions. There are a few limitations to my study.

To the extent that the need for restatement or cause for an enforcement action goes undetected in some firms, the non-restatement and non-manipulation samples contain firms that should be in the test samples. Furthermore, using the excess value of coverage limit in predicting earnings restatements and regulatory action relies on the fact that the model of coverage is correctly specified. Also, the enforcement action sample (due to the D&O data requirement) is small in comparison to the sample used in Dechow et al. (2011), resulting in different inferences on the financial statement variables used in their model. Overall, this study has implications for how D&O insurance can have an unexpected impact on managerial decision-making, and has potential policy implications for disclosure of coverage limit in the United States.

## APPENDIX

Variable Definitions

The following provides definitions of the variables used in the tables in alphabetical order. For all enforcement action tests, year t represents the violation year for manipulation firms, and the firm-year for non manipulation firms. For all restatements tests, year t represents the amended year for restatement firms, and the firm-year for non restatement firms.

| Variable | Definition |
|---|---|
| $ENF\ ACTION_t$ | Equals 1 if a violation period of a regulatory enforcement action occurred during the year, and 0 otherwise |
| $ACTUAL\ ISSUANCE_t$ | As defined in Dechow et al. (2011): Equals 1 if the firm issued securities during year t |
| $CHANGE\ IN\ CASH\ SALES_t$ | As defined in Dechow et al. (2011): percentage change in cash sales in year t (sales – accounts receivable) |
| $CHANGE\ IN\ INVENTORY_t$ | As defined in Dechow et al. (2011): Δinventory / average total assets in year t |
| $CHANGE\ IN\ RECEIVABLES_t$ | As defined in Dechow et al. (2011): Δaccounts receivable / average total assets in year t |
| $CHANGE\ IN\ RETURN\ ON\ ASSETS_t$ | As defined in Dechow et al. (2011): ($earnings_t$ / average total $assets_t$) - ($earnings_{t-1}$ / average total $assets_{t-1}$) |
| $DIVIDEND\ PAYOUT_t$ | Dividend payout ratio in year t |
| $LEVERAGE_t$ | Debt to equity ratio in year t |
| $LNASSETS_t$ | Natural log of total assets at the end of year t |
| $LNLIMIT_t$ | Natural log of the firm's total directors' and officers' insurance coverage limit less deductible at the end of year t |
| $LNMVE_t$ | Natural log of market value of equity at the end of year t |
| $MB_t$ | Market value of equity scaled by book value of equity at the end of year t |
| $\%\ SOFT\ ASSETS_t$ | As defined in Dechow et al. (2011): (Total assets – PP&E – cash and cash equivalents) / total assets in year t |
| $PP\&E_t$ | Property, plant and equipment at the end of year t scaled by beginning of year t total assets |
| $RESTATEMENT_t$ | Equals 1 if a firm restated (amended) its financial statement for the year, and 0 otherwise |

Variable Definitions, *Continued*

| | |
|---|---|
| ***RETURN SKEWNESS$_t$*** | **Skewness of the Firm's 12-Month Return** |
| *RETURN STD DEV$_t$* | Standard deviation of the firm's 12-month returns |
| *RSST ACCRUALS$_t$* | As defined in Dechow et al. (2011):<br>(DWC + DNCO + DFIN)/average total assets in year t, where<br><br>WC = [current assets – cash and short-term investments] –[current liabilities – debt in current liabilities ];<br><br>NCO = [total assets – current assets – investments and advances] – [total liabilities – current liabilities – long-term debt];<br><br>FIN=[short-term investments + long-term investments]–[long-term debt + debt in current liabilities + preferred<br>stock] |

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# TAX COMPLIANCE OF SMALL AND MEDIUM ENTERPRISES: EVIDENCE FROM INDONESIA

Fany Inasius, Bina Nusantara (Binus) University

**ABSTRACT**

*It has been argued that regulatory requirements on business, especially those on SMEs can be a constraint on their growth. Indonesian Small and Medium Enterprises (SMEs) play a significant role in the national economy. This paper measures the tax compliance rate of particular individual retailers known as individual taxpayers on SMEs with annual income ranging from IDR 600 millions up to IDR 4.8billion (around USD 400,000 with the exchange rate at the time when the research was undertaken) in Indonesia. Four tax compliance variables were examined namely the perception of tax rate, the referral group, the probability of being audited and the tax knowledge. From 319 respondents, who are individual retailers, the result shows the income tax rate is negatively correlated to tax compliance while probability of being audited, referral group, and tax knowledge are positively correlated by taxcompliance. Tax knowledge, however, has a more significant impact on individual tax compliance*

**JEL:** H20

**KEYWORDS**: Tax Compliance, SMEs, Individual Taxpayers, Retailers

## INTRODUCTION

SMEs in Indonesia, as in many countries, play a significant role for the national economy. They have historically been the main players in domestic activity with the number of SMEs reached 56 million units, accounted for approximately 60 percent of total GDP and holds 97 percent of the total work force in 2012 (Ministry of Indonesian SME, 2012).

Since reform of tax laws in Indonesia in 2008, the number of Taxpayers has increased from year to year. In 2008, of 10,106,159 taxpayers, 3,150,966 registered Taxpayers are individual business taxpayers while in 2012 the number of individual business Taxpayers increased to 4,521,395 from 25,065,810 taxpayers (Inasius, 2014). Understanding of tax knowledge influences taxpayers' compliance. Therefore, a study of Taxpayer compliance is important to understand the behavior of taxpayers. Several studies have been conducted on tax compliance such as Clotfelter (1983), Alm (1991), Eriksen and Fallan (1996), Evans et al. (2005), Kirchler (2007). For the purpose of this paper, the definition of tax compliance based on Kirchler (2007) is defined the willingness of taxpayers to comply with tax laws, to report and pay all taxes on time.

Previous studies have found that compliance costs fall disproportionately on small firms (Sandford et al. 1989). Therefore, in terms of the biggest contribution of Indonesia SMEs to the national Economy, the purpose of this paper is to measure the correlation of four independent variables on the tax compliance level of individual SMEs retailers in Indonesia. The four independent variables consist of the perception of tax rate, the referent group, the probability of being audited and the tax knowledge.

In the international context, this paper contributes to the existing literature on tax compliance by adding observations made from the Asian perspective. On the other hand, in the local context, this study observes the important tax compliance factors to Indonesia. This paper is organized as follows: first, the literature

is reviewed. Second the methodology of the research is presented. The result of the testing is presented in the third part of this paper. Finally the last part concludes this paper

## LITERATURE REVIEW

From one country to another the definition of SMEs varies and so do the definition of SMEs in Indonesia. In Indonesia, the SME Act 2008 defines a SME based on turnover. A micro company is one that has turnover not exceeding 300 million rupiah, a small company has turnover not exceeding 2.5 billion rupiah and finally a medium-sized company has turnover not exceeding 50 billion rupiah. Business turnover is one of the most accepted criteria in determining tax rules for SMEs as there are separate definitions of it for tax purposes.

International experience shows that regulatory burdens appear to fall disproportionately on small medium enterprises. In recognition of their contribution to the national economy SMEs should be supported by the government particularly in the regulatory burden and taxation (Pope, 2008). The complexity of taxation could be best measured by tax compliance cost (Pope, 1993b:70, Simon James et al., 1998:32). The definition of tax compliance is defined by Alm (1991) and Jackson and Milliron (1986) as the reporting of all incomes and payment of all taxes by fulfilling the provisions of laws, regulations and court judgments. Furthermore, according to Kirchler (2007), tax compliance is the most neutral term to describe taxpayers' willingness to pay their taxes.

Previous studies on the probability of being audited, the influence of referent groups and tax knowledge have been done by Palil et al. (2011). Associated with the probability of being audited, they argued that the increase in the number of audit samples may improve tax compliance. Furthermore, with regard to the referent group they argue that personal Cultivating awareness of compliance is important. Finally, tax knowledge becomes the main factor that affects tax compliance behavior in Malaysia. The previous research about tax rates that influences taxpayers' decisions to comply with tax laws has been claimed by Clotfelter (1983: 363) that tax rates is not the only policy with the potential to discourage tax evasion but the tax rate is an important factor in determining tax compliance behavior although the exact impact is still unclear and debatable (Kirchler, 2007: 114). Furthermore, Ali et al (2001) and Torgler (2007) claimed that raising marginal tax rates will likely encourage taxpayers to evade tax more while lowering tax rates does not necessarily increase tax compliance (Kirchler, 2007)

In term of tax audit, previous studies claimed that audits have a positive impact on tax evasion (Jackson and Jaouen, 1989; Shanmugam, 2003; Dubin, 2004). These findings suggest that tax audits can play an important role and their central role is to increase voluntary compliance in self-assessment systems. Furthermore, Witte and Woodbury (1985) also complement in their study of small proprietors that tax audits have a significant role in tax compliance. Butler (1993) also supports these findings that tax audits can change compliance behavior from negative to positive. Furthermore, Evans et al. (2005) in their studies in Australia found that the type of audit on SMEs has a significant indirect impact on tax compliance in terms of record keeping. On the other hand, previous studies by Young (1994) and Slemrodetal (2001) found that probability of being audited was negatively correlated with compliance behavior.

Previous studies in ascertaining the importance of referent groups are also claimed by Clotfelter (1983) that referent groups play a significant role in evasion although it was not clearly discussed which was stronger: family members or friends. Furthermore, Hasseldine, Kaplan and Fuller (1994) report that the more respondents know the evaders, the more under-reporting of income may happen. In term of tax knowledge, Eriksen and Fallan (1996) argues that the level of education received by taxpayers is an important factor that contributes to the general understanding about taxation especially regarding the laws and regulations of taxation. On the other hand, previous studies by Lewis (1982) showed that low tax knowledge correlates with negative attitude toward taxation. Furthermore, Eriksen et al. (1996: 398) claimed that tax attitudes

can be improved through better tax knowledge and thus this will in turn increase compliance and reduce the inclination to evade taxes.

## RESEARCH METHODOLOGY

The following hypotheses were tested in order to answer the research objective; the tax compliance in Indonesia.

H1 Perception of tax rate is positively correlated with tax compliance
H2 Referral group is positively correlated with tax compliance
H3 Probability of being audited is positively correlated with tax compliance
H4 Tax knowledge is positively correlated with tax compliance

The survey was carried out from November 2013 up to January 2014 in Jakarta. Respondents were individual retailers located both in traditional markets as well as in shopping centers. The data is directly distributed to respondents in five regions that consist of Central Jakarta, West Jakarta, North Jakarta, East Jakarta and South Jakarta. The distribution is done by 50 students for the five regions. The answers are obtained in the following weeks after the distribution of questionnaires. In addition, the location of the survey concentrated in Jakarta Province which is the center of the economy with the largest percentage of tax revenues in Indonesia. This is proved from the total domestic tax receipts around 977 trillion rupiah where about a third comes from Jakarta (Inasius, 2013: 152).

The questionnaire in the survey consists of 20 questions. In order to improve the validity and reliability a pilot survey was conducted on a group of 30 retailers in various sectors before a total number of 1000 questioners were distributed to individual retailers throughout Jakarta who were selected at random from the traditional and modern market. The respondents were asked to indicate their degree of agreement with five statements (1= completely disagree to 5= completely agree; also, a "do not know option which was defined as a missing value for the statistical analyses).

The questionnaire was prepared in both Indonesia and English versions to facilitate respondents and was divided into four variables of interest that are the perception of tax rate, influence of referent group, probability of being audit and tax knowledge. As illustrated in Table 1, a total of four tax compliance variables were examined namely the perception of tax rate, the influence of referent group, the probability of being audit and the tax knowledge.

Table 1: The Descriptions of Variables

| Variables | Symbol | Description |
|---|---|---|
| Tax compliance | TC | Minimum total score for each respondent is 20 (1 mark times 20 questions- non compliant) and maximum score is 100 (5 times 20 questions- very compliant). |
| Perception of Tax Rate | TR | Taxpayers' perception on tax rate. Minimum score is 4 (1 times 4 questions- non compliant) and maximum is 20 (5 times 4 questions- very compliant). |
| Referral group | RG | The referral group (family members and closed friends). Minimum score is 4 (non compliant) and maximum is 20 (very compliant). |
| Probability of being audited | PA | Probability of taxpayer being audit by the tax authority. Minimum score is 4 (non compliant) and maximum is 20 (very compliant) |
| Tax knowledge | TK | Minimum score is 4 (non compliant) and maximum is 20 (very compliant) |

To test the hypotheses on tax compliance, data was estimated using multiple regressions. The following equation was used to test the hypotheses and establish the tax compliance determinants.

$$TC = \alpha + \beta 1TR + \beta 2RG + \beta 3PA + \beta 4TK + \varepsilon_i \quad (1)$$

Where: 1.) TC = Tax Compliance, 2.) TR = Perception of Tax rate, 3.) RG = Referral Group, 4.) PA = Probability of Being Audited, 5.) TK = Tax Knowledge.

## RESULTS

Out of 1,000 surveys directly distributed to respondents who are individual retailers and have business turnover less than USD 4 million, 280 were returned with one survey being damaged. The sampling region covers markets and shopping centers across Jakarta with divisions including Central Jakarta, West Jakarta, North Jakarta, East Jakarta and South Jakarta. Each area covers among 2 to 4 shopping centers. Moreover, the surveys were distributed and collected at the time of meeting with respondents who were chosen at random.

The respondents consist of 168 (60%) females and 111 (40%) males. A minimum age of 21 years old was considered reasonable. Overall, respondents aged between 21and 45 years old made up the largest portion with 210 respondents (75%) and a total of 218 (78%) were married.

The following Table 2 illustrates the Pearson correlation matrix for dependent and independent variables. Table 3 provides results of tax compliance in which all independent variables except for the perception of tax rate were found to be significantly correlated with TC ($p<0.01$). The highest correlation occurred between TC and TK followed by RG and PA.

Table 2: Pearson Correlation Matrix for Dependent & Independent Variables

| | Tax.Compliance | Group | Audited | Tax.Knowledge | Tax.rate |
|---|---|---|---|---|---|
| Tax Compliance | 1 | 0.328** | 0.322** | 0.365** | 0.111 |
| Group | 0.328** | 1 | 0.813** | 0.826** | 0.547** |
| Audited | 0.322** | 0.813** | 1 | 0.809** | 0.525** |
| Tax Knowledge | 0.365** | 0.826** | 0.809** | 1 | 0.469** |
| Tax.rate | 0.111 | 0.547** | 0.525** | 0.469** | 1 |

*Table 2 shows Pearson Correlation Matrix. The first column shows the dependent variable for tax compliance and group audited, tax knowledge and tax rate for independent variable. The second column reports the correlation between the dependent variable and independent variable. The next columns report the correlation between the independent variable and dependent variable as well as the independent variable and independent variable. *Correlation is significant at the 0.1 level (2-tailed), **Correlation is significant at the 0.05 level (2-tailed), ***Correlation is significant at the 0.01 level (2-tailed)*

To test the hypothesis on tax compliance the data was estimated using a multiple regressions models. Based on this multiple regression, results in Table 3 show that tax compliance was influenced by four variables namely TK ($\beta$=0.365), RG ($\beta$=0.328), PA ($\beta$=0.322) and TR ($\beta$=0.111). TK is the only significant predictor.

The findings suggest that high tax knowledge would increase tax compliance and also become a significant factor in determining tax compliance. Therefore, hypothesis H4 (tax knowledge is positively correlated with tax compliance) is accepted. On the other hand, the perception of tax rate, the referral group and probability of being audited would discourage tax compliance.

## CONCLUSION

The objective of this research is to examine factors influencing taxpayer's behavior. Four variables of tax compliance were examined in this study, namely the perception of tax rate, the referral group, the probability of being audited and tax knowledge. Using direct questions, results suggest that tax compliance was influenced by tax knowledge, the referent group, the perception of tax rate and the probability of being audited. Interestingly, however, tax knowledge becomes the strongest predictor affecting tax compliance.

In contrast, the perception of tax rate, the referent group and the probability of being audited, although somewhat related are not significant enough to influence tax compliance. Furthermore, it seems that tax knowledge induces tax compliance, thus hypothesis 4 was accepted and supports the results by Eriksen and Fallan (1996).

Table 3: Multiple Regression- Dependent Variable: Tax Compliance

| Variables | Coefficients | t | Sig. | VIF |
|---|---|---|---|---|
| Tax Rate | -0.113 | -1.667 | 0.097 | 1.469 |
| Ref Group | 0.103 | 0.907 | 0.365 | 4.111 |
| Audited | 0.084 | 0.789 | 0.431 | 3.666 |
| Tax Knowledge | 0.264 | 2.420 | 0.016 | 3.822 |
| Model Fit: | | | | |
| R | 0.380 | | | |
| $R^2$ | 0.145 | | | |
| Adjusted $R^2$ | 0.132 | | | |
| Standard error | 2.375 | | | |
| F statistic | 11.592 | | | |

*This Table shows the multiple regression of tax compliance as dependent variable. The fourth column reports the significant level of the tax rate, referral group, probability of being audited and tax knowledge with the tax knowledge has the significance level of 0.016. Notes: Significant at p< 5%.*

This study also indicates the perception of tax rate, influence of referent group and probability of being audited are not significant to tax compliance. These results provide new evidence that taxpayers who have the perception of tax rate, high influence from family members and friends and a high probability of being audited would tend to discourage tax compliance. Therefore, hypothesis 1, 2 and 3 were rejected.

With regard to the probability of being audited, the finding is consistent with the result reported by Young (1994), which showed a high probability of audit would potentially decrease the compliance of taxpayers. Therefore, since a high probability of being audited less encourages tax compliance, the tax authority should not only increase the number of audit samples but also the firmness of sanction in tax audits.

In relation to the influence of the referent group, this result is not quite significant to improve the compliance level of taxpayers. This contradicts previous results shown by Clotfelter (1983), Hasseldine et al. (1994) and Palil et.al. The opposite result may due to the character of retailers which rather indifferent to the existing taxation.

With regard to the perception of tax rated, this finding indicates the result is not significantly correlated to tax compliance. In line with Kirchler (2007:114) that tax rate is an important factor in determining tax compliance behavior although the exact impact is still unclear and debatable.

In summary, it could be concluded that tax knowledge has the significant correlation to tax compliance of taxpayers as long as fairness of the tax system occurs. It seems, however, that tax compliance is solely based on tax knowledge, the probability of being audited, the perception of tax rate, and the referent group. Besides the tax knowledge in social level is the determining factor to tax compliance.

Although this study has indicated the tax knowledge is the only significant factor explaining tax compliance, there are several limitations to this study. First, this study excludes a number of independent variables such as financial constraints and the perception of Taxpayers over government spending that may be important in determining tax compliance. Second, the number of samples only covered individual retail and does not include corporate retailers.

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# INTERNET FINANCIAL REPORTING AND DISCLOSURE PRACTICES OF PUBLICLY TRADED CORPORATIONS: EVIDENCE FROM SRI LANKA

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**ABSTRACT**

*Although Internet Financial Reporting (IFR) has become standard practice rather than the exception in most Western countries, empirical evidence of the phenomenon is only just emerging in developing economies. This paper examines the use of the internet as a medium for the voluntary communication of financial information by publicly traded companies on the Colombo Stock Exchange (CSE) in Sri Lanka. The 244 companies listed on the CSE were analysed by its 20 industry sectors. The results indicate that IFR is still at a nascent stage in Sri Lanka and there are considerable opportunities and challenges for all stakeholder parties. While 59 percent of companies maintain websites, only 63 of these (about 43%) use their websites to communicate financial information. This indicates that companies in Sri Lanka do not fully garner the benefits of engaging in IFR. However, the online annual reports of the latter IFR companies were found to be highly accessible, with 87 percent of the websites enabling users to locate information in three mouse clicks or less. Industry affiliation is found to be an important factor in determining the intensity of IFR practices as revealed by the statistically significant Pearson Chi-square test and the Likelihood ratio. It was also found that although a variety of reporting formats are utilised for engaging in IFR, PDF is the most widespread format with 92 percent of CSE listed companies using this medium.*

**JEL:** M4

**KEYWORDS:** Internet Financial Reporting, Voluntary Disclosure, Electronic Financial Reporting, Financial Report Accessibility, Corporate Communication, Sri Lanka

## INTRODUCTION

In recent years, the internet has been recognised as an efficient and effective tool for corporate communication. With this recognition, companies in emerging economies seem to increasingly appreciate the significant advantages of corporate communication though the internet as suggested by the growth of companies engaging in internet financial reporting (IFR) (Nurunnabi and Hossain, 2012). In this study, we investigate and report on the extent and nature of the voluntary use of the internet for the communication of financial information by companies listed on the Colombo Stock Exchange (CSE) in Sri Lanka. Internet financial reporting has become the norm, rather than the exception, in most Western countries (Gowthrope, 2004; Chatterjee and Hawkes, 2008). However, the same cannot be said of companies in emerging economies such as Sri Lanka, where empirical evidence of the phenomenon is only just emerging. Until recently, hard copies (paper) have been the primary means for communicating financial information with shareholders and other corporate stakeholders. Technological advancement has made the internet a useful, timely and cost-effective tool for the communication of this information to stakeholders.

Asian economies in general are steadily moving toward middle and upper-middle income status with significant growth in their economies. These include emerging economies such as Sri Lanka, Thailand,

Malaysia, Philippines, and Vietnam (Lozach et al., 2014). However despite advances in many areas of human endeavour, questions persist as to whether corporate organisations in Asia with some of the world's highest rates of economic growth are fully availing themselves of the opportunity provided by the internet to communicate financial information to their stakeholders. There is little doubt about the benefits of the internet as a tool for the communication of financial information, even as it raises a variety of challenging issues. This paper is an important step in further gauging the extent to which such benefits are being captured in the South Asian region. Given the increasing importance of IFR, and the lack of a comprehensive body of knowledge on IFR practices in South Asia, this paper provides an important contribution to filling the gap in our knowledge of the subject. This is of particular importance in a time when there is so much interest in investment opportunities in the region (Zhang, 2013; Lozach et al., 2014).

To gauge the extent of IFR practices of listed companies in Sri Lanka, the 244 companies listed on the Colombo Stock Exchange website were first identified. The companies' website links where available were then accessed. Otherwise, a search was made for the company website using search engines. If a particular company's website seems to be unavailable from the former two approaches, the respective companies were contacted by telephone and requested to provide their website address, if any. About 59 percent (145 out of 244) of CSE-listed companies were found to maintain websites; of these, however, only 63 (about 43%) engage in IFR, in a variety of formats, types and volume. From the results of this study, it is possible to preliminarily conclude that IFR is still at an embryonic stage in Sri Lanka, providing considerable opportunities and challenges for all stakeholder parties in corporate reporting. This study highlights some of these issues as well as a number of areas for further study. The remainder of the paper is structured as follows. A review of the relevant literature is provided in the next section. This is followed by a discussion of the data and research methodology. The results are presented next, with the final section concluding the paper.

## LITERATURE REVIEW

A number of academic studies have presented evidence of IFR practices in various countries – see, for example, Craven and Marston (1999); Deller *et al.* (1999); Gowthorpe and Amat (1999); Hedlin (1999); Lymer *et al.* (1999); Pirchegger and Wagenhofer (1999); Trites (1999); Marston (2003); Oyelere *et al.* (2003); Fisher *et al.* (2004); Gowthorpe (2004); Marston and Polei (2004); Xiao *et al.* (2004); Khadaroo (2005); Laswad *et al.* (2005); Smith and Peppard (2005) and Chan and Wickramasinghe (2006); Oyelere *et al* (2007); Boesso and Kumar (2007); Mohamed *et al* (2009); Nurunnabi and Hossain (2012); Oyelere and Kuruppu (2012); Uyar (2012). They indicate the increasing use of the Internet for corporate dissemination including providing annual reports on the Internet, and that the extent and sophistication of IFR practices varies across countries. Most of the studies in this area have covered IFR practices in Western countries and are on specific IFR issues such as form and content of IFR in these particular countries. Chatterjee and.Hawkes (2008), for example, focused on the specific issue of accessibility of website information, while Debreceny (2002) specifically focused on the importance of the disclosure environment as a driver for IFR presentation and content. Fisher et al. (2004) examined the key audit implications of IFR, while Gowthorpe (2004) examined the communication issues relating to IFR practices of smaller listed companies. This paper provides evidence of the uptake of internet financial reporting in Sri Lanka, which is one of the fastest growing economies in Asia (World Bank, 2014). The extent of IFR practices in Sri Lanka has not been studied before.

The Internet is a convenient and efficient medium of communication for organizations. One of the main benefits of IFR is the potential large savings in the cost of production and distribution of financial information. The Internet allows companies to reach a much wider category and variety of stakeholders at relatively lower costs, with reduction in incidental requests from non-shareholder financial statement users (Allam and Lymer, 2002; Khadaroo, 2005; Boesso and Kumar, 2007). The literature also documents a number of other benefits that may accrue from IFR (Baker and Wallage, 2000; Laswad *et al*, 2000; Ettredge

*et al.*, 2001; Debreceny, *et al.*, 2002; Wagenhofer, 2003; Jones and Xiao, 2004; Boritz and No, 2005; Boesso and Kumar, 2007; Nurunnabi and Hossain, 2010)). These include more equitable information dissemination among stakeholders as a result of improved accessibility to information. With IFR, users can choose to access information that meets their specific needs as the Internet allows non-sequential access to information through the use of hyperlinks and interactive search facilities. IFR provides an opportunity for going beyond what is available in hard copy corporate financial statements to communicate additional financial information to users, possibly on real-time and interactive bases (McCafferty, 1995; Louwers *et al.*, 1996; Green and Spaul, 1997; Trites, 1999; FASB, 2000; Ettredge *et al.*, 2002; Wickramasinghe, 2006); Oyelere and Kuruppu (2012). For instance, companies are now able to extend financial disclosure beyond the reproduction of a hard copy annual report and improve on the timeliness, scope and interactivity of financial reporting. This can be attained by incorporating financial information provided on the web with multimedia, such as sound, animation and video that can be used to potentially increase the understanding and clarity of the provided information (Louwers *et al.*, 1996; Ravlic, 2000; Wickramasinghe and Lichenstein, 2006). In addition, companies could further extend their financial information disclosure ability through the use of electronic communication languages such as extensible business reporting language (XBRL) (Sheridan and Drew, 2012). These developments have a great potential impact on users (Wallman, 1997; Green and Spaul, 1997; Gowthrope and Flynn, 2001; Sheridan and Drew, 2012).

A number of IFR-related issues and challenges have, however, been noted in the literature. There is the potential that the dividing line between current financial information used by management and historical audited financial information made available to public users of financial information could be erased by online, real-time reporting (Green and Spaul, 1997; Hodge, 2001; Oyelere et al, 2003; Sortur, 2006), with auditors being possibly required to provide opinion on such hitherto internal financial information (Trites and Sheehy, 1997; Lymer and Debreceny, 2003; Khadaroo, 2005; Sortur, 2006). Also, if IFR is installed as the only mode for communicating financial information, there is the likelihood that access to such information will be restricted to only those who possess computer equipment and skills. Hence, to ensure equity in financial information dissemination, it will be necessary to ensure that the information being reported through corporate websites are already provided previously or simultaneously through other channels of financial information disclosure (McCafferty, 1995). This could however be viewed as unnecessary duplication and may result in even greater costs.

Additional issues and challenges for IFR include possible errors in the extraction or re-keying process, which may affect the reliability and integrity of the financial information; the use of corporate websites for many diverse purposes, which may make the location of financial information difficult; the acceptability of Internet financial reports as an alternative to hard copy annual reports among users of corporate financial information; and the fact that Generally Accepted Accounting Practice (GAAP) does not consider some of the implications of IFR, such as the possibility that published financial disclosures can be changed with relative ease post publishing; (Laswad *et al.*, 2000; Mohammed *et al.,* 2009).

Perhaps by far the greatest challenge faced in the IFR environment is that of ensuring the security and integrity of the financial information published on corporate websites. Apart from possible errors in the publishing process, materials published on the web are susceptible to all manners of security risks (Bawaneh, 2014; PwC, 2014). There is a real risk that critical decisions could be made by users of financial information based on inaccurate financial information gleaned from corporate websites. The extent to which these issues are dealt with is likely to determine the long-term usefulness of the Internet as a medium of corporate financial information dissemination.

More recently, some studies have provided evidence on the factors motivating the IFR behaviour of companies around the world. Given the voluntary nature of IFR, these studies sought to establish the reason why companies engage in IFR and the extent of such engagement. The majority of these studies have found corporate size to be a major factor, with IFR likely to provide greater economies of scale cost savings for

larger firms (Ashbaugh *et al.*, 1999; Craven and Marston, 1999; Pirchegger and Wagenhofer, 1999; Debreceny *et al.*, 2002; Ettredge *et al.*, 2002; Oyelere *et al.*, 2003; Trabelsi *et al*, 2008; Nurunnabi and Hossain, 2010; Uyar, 2012). Evidence on other variables examined is largely inconclusive.

Less evidence however exists on the nature and extent of this important practice in South Asia (Sortur, 2006; Gakhar, 2012). Studies have only recently started to emerge on corporate IFR practices in the region. For instance, Davey and Homkajon (2004) report that Thai firms used IFR as a complement to their traditional paper based annual reports and that the content and quality of IFR practices varied widely. These findings are similar to Almilia (2009) in Indonesia, where IFR reporting practices of companies were also found to be largely inconsistent, with some companies only choosing to provide partial financial statements while others provided full annual reports. While Khan and Ismail (2012) reports that companies listed on the Main Board of Bursa Malaysia have a high incidence of IFR, other Asian countries such as Bangladesh show a much lesser uptake of IFR by listed companies. Nurunnabi and Hossain (2012) show that only 33 percent of listed companies in Bangladesh engage in IFR.

The only exception to these studies showing a low incidence of IFR in the region is India. Chatterjee and Hawkes (2008) find a high incidence of online corporate reporting by the top 30 Indian companies, as ranked by market capitalization. In a later study that examined the online reporting practices of the top 500 companies listed on the Bombay Stock Exchange in India, it was found that over 98% percent of these companies had links to the annual reports (Shukla and Gekara, 2010). The high incidence of IFR among the largest Indian companies is not surprising given the presence they have in the economy and the investment these companies make in promoting themselves online. It would be more interesting to examine the IFR practices of the smaller listed Indian companies, which comprise the majority of listed firms by number. Consequently, these studies in general reveals that IFR in the region is still in a nascent stage, with a few companies being advanced in their use of the Internet as an additional channel for voluntary communication with stakeholders. Many of the companies in the region, except for the largest listed companies in India are either yet to take up the practice, or are not taking full advantage of the flexibility and communication options offered by the Internet. As shown above, evidence of IFR practices in the region are still relatively sparse. It is predicted that IFR is likely to overtake hard-copy print form of financial information disclosure in the near future. It is therefore surprising that evidence on the variety of issues associated with this form of financial disclosure is currently not being deposited in the public domain. Such evidence will depend on the outcome of studies such as is being undertaken in the current study.

## DATA AND METHODOLOGY

The main objective of this study is to explore and document the nature and extent of voluntary IFR practices of publicly traded companies on the Colombo Stock Exchange (CSE) in Sri Lanka, which is one of the oldest stock exchanges in Asia. It achieves this objective by examining the nature and extent of financial reporting practices on the websites of companies listed on the CSE. The research methodology employed to accomplish this objective is consistent with and parallels those used by Laswad et al., (2005), Oyelere et al., (2007) and Oyelere and Kuruppu (2012). A list of all publicly listed companies was first compiled from the website of the CSE for year 2013. This resulted in examining the data related to 244 companies across its 20 industry categories. Subsequently, information about whether these companies have a website or not were determined at the first instance via the hyperlinks on the CSE website. Where there were no links to the corporate websites on the CSE website, an internet search was made for the company using the www.google.com search engine. For companies that did not produce websites from the latter two approaches, the individual companies were contacted by telephone to determine if they have a website and to ascertain their address. A similar sequence for identifying corporate websites was used by Fisher et al (2004) and Oyelere and Kuruppu (2012).

For companies with corporate websites, we proceeded on to the next stage of the data collection process by investigating the types of information provided on these websites. Specifically, data about five categories of information were obtained relating to the entities' industrial classification, information disclosed about corporate history, products and services, financial information and the publishing format in which the latter information was disclosed. This data collection approach is similar to the one used in Laswad et al (2005), and Oyelere and Kuruppu (2012). The collected data were then analysed using the cross-tabulation procedure and the statistical significance of the association between the variables was further examined by both the Pearson Chi-square test and the Likelihood ratio test. The results of the analysis are presented and discussed in the following section.

## RESULTS

Table 1 shows the industry classification of the 244 companies on the CSE by industry.The majority of the listed companies of 58.6 per cent are from six of the twenty industry sectors represented in the CSE. They comprise of: Banks, Finance & Insurance (16.4%), Manufacturing (13.5%), Hotels & Travels (13.1%), Beverage & Tobacco (8.2%), Land & Property (8.2%), and Plantations (7.4%).

Table 1: Industry Classification of Sri Lankan Listed Companies

| Industry | Frequency | Percent |
|---|---|---|
| Banking, Finance & Insurance | 40 | 16.4 |
| Beverage & Tobacco | 20 | 8.2 |
| Chemicals & Pharmaceuticals | 9 | 3.7 |
| Construction & Engineering | 3 | 1.2 |
| Diversified Holdings | 11 | 4.5 |
| Footwear & Textiles | 4 | 1.6 |
| Healthcare | 5 | 2.0 |
| Hotels & Travels | 32 | 13.1 |
| Info Technology | 2 | 0.8 |
| Investment Trusts | 9 | 3.7 |
| Land and Property | 20 | 8.2 |
| Manufacturing | 33 | 13.5 |
| Motors | 6 | 2.5 |
| Oil Palms | 5 | 2.0 |
| Plantations | 18 | 7.4 |
| Power and Energy | 4 | 1.6 |
| Services | 7 | 2.9 |
| Stores Supplies | 5 | 2 |
| Telecommunications | 2 | 0.8 |
| Trading | 9 | 3.7 |
| Total | 244 | 100.0 |

*Table 1 presents the frequency and percentage of companies in each of the twenty industry codes of the Colombo Stock Exchange.*

Only a relatively small number of CSE listed companies maintain corporate websites as shown in Table 2. Approximately 59.4 percent of companies have corporate websites, while the remaining 40.6 percent do not. This reveals a fairly low level of corporate web presence when compared to developed Western economies such as the US, Australia and New Zealand, where corporate web presence is significantly higher (Pervan, 2006; Chatterjee and Hawkes, 2008; Khan and Ismail, 2012) The web presence of Sri Lankan listed companies also lags behind those of other emerging economies in the Middle East (Oyelere and Kuruppu, 2012). For instance, 87 per cent of UAE listed companies maintain websites. Sri Lankan companies' web presence also lags behind other Asian countries where IFR has been studied. Specifically, Malaysia, China and India reports significantly higher web presence and higher adaption rates for IFR compared to Sri Lanka (Chatterjee and Hawkes, 2008; Shukla and Gekara, 2010; Khan and Ismail, 2012). The web presence of Sri Lankan companies compare favourably with Bangladesh, which has a 29 percent presence (Nurunnabi and Hossain, 2012). This initial finding indicates that companies in Sri Lanka have not fully garnered the benefits of internet financial reporting, as IFR cannot be implemented without a corporate website. Only four of the twenty industry sectors lead in the uptake of corporate websites in Sri Lanka, by having a 100 per cent adoption rate. These sectors include Construction and Engineering, Information Technology, Power and Energy and the Telecommunications sector.

Table 2: Companies With and Without Websites by Industry

| **Panel A:** | | | | | |
|---|---|---|---|---|---|
| **Industry** | **Without Website** | | **With Website** | | |
| | **Frequency** | **Percentage** | **Frequency** | **Percentage** | **Total** |
| Banking, Finance & Insurance | 6 | 15.0% | 34 | 85.0% | 40 |
| Beverage & Tobacco | 10 | 50.0% | 10 | 50.0% | 20 |
| Chemicals & Pharmaceuticals | 5 | 55.6% | 4 | 44.4% | 9 |
| Construction & Engineering | 0 | 0% | 3 | 100.0% | 3 |
| Diversified Holdings | 2 | 18.2% | 9 | 81.8% | 11 |
| Footwear & Textiles | 2 | 50.0% | 2 | 50.0% | 4 |
| Healthcare | 2 | 40.0% | 3 | 60.0% | 5 |
| Hotels & Travels | 19 | 59.4% | 13 | 40.6% | 32 |
| Info Technology | 0 | 0% | 2 | 100% | 2 |
| Investment Trusts | 5 | 55.6% | 4 | 44.4% | 9 |
| Land and Property | 16 | 80.0% | 4 | 20.0% | 20 |
| Manufacturing | 10 | 30.3% | 23 | 69.7% | 33 |
| Motors | 1 | 16.7% | 5 | 83.3% | 6 |
| Oil Palms | 5 | 100% | 0 | 100% | 5 |
| Plantations | 7 | 38.9% | 11 | 61.1% | 18 |
| Power and Energy | 0 | 100% | 4 | 100% | 4 |
| Services | 4 | 57.1% | 3 | 42.9% | 7 |
| Stores Supplies | 3 | 60% | 2 | 40% | 5 |
| Telecommunications | 0 | 100% | 2 | 100% | 2 |
| Trading | 2 | 22.2% | 7 | 77.58% | 9 |
| Total | 99 | 40.6% | 145 | 59.4% | 244 |
| | 17 | 12.9% | 115 | 87.1% | 132 |

| **Panel B: Chi-Square Tests for Companies with and without Websites by Industry** | | | |
|---|---|---|---|
| **Test** | **Value** | **df** | **Asymptotic Significance (2-sided)** |
| Pearson Chi-Square | 53.841 | 19 | 0.000*** |
| Likelihood ratio | 61.532 | 19 | 0.000*** |

*Table 2: Panel A presents web presence by industry, while Panel B examines whether corporate web presence is influenced by industry. Significance at 1% or better, 5% or better and 10% or better are denoted by ***, **, and * respectively.*

Industry sectors with moderate to high web presence include companies in Banks, Finance and Insurance (85%); Diversified holdings (82%); Trading (78%); Manufacturing (70%) and Plantations (61%). The web presence of Sri Lankan companies in the financial services sector is lower than in other emerging economies such as the UAE (Oyelere et al., 2008; Oyelere and Kuruppu (2012). At the other end of the spectrum, companies in Hotels and Travels (41%), Investment trusts (44%), Land and property (20%), Oil palms (0%), Services (43%) and Store supplies (40%) have a relatively lower incidence of corporate websites.

Given the wide variation corporate web presence, it is interesting to determine if the presence of corporate websites is influenced by the particular industrial sector a company is operating in. A number of previous studies have examined the association between industry category and disclosure levels. These studies have produced varied results, with industry being found to be a determinant of disclosure levels in some countries (Xiao *et al.,* 2004; Al-Shammari, 2007) but not in others (Smith et al., 2005; Oyelere and Kuruppu, 2012). In the current study, we find that industry category and corporate web presence has a statistically significant association. This is indicated by the statistically significant Chi-square test and the Likelihood ratio, presented in Panel *B* of Table 2. It is plausible that companies in a particular industry follow the information dissemination practices of that industry, especially if it conforms to practices of the leading corporations in the sector. However such an investigation is outside the scope of the current research.

Organisations communicate a variety of voluntary information through their corporate websites. These frequently include background information about the company, products and services offered and also information of a financial nature. Panel A of Table 3 summarizes the types of information provided by Sri Lankan listed companies, categorized by industry. Hundred and eight companies (about 74.5 percent) provide background information about themselves, while a hundred and thirteen companies (about 78 percent) provide information about their products and services. Industry sector is significantly associated with whether a firm disclose information about corporate history and information about the products and

services it offers. This is shown by the significance of the respective chi-square tests and the likelihood ratios in Panel B of Table 3. Despite companies in the majority of sectors utilising their websites to disclose information about the above mentioned aspects, companies in other sectors show a comparatively low level of utilizing corporate websites for disclosing information about corporate history and background. For instance, just 33%, 25% and 36% respectively of companies in the Construction, Land and Plantation sectors disclosed information about their corporate history or background. Companies in these industries also exhibit a lower level of disclosure about their products and services. The reason why companies in these sectors exhibit lower levels of disclosure is not clear. It is possible that companies in these industrial sectors have lesser incentives to communicate these aspects of their corporate existence to their stakeholders. It therefore implies that stakeholders in these industries will need to access multiple sources of information in order to gain full knowledge of the history, background, products and services of companies in these industries.

Table 3: Types of Information on Sri Lankan Corporate Websites

| **Panel A: Types of Online Information Provided by CSE listed Companies** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Industry** | | **Company History** | | **Products & Services** | | **Financial Information** | |
| | | **No** | **Yes** | **No** | **Yes** | **No** | **Yes** |
| Banking | Count | 2 | 32 | 0 | 34 | 5 | 29 |
| | Percentage | 5.9 | 94.1 | 0 | 100 | 14.7 | 85.3 |
| Beverage | Count | 1 | 9 | 1 | 9 | 8 | 2 |
| | Percentage | 10 | 90 | 10 | 90 | 80 | 20 |
| Chemicals | Count | 1 | 3 | 0 | 4 | 2 | 2 |
| | Percentage | 25 | 75 | 0 | 100 | 50 | 50 |
| Construction | Count | 2 | 1 | 2 | 1 | 2 | 1 |
| | Percentage | 66.7 | 33.3 | 66.7 | 33.3 | 66.7 | 33.3 |
| Div Holdings | Count | 1 | 8 | 0 | 9 | 1 | 8 |
| | Percentage | 11.1 | 88.9 | 0 | 100 | 11.1 | 88.9 |
| Footware | Count | 0 | 2 | 0 | 2 | 1 | 1 |
| | Percentage | 0 | 100 | 0 | 100 | 50 | 50 |
| Healthcare | Count | 2 | 1 | 2 | 1 | 3 | 0 |
| | Percentage | 66.7 | 33.3 | 66.7 | 33.3 | 100 | 0 |
| Hotels | Count | 3 | 10 | 3 | 10 | 11 | 2 |
| | Percentage | 23.1 | 76.9 | 23.1 | 76.9 | 84.6 | 15.4 |
| Info Tech | Count | 0 | 2 | 0 | 2 | 2 | 0 |
| | Percentage | 0 | 100 | 0 | 100 | 100 | 0 |
| Inv Trusts | Count | 0 | 4 | 0 | 4 | 3 | 1 |
| | Percentage | 0 | 100 | 0 | 100 | 75 | 25 |
| Land | Count | 3 | 1 | 3 | 1 | 3 | 1 |
| | Percentage | 75 | 25 | 75 | 25 | 75 | 25 |
| Manufact. | Count | 8 | 15 | 7 | 16 | 16 | 7 |
| | Percentage | 34.8 | 65.2 | 30.4 | 69.6 | 69.6 | 30.4 |
| Motors | Count | 0 | 5 | 0 | 5 | 5 | 0 |
| | Percentage | 0 | 100 | 0 | 100 | 100 | 0 |
| Plantations | Count | 7 | 4 | 7 | 4 | 11 | 0 |
| | Percentage | 63.6 | 36.4 | 63.6 | 36.4 | 100 | 0 |
| Power | Count | 0 | 4 | 0 | 4 | 1 | 3 |
| | Percentage | 0 | 100 | 0 | 100 | 25 | 75 |
| Services | Count | 2 | 1 | 2 | 1 | 2 | 1 |
| | Percentage | 66.7 | 33.3 | 66.7 | 33.3 | 66.7 | 33.3 |
| St. Supplies | Count | 2 | 0 | 2 | 0 | 2 | 0 |
| | Percentage | 100 | 0 | 100 | 0 | 100 | 0 |
| Telecom | Count | 0 | 2 | 0 | 2 | 0 | 2 |
| | Percentage | 0 | 100 | 0 | 100 | 0 | 100 |
| Trading | Count | 3 | 4 | 3 | 4 | 4 | 3 |
| | Percentage | 42.9 | 57.1 | 42.9 | 57.1 | 57.1 | 42.9 |
| Total | | 37 | 108 | 32 | 113 | 82 | 63 |
| Percentage of Total | | 25.5% | 74.5% | 22.1% | 77.9% | 56.6% | 43.4% |

| **Panel B: Chi-Square Tests for Types of Information on Corporate Websites by Industry** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Test | **Value** | **df** | **Sig.** | **Value** | **df** | **Sig.** | **Value** | **df** | **Sig.** |
| Pearson Chi-square | 45.262 | 18 | 0.000*** | 57.278 | 18 | 0.000*** | 63.142 | 18 | 0.000*** |
| Likelihood Ratio | 48.510 | 18 | 0.000*** | 64.305 | 18 | 0.000*** | 75.392 | 18 | 0.000*** |

*Table 3, Panel A presents the types of online information provided by CSE listed companies including financial information. Panel B depicts whether the type of information presented is influenced by the particular industry sector. Significance at 1% or better, 5% or better and 10% or better are denoted by ***, **, and * respectively.*

Although the research literature provides ample support for the benefits of engaging in IFR, CSE listed companies using their corporate websites to voluntarily disclose information of a financial nature are

considerably less. This is apparent when the respective IFR rates are compared with the information provided about corporate history and the products and services offered by the same companies. Specifically, only about 43 percent (63 out of 145) of CSE listed companies maintaining corporate websites made any voluntary financial disclosures. This indicates that the internet as a medium of financial reporting is not as widespread in Sri Lanka when compared to Western countries, where the rate of companies engaging in voluntary internet financial reporting is significantly higher (Pervan, 2006; Chatterjee and Hawkes, 2008). When the Sri Lankan data are further analysed by industrial classification in Table 3, it can be seen that the majority of the industry sectors have a poor adoption rate for IFR. Indeed, sixteen of the nineteen industry sectors having corporate websites have an adaption rate of 50% or less, with companies in Healthcare, Information Technology, Motors, Plantations and the Supplies sectors showing a 0% adoption rate.

However, we find a statistically significant association between industrial affiliation, and the likelihood of a company engaging in IFR. Sri Lankan listed companies in certain industries are more likely to take advantage of the Internet for the purpose of voluntary dissemination of financial information to stakeholders than companies in other industries. Table 3 show that companies in Banking, Diversified Holdings and the Power sectors, report higher IFRS rates of 85.3%, 88.9% and 75% respectively. The reason why the Banking sector show a higher uptake of IFR may be due to the greater regulatory oversight placed on this industry which require greater levels of disclosure due to their significance to the Sri Lankan economy. However, it is less clear why Diversified Holdings and Power also report a higher level of IFR compared to other industries as these sectors are not heavily regulated in Sri Lanka. These findings reflect the fact that most Sri Lankan listed companies do not fully appreciate the potential benefits that can be derived from engaging in IFR. This leaves the opportunity for the main stock exchange regulatory body in Sri Lanka to promote the use of IFR as a means of cost effectively and efficiency communicating corporate information with stakeholders, which is already the norm in Western countries. The statistical test of significance for the association between industry category and the type of information provided on corporate websites is presented in Panel *B* of Table 3. The significance of the Pearson Chi-square test and the Likelihood ratio show that industrial affiliation is an important factor in determining the intensity of IFR practices of listed companies in Sri Lanka.

Companies choosing to engage in IFR can publish financial information in various formats, ranging from PDF to Flash based reports. Publishing formats such as PDF enables interested parties to access information from different computer operating systems. It also it enables different levels of security to be embedded into the document. The main advantage of the PDF format is that software to open and create documents in this format is widely available for free, and the document publisher knows exactly how the document will look to the reader. With other formats such as Flash, audio and video data can also be embedded into the file to present the data in a richer and interactive manner, but the format is probably not very efficient when users want to find specific content, or to copy content from within the flash file for later analysis. The CSE listed companies in this study disclosing financial information were analysed to ascertain the publication format of their financial reports. Table 4 presents these results.

It can be seen that PDF is the most commonly used publishing format for financial information on corporate websites, with 92 percent of companies using it. This was followed by the HTML format, which was used by 6 percent of companies. A graphic (JPG) image of financial data was used by 1.6 percent of the companies. It is interesting to note that none of the CSE listed companies except for the Banking sector utilised multiple reporting formats to report financial information. These findings are also consistent with the reporting formats in other emerging economies such as Oman and the UAE, where PDF is the most commonly used reporting format followed by the HTML format (Oyelere *et al.,* 2008; Oyelere and Kuruppu, 2012). Other reporting formats such as Flash and MS Word was not utilised by Sri Lankan companies, although these formats have been utilised albeit less frequently in other countries (Oyelere and Kuruppu, 2012). Both the Pearson Chi-square test and the Likelihood ratio in Panel B of Table 4 show that there is no statistically significant association between industry affiliation and the preference for one type

of reporting format over another. Irrespective of industry classification, the PDF format remains the most common reporting format for financial information by CSE listed companies, which is also consistent with the widespread use of this format for IFR in other countries (Oyelere and Kuruppu, 2012).

Table 4: Reporting Format of Financial Information

| **Panel A: Reporting Format(s) Used by IFR Corporations** | | | | | |
|---|---|---|---|---|---|
| **Industry** | | **PDF only** | **HTML only** | **Graphic (JPG)** | **Total** |
| Banking | Count | 24 | 4 | 1 | 29 |
| | Percentage | 82.8 | 13.8 | 3.4 | 100 |
| Beverage | Count | 5 | 0 | 0 | 5 |
| | Percentage | 100 | 0 | 0 | 100 |
| Chemicals | Count | 2 | 0 | 0 | 2 |
| | Percentage | 100 | 0 | 0 | 100 |
| Construction | Count | 1 | 0 | 0 | 1 |
| | Percentage | 100 | 0 | 0 | 100 |
| Diversified Hold | Count | 8 | 0 | 0 | 8 |
| | Percentage | 100 | 0 | 0 | 100 |
| Footware | Count | 1 | 0 | 0 | 1 |
| | Percentage | 100 | 0 | 0 | 100 |
| Hotels | Count | 2 | 0 | 0 | 2 |
| | Percentage | 100 | 0 | 0 | 100 |
| Investment Trusts | Count | 1 | 0 | 0 | 1 |
| | Percentage | 100 | 0 | 0 | 100 |
| Land | Count | 1 | 0 | 0 | 1 |
| | Percentage | 100 | 0 | 0 | 100 |
| Manufacturing | Count | 7 | 0 | 0 | 7 |
| | Percentage | 100 | 0 | 0 | 100 |
| Power | Count | 3 | 0 | 0 | 3 |
| | Percentage | 100 | 0 | 0 | 100 |
| Services | Count | 1 | 0 | 0 | 1 |
| | Percentage | 100 | 0 | 0 | 100 |
| Telecom | Count | 2 | 0 | 0 | 2 |
| | Percentage | 100 | 0 | 0 | 100 |
| Trading | Count | 3 | 0 | 0 | 3 |
| | Percentage | 100 | 0 | 0 | 100 |
| *Total* | | 58 | 4 | 1 | 63 |
| | | 92.1 | 6.3 | 1.6 | 100 |
| **Panel B: Chi-Square Tests for Reporting Format of Financial Information** | | | | | |
| **Test** | | **Value** | | **df** | **Asymp. Sig.** |
| Pearson Chi-square | | 6.367 | | 26 | 1.000 |
| Likelihood Ratio | | 8.267 | | 26 | 1.000 |

*Table 4: Panel A shows the reporting format(s) used by IFR corporations. Panel B examines whether industry classification influences the reporting format. Significance at 1% or better, 5% or better and 10% or better are denoted by ***, **, and * respectively.*

Finally this study examined the ease at which financial information published by CSE listed companies are accessible to interested parties. A number of authors have advocated the so called "Three-click rule". The Three-click rule is based on the premise that information on websites should be accessible to users in ideally no more than three mouse clicks, as more clicks increases users' frustration with accessing data and some users' may not look further for information (Zeldman, 2001; CPRB, 2008). Although this rule is essentially a rule of thumb, it makes good sense in designing websites to provide information quickly without concealing information under layers of hyperlinks (Zeldman, 2001; Porter, 2003; Chatterjee and Hawkes, 2008; CPRB, 2008). Panels A and B of Table 5 show the data pertaining to mouse clicks.

It can be seen that IFR information are directly linked on the main webpage in 6% of the companies, while just two mouse clicks are required to access the data in 32% of the companies. Just under half of the IFR companies require three mouse clicks to access the financial data. This shows that the majority of users (of 87%) are able to locate the IFR data on the corporate websites in three mouse clicks or less, with a mean of 2.71 clicks. This finding is positive in terms of making the financial information readily available to users. However, 9.5 percent of the companies required four clicks and 3% percent of the companies required five mouse clicks. No CSE listed company required more than five clicks to access the published financial information. It would be interesting to investigate whether these rates differ in other countries. However no research exists to the best of our knowledge that examines the 'clickability' aspect from an IFR point of view.

Table 5: Clicks Required to Access Financial Information

| **Panel A : Ease of Access to the Financial Reports of IFR Companies** | | | | |
|---|---|---|---|---|
| | | **Frequency** | **Percent** | **Cum. Percent** |
| Mouse Clicks | 1 | 4 | 6.3 | 6.3 |
| | 2 | 20 | 31.7 | 38.1 |
| | 3 | 31 | 49.2 | 87.3 |
| | 4 | 6 | 9.5 | 96.8 |
| | 5 | 2 | 3.2 | 100.0 |
| | Total | 63 | 100.0 | |
| **Panel B: Descriptive Statistics For 'Clickability'** | | | | |
| **N** | **Mean** | **Median** | **Minimum** | **Maximum** |
| 63 | 2.71 | 3.00 | 1 | 5 |

*Table 5 indicates the ease of access to the financial reports of IFR companies. This is measured by the number of mouse clicks required to access the financial report.*

## CONCLUDING COMMENTS

This research examined the extent to which CSE listed companies in Sri Lanka use the internet to voluntarily communicate financial information. This was done by analysing the reporting practices of the 244 companies listed on the CSE. We found that the majority of these companies of 59.4% maintain corporate websites, while the remaining 40.6 percent do not. However the former rate is a significantly lower one when compared to Western countries, and indeed to other emerging economies such as the UAE, Oman and India. The results show that Sri Lankan listed companies have not taken full advantage of the benefits of disclosing financial information through the internet. This is despite the high IT literacy in Sri Lanka, which is routinely exported to countries in the Middle East and elsewhere. A possible reason for this phenomenon that has led to the relatively lower IFR adaption rate may be related to the regulatory authorities in the country and also the management of companies not fully appreciating the benefits of reporting financial information using the internet.

An analysis of the types of information presented on CSE listed corporate websites show that most companies primarily utilize websites to communicate background information about the company, and the products and services they offer. Indeed, 75 percent of companies communicated information about the corporate background through their websites, and 78 percent of the companies disseminated information about the products and services provided. However, only 57 percent of the companies used corporate websites to disseminate financial information, with the remaining 43 percent of the companies not utilizing corporate websites for financial reporting purposes. It therefore appears that IFR is not a primary motive for the establishment and utilisation of corporate websites in Sri Lanka. This indicates that the general relationship between whether a company maintains corporate websites and whether it actually engages in IFR is not a clear or strong one in Sri Lanka. Interestingly, we found a statistically significant association between industrial affiliation, and the likelihood of a company engaging in IFR. Companies in certain industries such as in Banking are more likely to take advantage of the Internet for the purpose of voluntary dissemination of financial information to stakeholders than companies in other industries.

Despite the fact that most Sri Lankan listed companies maintain corporate websites, this study found that, in the main, they exhibit a relatively lower level of IFR compared to Western countries. It was found that although about 59 percent of CSE listed companies maintain websites, only 43 percent of these used their websites to communicate financial information with their stakeholders. In many Western countries, the uptake reaches 100 percent (Fisher *et al.,* 2004; Pervan, 2006; Chatterjee and Hawkes, 2008). Perhaps companies in the Sri Lanka do not fully recognise the significant benefits that could accrue to them by engaging in IFR. It is also possible that listed companies in Sri Lanka do not see an incremental benefit in engaging in IFR, given that the financial information of most companies is already published through the website of the CSE (http://www.cse.lk). This should, however, not be the case, as companies should endeavour to take control and responsibility for the information communicated to their stakeholders. In countries such as the UK, USA, Malaysia and Singapore, companies actively engage in IFR despite the fact

the some of this financial information may be already available on the websites of the respective stock exchange websites. In these countries, IFR is already the norm among companies rather than the exception.

Management's perception about the cost of engaging in IFR and the technological expertise needed may be other issues limiting the widespread implementation of IFR among companies. However, apart from initial set-up costs, which are relatively minor, the ongoing long-term costs of operating and maintaining corporate websites for IFR purposes are minimal. Initial set-up costs could include computers systems and equipment acquisition, system design and implementation costs, including consultancy charges, general and application control costs of the system, and ICT space and infrastructural requirements. While initial set-up costs could be substantial, they are usually relatively minor in comparison to other corporate costs. The benefits to be derived from IFR in the current age of globalisation and endemic market inter-linkages are likely to far outweigh the pecuniary costs. The current level of technological expertise and development in Sri Lanka is more than adequate for the creation, operation and maintenance of corporate websites for IFR purposes. As the Internet gains greater popularity, it is likely that emerging economies such as Sri Lanka will witness an upsurge in IFR over the next five years and regulators and other governmental agencies, as well as other stakeholder groups will need to be prepared for this development.

The above findings have to be seen from the context of the benefits accruing to companies engaging in IFR. They have the potential to substantially reduce the costs associated with traditional paper based financial reports, and be able to make information available to interested parties on a timely basis. The production and distribution of hardcopy financial statements could be cumbersome and costly, particularly where a company's stakeholders are widely dispersed. Globalisation has made this even more complicated for companies, as stakeholders could be located in several countries around the world. The advent of the internet makes it possible for a company to disseminate financial information to most of its stakeholders in a cost-efficient and timely manner.

Indeed, in light of this, the OECD in its Principles of Corporate Governance recognizes that the Internet and other information technologies provide the opportunity for improving information dissemination (OECD, 2004). More recently, Report Leadership (2007) which is a multi-stakeholder group comprising the Chartered Institute of Management Accountants, PriceWaterhouseCoopers and Radley Yeldar has put forward a number of proposals for effective corporate reporting on the internet. Other authorities, such as the Canadian Institute of Chartered Accountants have also recognised the internet as a key medium for communicating financial information (CPRB, 2008). In this environment where both regulators and the accounting profession perceive the potential benefits of internet financial reporting, regulatory agencies in the Sri Lanka cannot afford to postpone the great advantages offered by IFR by letting companies adapt IFR at their own pace and in an unstructured setting as to what information should be disclosed and when, in what format and also how to differentiate between audited and unaudited information. Regulators in Sri Lanka need to take a more proactive role in promoting the benefits of IFR, whilst at the same time addressing the regulatory framework that may be necessary for the more widespread but structured adoption of IFR.

In this regard, guidance provided by IFAC (2002) and Report Leadership (2007) may be used by regulators in Sri Lanka as a foundation for addressing issues such as (a) the types of information to appear on a corporate website and the format in which that information will be provided; (b) how to differentiate between audited and non-audited information, as well as information that is subject to securities and market regulation and information that is meant to supplement what is required; (c) the use of hyperlinks; (d) the frequency of changes to or updates to financial information and (e) control issues such as approval of financial information that ultimately appears on a corporate website and the security infrastructure. Given the increasing use of the internet as a medium of communicating financial information, more research is needed to better understand the dynamics of why some firms engage in voluntary internet financial reporting whilst others do not, and the costs of engaging in the same. Additional research should also help

end users differentiate between audited and non-audited financial information on corporate websites, and the responsibilities of key groups, including external auditors, as even more entities increasingly rely on the internet to communicate financial information. Studies may further investigate the key determinants of IFR practices in the region, and the extent to which XBRL can facilitate the adaption of online financial reporting.

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# ENHANCED RELATIONSHIP PARTICIPATION INCENTIVES FOR (DUTCH) MULTINATIONAL ORGANIZATIONS

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**ABSTRACT**

*This paper deals with enhanced relationship participation in an international context. The purpose of this study has been to offer insight into the essentials for implementing a Tax Control Framework (TCF) and identify organizations' incentives to participate in an enhanced relationship. First, the common guidelines for implementing a TCF are described. Second, we investigate organizations' incentives to participate in an enhanced relationship on the basis of a survey conducted among the tax directors of the largest Dutch multinational organizations quoted on the Dutch stock exchange. Our analysis identifies two important incentives for organizations to participate in an enhanced relationship.*

**JEL:** H20, H25, K34

**KEYWORDS**: Controlling, Corporate Governance, Enhanced Relationship, Tax, OECD, Internal Control

## INTRODUCTION

As a result of an initiative of the Organisation for Economic Co-operation and Development (OECD), both tax compliance and tax accounting have undergone radical changes in most countries worldwide. Communiqués published by the OECD stimulate the implementation of risk-concentrated tax regulations aimed at "enhanced relationships". The objective is that companies organize their tax structures in a risk-oriented manner (OECD, 2010) in compliance with the overall internal control systems emphasized after the Enron failure. These tax structures should increase tax authorities' insight into companies' largest tax risks. Following the OECD initiative, countries all over the world have integrated enhanced relationship policies in their national regulations (Bakker and Kloosterhof, 2010). In 2005, the Dutch tax authorities introduced a version of the OECD's tax-based regulation called "horizontal monitoring".

As from the year 2007, horizontal monitoring has been the official policy in the Netherlands (Belastingdienst, 2008; Van Daelen and Van der Elst, 2010). Horizontal monitoring has changed the relation between the tax authorities and businesses. On the one hand, the tax authority has to stimulate an environment of trust and close cooperation. In return, the companies are expected to contact the tax authorities whenever there is ambiguity about their tax obligations. The advantage of this approach for the tax authorities is a better allocation of resources, as they obtain more information about which organizations and/or parts of organizations run the highest perceived risks. The advantage for companies is a less intensive tax investigation by the tax authorities at the year's end (Kemp and Verbakel, 2010). To achieve these benefits, however, the Dutch tax authorities need more insight into the risks of companies. To this end, they have obliged companies who want to participate in the "horizontal monitoring" system to set up a Tax Control Framework (TCF).For the ease of reading in this paper, the term "enhanced relationship" is used when the Dutch form is referred to.

However, although the OECD offers some general guidance, support in implementing a TCF is limited in the Dutch context; the Dutch Tax Authorities have no mandatory framework. However, there are well known models available used in controlling process other than those in the tax domain, for example COSO and COBIT. A TCF model which fully covers the requirements of the OECD, COSO, COBIT and the Dutch Tax Authorities is the Tax Management Maturity Model (T3M). This model categorizes tax risks into six specific tax-related subjects: Business & (Tax) environment, Business operations, Tax Operations, Tax Risk Management, Monitoring/Testing and Tax assurance. These broad areas are again divided into more specific factors which form the fundaments in judging a subject.

This paper focuses on the criteria for implementing a TCF and the main incentives of companies to participate in an enhanced relationship. First, TCF guidance will be explained. As a TCF has to cover the requirements as formulated by the relevant authorities, it is important to understand these rules. The question that will be answered is therefore: *What guidance should be offered by the OECD, Dutch tax authorities, COSO and COBIT in implementing a TCF?* Second, focusing on the practitioners in Dutch multinational firms, we will seek the answer to the following research question: *What are the main incentives for multinationals to participate in an enhanced relationship?* Here we will specifically emphasize three possible incentives: the effect on the business environment, new rules and policies in the near future, and the Netherlands as a tax haven. Below, we will continue with the literature review of this paper. The scientific relevance and the TCF guidance from the OECD, the Dutch tax authorities and the controlling models will be discussed. Finally, we present our analysis and the results of a survey conducted among Dutch multinationals quoted on the largest Dutch stock exchanges.

## LITERATURE REVIEW

In this chapter we have performed a literature review. This review presents the state-of-the-art of the scientific status. Although enhanced relationships form a regular topic of discussion in the scientific literature (e.g. Simonis, 2008; De Groot and Van de Enden, 2010), the (international) guidelines for a TCF are only rarely discussed. However, tax controlling - and the TCF as part of it - is an important element in organizations' corporate governance. So, research on the implementation of a TCF is beneficial for both the controlling literature and the practical field. The benefits from a theoretical perspective have been discussed by Simone et al. (2013) and Hoyng, et al. (2009). In this paper a payoff model has been created to determine when there is added value from an enhanced relationship for both the taxpayer and the tax authority. This paper concludes that it's important for an enhanced relationship to be beneficial that the tax authority is able to identify uncertain positions with sufficient high probability and the cost of the program is sufficiently low. Companies strive to minimize the sum of expected taxes and tax-compliance costs. There is also (limited) literature from a government perspective: it was the OECD which introduced the concept of the enhanced relationship.

After years of discussion among the member states and numerous drafts, 35 economies signed the Seoul declaration in 2006 (OECD, 2006): a commitment to cooperation aimed at establishing efficient and international-orientated tax regulations. In 2008 this commitment was followed by the Cape Town Communiqué (OECD, 2008). Representatives of 45 economies discussed the application of risk management to taxes. More insight into companies' risk management practices would enable the tax authorities to allocate their resources more effectively to (parts of) organizations with higher risks (and less effective risk management) or companies without sufficient control over their taxes. In the years after Cape Town, the OECD provided the participating economies with some informative reports containing high-level input as regards the enhanced relationship approach (OECD, 2010; 2011; 2012). The main principles described in these reports included four aspects: real-time contacts with companies about tax issues, a focus on tax-related processes, making tax compliance easier, and stimulating a good cooperation between the tax authorities and the companies and their stakeholders.

The Dutch tax authorities obliged companies to implement a TCF for their enhanced relationship tasks. However, they offered only limited guidance in how to interpret this framework (Belastingdienst, 2008). The documentation published by the Dutch tax authorities mainly stated that practitioners had to develop a TCF on the basis of their own knowledge and experience. As a possible tool for the implementation of their TCF it was advised to use COSO. COSO (Committee of Sponsoring Organizations of the Treadway Commission) is a model developed to support companies in designing their internal control frameworks (COSO, 2004). It consists of four company goals, linked to four organizational levels and eight risk and control components. Besides the model, additional information is offered about best practices. For example, the COSO reports anticipate new challenges which companies are likely to encounter in the near future (e.g. COSO, 2009). So, applying the COSO model also requires the usage of the reports.

Information technology (IT) has a great impact on the functioning of most organizations. The processes concerning IT (IT governance) should therefore be sufficiently in control. A model which supports this purpose is COBIT (Control Objectives for Information and related Technology). It was developed by ISACA (Information Systems Audit and Control Association). COBIT consists of five fundamental principles: meeting stakeholder needs, covering the enterprise end-to-end, using a single integrated framework, enabling a holistic approach, and separating governance from management. In a practical context, COBIT has translated these principles into the four key areas 'plan', 'build', 'run, 'monitor', and 'governance'. Combining the guidelines described above from the OECD, The Dutch Tax Authorities, COSO and COBIT results in a framework for implementing a TCF. This framework can be easily implemented on an international level, as each country can combine its own national guidelines with guidelines set by the OECD, COSO and COBIT. As mentioned before an instrument, which fulfils the (international) TCF requirements, is the Tax Management Maturity Model (Colon, 2012).

The first important contribution of this paper to the literature is therefore that it has created a universal guideline for the development of a TCF. Above we presented the relevant guidelines applicable that should be combined for implementing a TCF. The Dutch focus of this paper could be easily changed to another context by replacing the Dutch tax law factors by those of another country.

The second important contribution of this study is the emphasis on practitioners. As an enhanced relationship cannot be entirely explained by theoretical concepts, practitioners are needed to contribute to the development of enhanced relationship policies. In this way problems will be recognized which are not detected when focusing solely on theories. To our knowledge there is only a limited amount of research on enhanced relationships which also includes practitioners (e.g. Freedman et al., 2009). The survey results as presented in this paper show some of the companies' incentives for participating in an enhanced relationship. As the willingness of businesses to participate in such a relationship is essential for the success of the policies in this area, this paper has particularly concentrated on gaining insights into how to further implement enhanced relationship laws and regulations worldwide.

Data Gathering and Methodology

Next, we will present the findings of a survey conducted among the tax directors of a number of large multinationals. The results were further analyzed to find the most relevant incentives as indicated by these multinationals to participate in an enhanced relationship. But first we will rationalize the hypotheses which formed the input for our survey. After that, the analysis and results will be discussed. Research on enhanced relationships based on surveys is very scarce. To our knowledge the only relevant survey in this respect is that of Freedman et al. (2009). This study examines the UK practice. Because of the limited amount of relevant research on enhanced relationships, our hypotheses have partly been framed by (indirectly) related literature and common sense. As a result, it was not possible to add more relevant literature, since we did not consider work which was only remotely related as having any additional value.

Organizational goals are not only limited to the interests of the shareholders. Businesses have to consider the interests of all stakeholders. Corporate social responsibility (CSR) has an important impact on modern societies. Jones et al. (2009) define this concept as follows: the integration of social, economic, ethical and environmental considerations into the organizational strategy and operational activities. Transparency about taxes also forms part of this Corporate Social Responsibility. Societies differ in their strictness of CSR. These differences could be an incentive for organizations to settle in a specific country. Important here is the country's perception of CSR: does the society perceive the organization to perform its activities in line with the CSR guidelines? As regards taxes this issue could entail an in-control statement as part of the TCF (De Groot & Van der Enden, 2010). However, what is also important in this context is the company's perception. If companies consider an enhanced relationship as positive for their business, one could expect them to be more positive toward the inclusion of additional instructions in their TCFs.

*Hypothesis 1:* The perception that an enhanced relationship creates a better business environment is positively related to an organization's willingness to participate in such a relationship. Not every company employs the same level of CSR. Some are more prepared to be corporately and socially responsible than other organizations. Currently, companies are not obligated to engage in an enhanced relationship. However, if they expect the introduction of new compliance rules in the near future, they will have to think about how these regulations are going to impact their activities. This process of deliberation may render companies more willing to participate in an enhanced relationship immediately.

*Hypothesis 2:* The expectation of the introduction on an international level of an enhanced relationship policy in the near future (five years) is positively related to the willingness of businesses to participate in such a relationship. Some companies present themselves as being concerned with society as part of their CSR policy. If companies are expected to be more society-concerned regardless of the reputational effects and possible higher profits, they are also assumed to be more willing to pay taxes. Following this rationale, companies which believe that nowadays it has become too easy to avoid taxes should also be more willing to engage in an enhanced relationship, as it will enhance their reputation and make it better compared to that of relatively less paying companies.

*Hypothesis* 3: The perception of the Netherlands as a tax haven is positively related to the willingness of businesses to participate in an enhanced relationship. The assumed relations were tested by a survey held among a selection of companies. This selection was limited to Dutch multinationals quoted on the largest Dutch stock exchanges (AEX and Midkap). No difference was made in terms of industry or quotation on either only the Dutch or also on other stock exchanges. The Dutch multinationals quoted on the Dutch stock exchanges formed the most relevant sample, as the Dutch tax authorities generally initially focus on the these companies before imposing measures (such as enhanced relationships) on other businesses. The multinationals therefore had more experience with enhanced relationships than other companies in the Netherlands. For the companies selected, a survey was sent to these organizations' tax directors. The survey was conducted during the period March - May 2012. The operational data were extracted from the respective annual reports (2012). The sample contained 20 companies. We use two types of variables:

*Dependent variable*; The measure for the willingness to participate in an enhanced relationship was indicated by a value as given by the tax directors, scaled from one to five (one was no willingness and five the ultimate willingness).

*Independent variables*: The effect on the business environment was determined by questioning the respondents whether they considered an enhanced relationship to have a negative effect (one), no effect (two), or a positive effect (three) on the business environment. Whether the enhanced relationship was expected to be imposed upon companies in the near future (five years) was measured on a five point scale (with five indicating that an enhanced relationship was highly expected). The respondents were questioned to consider this obligation in an international context. The perception of the Netherlands as a tax haven has

been EU-centered. The tax directors were therefore asked to consider the Dutch taxes in comparison to those in the other EU member states. Scale number 'one' indicated low tax avoidance and 'five' that the Netherlands was considered as a tax haven. In addition, a control variable was put into the sample to exclude the possible impact of other factors on the hypotheses. As larger companies have a larger impact on their environment, they are exposed to more pressure to practice CSR. This possible impact had to be excluded. This is why we introduced a control variable for the number of employees in a company. The number of employees was measured by a logarithm of the actual amount of staff members.

The following method of analysis is used in this paper. The relations among the first three independent variables and the dependent variable (conform the hypothesizes formulated above) were tested by linear regression using SPSS. Therefore will test the formulas below (where Y represents the willingness to participate in an enhanced relationship):

$$Y1 = \alpha + \beta(Business\ environment) + \beta(number\ of\ employees)$$

$$Y2 = \alpha + \beta(short\ term) + \beta(number\ of\ employees)$$

$$Y3 = \alpha + \beta(tax\ haven) + \beta(number\ of\ employees)$$

## RESULTS

The descriptive statistics (table 1) are not indicative of an exceptional sample. The willingness to engage in an enhanced relationship (4.100 out of 5) is high in the sample. Moreover, an enhanced relationship is considered to be positive for the business environment (2.421 out of 3). However, the expectation of an enhanced relationship obligation in the near future and the perception of the Netherlands as a tax haven yielded neither positive nor negative scores (3.000 and 2.500 out of 5 respectively). The number of employees in our sample can be considered as high (9.548 after using a logarithm) compared to other research, for example Gallo & Christensen (2011), with an average of 2.28. As our sample included the largest Dutch multinationals, this was, however, to be expected.

Table 1: Descriptive Statistics for the Dependent and Independent Variables

| | **Mean** | ***Min*** | ***Max*** | ***Std. Dev.*** |
|---|---|---|---|---|
| Dependent variable<br>Willingness | 4.100 | 3 | 5 | 0.788 |
| Business environment | 2.421 | 1 | 3 | 0.838 |
| Short term | 3.000 | 1 | 4 | 1.076 |
| Tax haven | 2.500 | 1 | 4 | 0.889 |
| Number of employees | 9.548 | 5.74 | 12.47 | 1.661 |

*This table shows descriptive statistics. The first column shows the sample mean. The second and third column show respectively the lowest and highest number in the sample. The fourth column shows the standard deviation from the sample.*

The Pearson correlation (table 2) shows only one notable outcome. Tax directors who believe that an enhanced relationship is positive for the business environment also expect this measure to become obligatory in the near future. This finding is significant at the 1% level and has a coefficient of 0.712 indicating that these variables are much related. So, based on this finding it can logically be assumed that if one of these variables would (or not) be related to the willingness to participate in an enhanced relationship, the other would also (or neither). No other correlations were found in the sample.

*Hypothesis 1:* suggested a relation between the perceived (positive) effect on the business environment and the willingness to participate in an enhanced relationship. The regression results (table 3) present a significant relation on the 1% level (coefficient of 0.729). Based on the sample the perceived effect on the

business environment is a major incentive for companies to participate in an enhanced relationship which is also indicated by the high R-squared. With a result of 0.704 the business environment variable explains for a large part the companies' incentive to participate in an enhanced relationship. Hypothesis 1 is therefore accepted.

Table 2: Pearson Correlation with Independent Variables

| *Variabel* | **Business Environment** | **Short Term** | **Tax Haven** | **Employees** |
|---|---|---|---|---|
| Business environment | 1.000 | | | |
| Short term | 0.712*** | 1.000 | | |
| Tax haven | 0.131 | 0.275 | 1.000 | |
| Number of employees | 0.154 | 0.047 | 0.061 | 1.000 |

*This table shows Pearson correlation. The first column shows the correlations of the business environment variable with the other independent variables. The second column shows the correlations of the short term variable with the other variables. The third column shows the correlation of the tax haven correlation with the other variables. The fourth column shows the correlation of the employees' factor with the other factors. *** Indicate significance at the 1% level, (two-way).*

*Hypothesis 2:* suggested a relationship between the obligation to participate in an enhanced relationship in the near future (less than five years) and the willingness to participate in such a relationship. The regression results show a significant relation on the 5% level (coefficient 0.336). Based on the sample, the perception that the enhanced relationship is going to be imposed by law in the near future is an incentive for companies to participate in a relationship. The R-squared indicates that this variable also explains for a large part the companies' incentive to participate in an enhanced relationship. Hypotheses 2 is therefore accepted.

*Hypothesis 3:* assumed a relationship between the perception of the Netherlands as a tax haven and the willingness to participate in an enhanced relationship. The regression results, however, show no significant relation in this respect. Based on the sample, the perception of the Netherlands as a tax haven appears not to be an incentive for companies to participate in an enhanced relationship. Hypotheses 3 is therefore rejected.

Table 3: Enhanced Relationship Willingness Regression Results

| | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** |
|---|---|---|---|---|---|
| Constant | 2.813 | 1.395 | 1.483 | 2.260 | 0.701 |
| | (1.039) | (0.645) | (0.833) | (1.109) | (0.556) |
| Number of employees | 0.135 * | 0.093 * | 0.120 * | 0.127 | 0.106 * |
| | (0.107) | (0.063) | (0.079) | (0.106) | (0.051) |
| Business environment **(H1)** | -- | 0.729 *** | -- | -- | 0.435 *** |
| | | (0.128) | | | (0.146) |
| Short term **(H2)** | -- | -- | 0.336 ** | -- | 0.293 ** |
| | | | (0.117) | | (0.115) |
| Tax haven **(H3)** | -- | -- | -- | 0.252 | 0.152 |
| | | | | (0.197) | (0.096) |
| R-squared | 0.081 | 0.704 | 0.530 | 0.161 | 0.837 |
| Adjusted R-squared | 0.030 | 0.667 | 0.474 | 0.063 | 0.791 |
| F-value | 1.580 | 18.997 *** | 9.569 *** | 1.635 | 18.029 *** |

*This table shows regression results. The first column shows the regression results for the control variable number of employees. The second column shows regression results for the business environment independent variable. The third column shows regression results for the short term independent variable. The fourth column shows regression results for the tax haven independent variable. The fifth column shows the regression results for all the variables together. The dependent variable in every regression is enhanced relationship willingness. ***, **, * Coefficient is statistical significant at respectively 1%, 5%, and 10% level.*

## DISCUSSION

The aim of this paper is to extend our limited knowledge about enhanced relationships. Specifically, the focus in this paper is on the identification of incentives for companies for enhanced relationship

participation. The first part of this paper discussed the existing guidelines for implementing a TCF. In this context, both international and Dutch recommendations for an enhanced relationship were mentioned. It was argued that in implementing a TCF the Dutch guidelines could be replaced by those of other countries without any difficulty. In this respect, an important contribution to the literature has been made by providing an overview of relevant literature which can be universally used. The guidelines mentioned in this overview form the basis for implementing a TCF on a worldwide level.

The second part of this paper presented the analysis of a survey held among 20 tax directors of Dutch multinationals quoted on the largest Dutch stock exchanges. Based on the limited relevant scientific literature available and commons sense we proposed three hypotheses which are tested. The data from the survey with tax directors were used to test the hypotheses. We identified two important incentives which influence the willingness of companies to participate in an enhanced relationship: 1) a (perceived) positive impact on the business environment and 2) the conception that the enhanced relationship measure is going to be imposed in the near future (less than five years). The sample showed that 1) was the most important independent variable for enhanced relationship participation in our sample and considering the high statistical values observed 1) is of great importance for companies to participate in an enhanced relationship in general. These findings are very important for both tax authorities and scholars.

Our results provide the tax authorities with fundaments for a tax policy which stimulates large multinationals to participate in the enhanced relationship approach. We also know, however, that future regulations should focus more on the benefits for the companies in this context. We therefore first recommend a financial incentive for companies, for example, lower compliance costs. This is in accordance with Simone et al. (2013) which concluded that companies strive to minimize the sum of expected taxes and tax-compliance costs. Second, we suggest that a reputation incentive is put in place, for example, by obliging the state's disclosure of the TCF in the annual report. Also for scholars our findings are important: rather than using a purely theoretical approach to the question why an enhanced relationship is or is not a success, our empirical study has shed some light on the actual perceptions/motivations of the businesses in the practical field as regards the perceived relationship policy. In addition, we identified no relation between the willingness to participate in an enhanced relationship and the perception of The Netherlands as a tax haven. This might implicate that companies consider more tax transparency not necessary. Further research could focus on the relation between tax transparency and an enhanced relationship.

Besides, this paper has some limitations, which may give rise to further scientific research. First, as our study was restricted to the Dutch framework, further investigation could address other countries or map out the differences among their national guidelines to further develop an international TCF. Second, this study only focused on a limited amount of incentives influencing the willingness of companies to participate in an enhanced relationship. Follow up research may concentrate on additional incentives. Furthermore, future studies may start from a different context, for example smaller organizations or organizations in different countries. These investigations may produce different outcomes. Third, the sample in this paper was small (2o), which means that one or more items could have had a relatively large impact on the outcome of the study, thereby undermining its generalization. Further research could be focused on overcoming this limitation.

## CONCLUDING COMMENTS

This study presented relevant guidelines for implementing a TCF with an emphasis on the Netherlands. In addition, a practical approach was used to identify companies' main incentives to participate in an enhanced relationship. We conducted a survey among the tax directors of large companies quoted on the Dutch stock exchange. Via linear regression we analyzed the data gathered during this investigation. Two of our hypotheses were confirmed: "The perception that an enhanced relationship creates a better business environment is positively related to an organization's willingness to participate in such a relationship" and

"The expectation of the introduction on an international level of an enhanced relationship policy in the near future (five years) is positively related to the willingness of businesses to participate in such a relationship". The third hypothesis was rejected: "The perception of the Netherlands as a tax haven is positively related to the willingness of businesses to participate in an enhanced relationship". In conclusion, we identified two important incentives for companies to participate in an enhanced relationship: the perception that an enhanced relationship has a positive effect on the business environment and the expectation that an enhanced relationship policy will be introduced in the near future.

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# MEASURING INCOME INEQUALITY: AN APPLICATION OF THE POPULATION DYNAMIC THEIL'S ENTROPY

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**ABSTRACT**

*In this paper we use the index we call Population Dynamic Theil's Entropy to analyze as the income inequality varies on time. The index may consider both the inequality among the classes in which we assign the individuals and the inequality within each class. This inequality measure working in a dynamic way allows to forecast inequality in time. Besides it may capture not only changes in the wealth but also changes in the population composition. The earned results are relevant for adopting a social and economic policy of wealth distribution. We fulfilled the model with statistics from the Organization for Economic Co-operation and Development and we applied it to Mexico, Portugal and Spain. We picked up economic data about population, means and medians of the equivalised net income for the three countries. The data refer to years from 2004 to 2011.*

**JEL:** E64, E27

**KEYWORDS:** Income Distribution**,** Population Dynamic Theil's Entropy, Markov Chains

## INTRODUCTION

A recent approach in economics proposes measuring the income inequality through dynamic indices instead of the classic static indices, like those by Gini, Herfindahl-Hirschman and Theil. Theil (1967) introduced the Theil's entropy, since then most used in scientific papers. It holds the sum of the products of the shares of the total income of each individual (stood for by $y_i$) multiplied by the logarithm of $Ny_i$ , *being* $N$ the number of the agents in the economic system. The range of values is between 0 and $ln(N)$. The index takes the value 0 when the wealth is equidistributed among the agents and the value $ln(N)$ when one agent holds all the wealth.

This paper belongs to this recent line of research aiming at measuring the income inequality in a dynamic way in the whole population of some countries. We considered countries with comparable socio-cultural life styles and religion but with different rates of change of Gross Domestic Product (GDP), like for example Mexico, Portugal and Spain. For this investigation we adopted the Population Dynamic Theil's Entropy (PDTE) because it may capture not only the changes in wealth but also changes in population composition. Therefore it is possible to justify changes in the index when the population structure varies over time. The results show such analysis to be useful to decision makers to carry out policies of economic integration.

Many papers make use of Markov chain modeling to describe how income changes (Quah, 1993, 1994, 1995, Dardanoni, 1995), also some papers consider Bayesian estimations of persistent income inequality (Nishino, Kakamu and Oga, 2012, Kakamu and Fukushige, 2009). Some applications related to the income inequality indices underline the importance of this research field. They include 1.) Influences of political regimes and financial reforms (Kemp-Benedict, 2011, Baland, Dagnelie and Rey, 2007), 2.) Relevance of

geographical reasons (Banerjee, Mookherjee, Munshi and Rey, 2001, Chaudhuri, Ghatak, Guha, Mookherjee and Rey, 2007), 3.) Impact of immigration on the concentration of wealth distribution (D'Amico, Di Biase and Manca, 2011) and 4.) Impact of the fiscal system on wealth redistribution in the population (D'Amico, Di Biase and Manca, 2013). This paper is a follow-up study to the adjustment of the Dynamic Theil's Entropy to forecast the income inequality on a given time horizon in the whole population of some countries. Thanks to decomposing Theil's Entropy into three addenda (D'Amico, Di Biase and Manca, 2014) the paper makes a careful examination of the wealth distribution in Mexico, Portugal and Spain. The rest of the paper is organized as follows. In the next session the paper provides a review of the relevant literature. The following section briefly describes the stochastic model. Next we explain data and method to calculate the PDTE. Next section presents the results of the application to the three countries. The paper closes with some conclusions and further research suggestions.

## LITERATURE REVIEW

Many authors successfully applied econometric indices to measuring the income inequality in a given economic system (Tirole, 1988, Sen, 1993, Dagum 1990, Davies and Hoy, 1995, Bajo and Salas, 2002, Campano and Salvatotre, 2006, Shahrestani and Bidabad, 2010). Scientific community recognized Theil's Entropy thanks to its properties. They include the scale independence, the invariance to replication of population, the Pigou-Dalton principle of transfers (Dalton, 1929, Athanasopoulos and Vahid, 2003), the strong principle of transfers and the additive decomposability (Cowell, 1995, Kakamu and Fukushige, 2009). In the nineties Quah (1993, 1994, 1995) and Dardanoni (1995) used Markov chains to modeling income dynamics. Nevertheless these random processes may not consider properly the randomness in the waiting times in the states. Indeed, in the authors opinion, the lapsed time in a class of income, influences the probability distributions of the income. If an agent is in the rich class for a long time, has a likelihood to remain rich that is different from that of an individual who is rich by few time.

Bickenbach and Bode (2003) outlined the inadequacy of the Markov chain model. In a recent paper D'Amico and Di Biase (2010) proposed the use of a semi-Markov process to calculate inequality indices in a dynamic way. So they surmounted the inadequacies previously highlighted. The generalization of the indices considered a population that changes overtime according to a semi-Markov process and by considering the production of each economic agent as a reward process. This approach can capture not only changes in the wealth but also changes in the population structure and justifies changes in the inequality when the population composition varies overtime.

Nishino, Kakamu and Oga (2012) proposed a different approach based on Bayesian estimation of persistent income inequality by Lognormal stochastic volatility model. A paper by D'Amico, Di Biase and Manca (2011) performed a model simulation and calculated some dynamic indices for different economic scenarios. In particular the paper considered the Herfindahl-Hirschman index (Hirschman, 1964), the Gini index (Gini, 1912) and the Theil's entropy (Theil, 1967). Also D'Amico, Di Biase and Manca (2011) showed how the model could be useful for analyzing the immigration effects about the inequality of wealth distribution in the economy. They paid a particular attention to the effects caused by a population simulation increase of 10%. Since the direct application of the model to real case studies needs microdata about income evolution of agents which are often unavailable, D'Amico, Di Biase and Manca (2012) proposed a method to use the model by knowing only averages and medians of the incomes. The method considered Markov chains to model income evolution.

D'Amico, Di Biase and Manca (2013) proved the force of suitable fiscal policies as fundamental tool of macroeconomic planning to spread out wealth and decrease income inequality. The paper recovered the gross income distributions by using the individual income tax rates in some European countries. The paper by D'Amico, Di Biase and Manca (2014b) proposed a decomposition of the Population Dynamic Theil's Entropy (PDTE). This decomposition into three addenda let us evaluating the inequality on the whole

considered population and not only among the classes of agents as done in D'Amico and Di Biase (2010). The PDTE relax the hypothesis of homogeneity among the agents belonging to the same income class. The more correct hypothesis of diversity fulfill more correct applications.

The Model

We can represent the classic Theil's Entropy (TE) as follows:

$$TE = \frac{1}{N}\sum_{i=1}^{N}\frac{y_i}{\bar{y}}\left(log\frac{y_i}{\bar{y}}\right), \quad (1)$$

where $\bar{y}$ is the average income in the population and $y_i$ is the income of the *i*-th agent.
If we allocate all agents in $K$ classes$E = \{C_1, C_2, \dots, C_K\}$, we can represent the TE by using the decomposability property, see D'Amico, Di Biase and Manca (2014b)

$$TE = \sum_{g=1}^{K} a_{C_g} TE\left(y_{C_g}; n_{C_g}\right) + \sum_{g=1}^{K} a_{C_g} \log K a_{C_g} + \sum_{g=1}^{K} a_{C_g} \log\frac{N}{K n_{C_g}} \quad (2)$$

where

$$a_{C_j} = \frac{n_{C_j} y_{C_j}}{\sum_{g=1}^{K} n_{C_g} y_{C_g}}, \quad (3)$$

$n_{C_g}$ is the number of agents of the class $C_g, y_{C_g}$ is the average per capita income of class $C_g$ and $TE(y_{C_g};\ n_{C_g})$ is the Theil's Entropy of class $C_g$.

Now if we assume the shares of income $a_{C_g}$ to be random, then (2) becomes the Dynamic Theil's Entropy on the whole Population (PDTE):

$$PDTE(t; N) = \sum_{g=1}^{K} a_{C_g}\left(\underline{n}(t)\right) TE\left(y_{C_g}; n_{C_g}(t)\right) + \sum_{g=1}^{K} a_{C_g}\left(\underline{n}(t)\right) \log K a_{C_g}\left(\underline{n}(t)\right) + \sum_{g=1}^{K} a_{C_g}\left(\underline{n}(t)\right) \log\frac{N}{K n_{C_g}(t)}. \quad (4)$$

In calculate formula (4) we supposed the agents can leave the early class and enter a new income class according to a discrete time Markov chain with transition probability matrix **P** whose element $p_{ij}$ denotes the likelihood that an agent, now assigned in $C_i$, will enter $C_j$. Notice the second addendum of (4) coincides with the Dynamic Theil's Entropy (DTE), as defined in D'Amico and Di Biase (2010). As remarked before it measures the income inequality among the classes after standardizing the population. We may summarize the entire process by computing the first order moment addendum by addendum as proved in D'Amico, Di Biase and Manca (2014b). It is worth noticing the variability of each income $y_{C_g}$ can be more properly considered when we treat the vector $\underline{y}(t) = \left(y_{C_1}, y_{C_2}, \dots, y_{C_K}\right)$ as random. We could address this major complexity by using Markov (or semi-Markov) reward processes as done for computing the Dynamic Herfindahl-Hirschman index in D'Amico, Di Biase and Manca (2014a).

## DATA AND METHODOLOGY

We used the Organization for Economic Co-operation and Development (OECD) Income Distribution Database (http://stats.oecd.org) and we picked up data about population, means and medians of the equivalised net income for Mexico, Portugal and Spain. Data refer to years from 2004 to 2011. We motivate

the choice of the countries since they represent countries with comparable socio-cultural life styles and religion but with different rates of change of GDP. We dictate the choice of the time interval by practicable considerations on data availability. We report the input data in Table 1.

Table 1: Population and Net Income Evolution for Spain, Portugal and Mexico

| | SPAIN | | | PORTUGAL | | | MEXICO | | |
|---|---|---|---|---|---|---|---|---|---|
| **Years** | **Population** | **Mean** | **Median** | **Population** | **Mean** | **Median** | **Population** | **Mean** | **Median** |
| 2004 | 42,873,973 | 13,292 | 11,530 | 10,529,255 | 10,593 | 8,154 | 102,988,791 | 45,286 | 30,147 |
| 2005 | 43,586,854 | 14,188 | 12,600 | 10,569,592 | 10,684 | 8,306 | **104,661,644** | **48,298** | **32,293** |
| 2006 | 44,339,161 | 15,243 | 13,442 | 10,599,095 | 11,109 | 8,573 | **106,334,496** | **51,309** | **34,439** |
| 2007 | 45,109,464 | 16,434 | 14,647 | 10,617,575 | 11,508 | 9,219 | **108,007,349** | **54,321** | **36,585** |
| 2008 | 45,607,945 | 16,793 | 14,979 | 10,627,250 | 11,609 | 9,232 | 109,680,201 | 57,333 | 38,731 |
| 2009 | 45,757,233 | 16,592 | 14,685 | 10,637,713 | 11,728 | 9,595 | **111,140,392** | **56,769** | **38,866** |
| 2010 | 45,900,276 | 15,993 | 14,000 | 10,636,979 | 11,610 | 9,357 | 112,600,583 | 56,205 | 39,001 |
| 2011 | 46,354,779 | 15,503 | 13,356 | 10,541,840 | 11,190 | 9,232 | **114,942,506** | **58,780** | **40,215** |

*This Table shows Population, Means and Medians of the equivalised net income for the considered countries picked up from web site http://stats.oecd.org. We expressed the incomes of Spain and Portugal in Euros whereas that of Mexico in Pesetas. We approximated all data to the units. The numbers in bold characters represent the results of a linear interpolation for missing data.*

First we recovered the income distributions by assuming that they follow a Lognormal distribution function, theory well supported by the Offices for National Statistics of the considered countries. Known means and medians we recovered the parameters reported in Table 2.

Table 2: Parameters of the Lognormal Distributions

| **COUNTRIES** | $\mu$ | $\Sigma$ |
|---|---|---|
| Spain | 9.35271 | 0.53331 |
| Portugal | 9.00626 | 0.723443 |
| Mexico | 10.3138 | 0.902123 |

*This Table shows the values of the parameters of the Lognormal distributions for the considered countries: the mean* $\mu$ *and the standard deviation* $\sigma$.

After that we built the states of the Markov Chain model by assigning each agent in one of the states according to the following rules as suggested by Quah (1996) 1.) If an economic agent has less than a quarter of the country's average per capita income, then we assign it in the poorest class $C_1$, 2.) If the agent has an income between a quarter and one half of the country's average per capita income, then we assign it in the class $C_2$, 3.) If the agent has an income between one half and the country's average per capita income, then we assign it in the class $C_3$, 4.) If the agent has an income between the country's average per capita income and its double, then we assign it in the class $C_4$ and 5.) If the agent has an income more than the double of the country's average per capita income, then we assign it in the richest class $C_5$. Next we calculated the income of classes $C_k, k \in \{1,2,3,4,5\}$ by the complete income distribution of its agents as the conditional expectation of the income distributions got just before, given the income is in class $C_k$.

## RESULTS AND DISCUSSION

In Table 3 we reported the income of the classes got for each country.

Table 3: The Income of the Classes

| Classes | Spain | Portugal | Mexico |
|---|---|---|---|
| $C_1$ | 2,910 | 2,092 | 7,931 |
| $C_2$ | 5,456 | 4,062 | 16,740 |
| $C_3$ | 9,769 | 7,560 | 31,885 |
| $C_4$ | 17,197 | 14,046 | 60,752 |
| $C_5$ | 31,351 | 26,362 | 116,197 |

*This Table shows the income of the classes got for each country. We expressed the incomes of classes of the Spain and Portugal in Euros whereas that of Mexico in Pesetas. We estimated all incomes to the units.*

Next by iterating the procedure from the year 2004 to the year 2011 we got the evolution of the population outline in time. We report these results in Table 4, Table 5 and Table 6 for Spain, Portugal and Mexico respectively.

Table 4: Evolution of Population in Spain

| CLASSES | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|---|---|
| $C_1$ | 421,469 | 198,914 | 256,094 | 172,937 | 167,399 | 225,478 | 324,572 | 502,848 |
| $C_2$ | 6,043,493 | 4,911,702 | 5,271,368 | 4,721,828 | 4,678,613 | 5,087,413 | 5,628,350 | 6,336,233 |
| $C_3$ | 19,479,480 | 20,452,423 | 20,153,642 | 20,606,729 | 20,641,534 | 20,307,553 | 19,847,939 | 19,210,153 |
| $C_4$ | 14,415,746 | 15,260,098 | 14,996,083 | 15,398,417 | 15,429,819 | 15,131,490 | 14,730,527 | 14,188,847 |
| $C_5$ | 2,513,785 | 2,050,836 | 2,196,785 | 1,974,062 | 1,956,608 | 2,122,040 | 2,342,585 | 2,635,893 |

*This Table shows the population changing in Spain from 2004 to 2011 subdivided for each of the income classes, that is for the five states of the Markov chain model.*

Table 5: Evolution of Population in Portugal

| CLASSES | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|---|---|
| $C_1$ | 632,068 | 578,382 | 618,188 | 423,126 | 459,897 | 322,896 | 393,524 | 285,497 |
| $C_2$ | 2,268,253 | 2,232,602 | 2,259,457 | 2,099,101 | 2,135,620 | 1,978,153 | 2,066,947 | 1,922,551 |
| $C_3$ | 3,851,247 | 3,913,325 | 3,866,978 | 4,115,755 | 4,064,133 | 4,272,429 | 4,159,371 | 4,338,662 |
| $C_4$ | 2,793,797 | 2,841,580 | 2,805,887 | 2,998,841 | 2,958,513 | 3,122,303 | 3,033,045 | 3,175,027 |
| $C_5$ | 983,890 | 963,365 | 978,745 | 892,432 | 911,091 | 833,475 | 876,368 | 807,517 |

*This Table shows the population changing in Portugal from 2004 to 2011 subdivided for each of the income classes, that is for the five states of the Markov chain model.*

Table 6: Evolution of Population in Mexico

| CLASSES | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|---|---|
| $C_1$ | 14,296,777 | 14,052,813 | 13,837,974 | 13,647,352 | 13,477,081 | 12,726,504 | 11,968,078 | 12,765,171 |
| $C_2$ | 24,376,718 | 24,363,089 | 24,349,336 | 24,335,724 | 24,322,415 | 24,250,171 | 24,152,897 | 24,254,455 |
| $C_3$ | 30,743,761 | 30,911,007 | 31,059,697 | 31,192,760 | 31,312,539 | 31,851,401 | 32,415,221 | 31,823,192 |
| $C_4$ | 22,104,372 | 22,228,556 | 22,339,029 | 22,437,944 | 22,527,029 | 22,928,326 | 23,349,158 | 22,907,297 |
| $C_5$ | 11,467,162 | 11,433,325 | 11,402,755 | 11,375,011 | 11,349,727 | 11,232,388 | 11,103,438 | 11,238,675 |

*This Table shows the population changing in Mexico from 2004 to 2011 subdivided for each of the income classes, that is for the five states of the Markov chain model.*

Finally we estimated the probability matrices by minimizing a $\chi$-squared type expression, as in D'Amico, Di Biase and Manca (2012). We reported the results got in Table 7, Table 8 and Table 9 for Spain, Portugal and Mexico respectively.

Table 7: One Step Transition Probability Matrix for Spain

| **CLASSES** | $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|
| $C_1$ | 0.1500 | 0.8500 | 0.0000 | 0.0000 | 0.0000 |
| $C_2$ | 0.0475 | 0.0500 | **0.9025** | 0.0000 | 0.0000 |
| $C_3$ | 0.0000 | 0.2400 | 0.6000 | 0.1600 | 0.0000 |
| $C_4$ | 0.0000 | 0.0000 | 0.2100 | 0.7000 | 0.0900 |
| $C_5$ | 0.0000 | 0.0000 | 0.0000 | 0.6500 | 0.3500 |

*This Table shows the transition probability matrix of the Markov chain model for Spain. Each number gives the probability that an agent being in this year in class i* (*represented on the rows*) *next year will get to the class j* (*represented on the columns*)*. For example the value* 0.9025 *stands for the probability that a Spanish individual, now assigned in class* $C_2$ *will enter the next allocation in class* $C_3$.

Table 8: One Step Transition Probability Matrix for Portugal

| **CLASSES** | $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|
| $C_1$ | 0.0500 | 0.9500 | 0.0000 | 0.0000 | 0.0000 |
| $C_2$ | 0.2100 | 0.3000 | 0.4900 | 0.0000 | 0.0000 |
| $C_3$ | 0.0000 | 0.2400 | 0.6000 | 0.1600 | 0.0000 |
| $C_4$ | 0.0000 | 0.0000 | 0.2100 | 0.7000 | 0.0900 |
| $C_5$ | 0.0000 | 0.0000 | 0.0000 | 0.3000 | 0.7000 |

*This Table shows the transition probability matrix of the Markov Chain model for Portugal. Each number gives the probability that an agent being in this year in class i* (*represented on the rows*) *next year will get to the class j* (*represented on the columns*)*.*

Table 9: One Step Transition Probability Matrix for Mexico

| **CLASSES** | $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|
| $C_1$ | 0.5500 | 0.4500 | 0.0000 | 0.0000 | 0.0000 |
| $C_2$ | 0.2475 | 0.4500 | 0.3025 | 0.0000 | 0.0000 |
| $C_3$ | 0.0000 | 0.2275 | 0.6500 | 0.1225 | 0.0000 |
| $C_4$ | 0.0000 | 0.0000 | 0.1600 | 0.8000 | 0.0400 |
| $C_5$ | 0.0000 | 0.0000 | 0.0000 | 0.1000 | 0.9000 |

*This Table shows the transition probability matrix of the Markov Chain model for Mexico. Each number gives the probability that an agent being in this year in class i* (*represented on the rows*) *next year will get to the class j* (*represented on the columns*)*.*

To estimate all transition probabilities needed in our model allows gaining valuable information about to evolve the population shares in each class and thus the mobility in the distribution. Indeed, assuming as initial population distribution that of the year 2004 and using the probability matrices reported in Table 7, Table 8 and Table 9, we calculated the evolution in time of the expected values of the population of Spain, Portugal and Mexico. We reported it in Table 10.

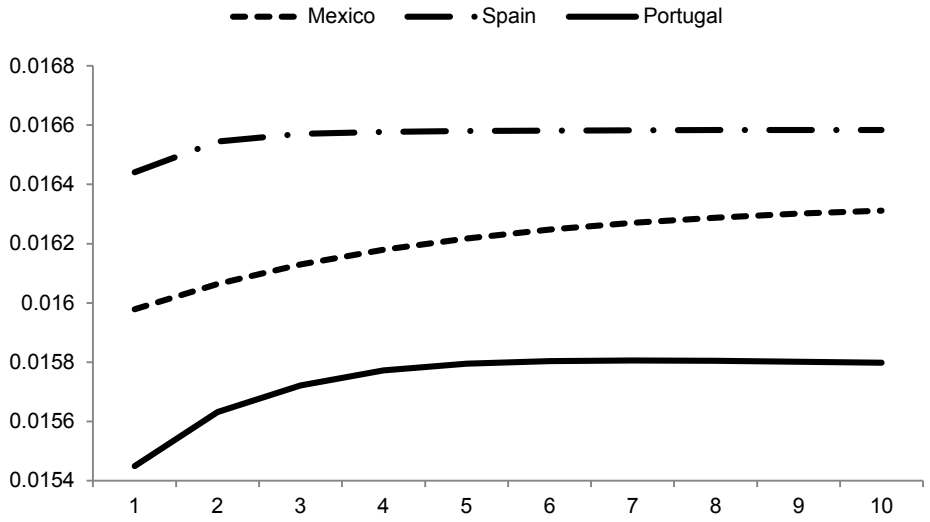
Now we can show the forecasts of the inequality measure through Theil's entropy considering the complete population, that is the PDTE. In Figures 1, 2 and 3 we report respectively to evolve the first, the second and the third addenda of PDTE for Spain, Portugal and Mexico. The graph on Figure 1 displays the expectation, on a time horizon of ten years, of the inequality within each income class for the three countries. The values are of two orders of size lower than those of the two graphs shown in Figures 2 and 3. This applies for all the considered countries. We expected the inequalities within the classes to increase in the three countries. The highest inequality within each class occurs for Spain, then for Mexico and the lowest occurs for Portugal.

Table 10: Population Expected Evolution for Spain, Portugal and Mexico

| | SPAIN | | | | | PORTUGAL | | | | | MEXICO | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Years** | $n_{C_1}$ | $n_{C_2}$ | $n_{C_3}$ | $n_{C_4}$ | $n_{C_5}$ | $n_{C_1}$ | $n_{C_2}$ | $n_{C_3}$ | $n_{C_4}$ | $n_{C_5}$ | $n_{C_1}$ | $n_{C_2}$ | $n_{C_3}$ | $n_{C_4}$ | $n_{C_5}$ |
| **2004** | 0.0421 | 0.6043 | 1.9479 | 1.4416 | 0.2514 | 0.0632 | 0.2268 | 0.3851 | 0.2794 | 0.0984 | 1.4297 | 2.4377 | 3.0744 | 2.2104 | 1.1467 |
| **2005** | 0.0350 | 0.5335 | 2.0169 | 1.4842 | 0.2177 | 0.0508 | 0.2205 | 0.4009 | 0.2867 | 0.0916 | 1.3896 | 2.4397 | 3.0894 | 2.2596 | 1.1205 |
| **2006** | 0.0306 | 0.5405 | 2.0034 | 1.5031 | 0.2098 | 0.0489 | 0.2106 | 0.4088 | 0.2930 | 0.0905 | 1.3681 | 2.4261 | 3.1077 | 2.2982 | 1.0988 |
| **2007** | 0.0303 | 0.5338 | 2.0055 | 1.5091 | 0.2087 | 0.0467 | 0.2077 | 0.4100 | 0.2980 | 0.0902 | 1.3529 | 2.4144 | 3.1216 | 2.3291 | 1.0808 |
| **2008** | 0.0299 | 0.5337 | 2.0020 | 1.5129 | 0.2089 | 0.0460 | 0.2051 | 0.4104 | 0.3014 | 0.0903 | 1.3417 | 2.4055 | 3.1320 | 2.3538 | 1.0659 |
| **2009** | 0.0298 | 0.5326 | 2.0006 | 1.5151 | 0.2093 | 0.0454 | 0.2037 | 0.4100 | 0.3037 | 0.0905 | 1.3333 | 2.3987 | 3.1401 | 2.3733 | 1.0535 |
| **2010** | 0.0298 | 0.5321 | 1.9992 | 1.5167 | 0.2096 | 0.0450 | 0.2026 | 0.4096 | 0.3052 | 0.0908 | 1.3270 | 2.3938 | 3.1464 | 2.3886 | 1.0431 |
| **2011** | 0.0297 | 0.5317 | 1.9983 | 1.5178 | 0.2099 | 0.0448 | 0.2019 | 0.4091 | 0.3064 | 0.0916 | 1.3223 | 2.3901 | 3.1515 | 2.4007 | 1.0343 |

*This Table shows the evolution in time of the expected values of the population structure for Spain, Portugal and Mexico respectively. We multiplied all numbers for* $10^7$. *We approximated all data to the fourth decimal digit.*

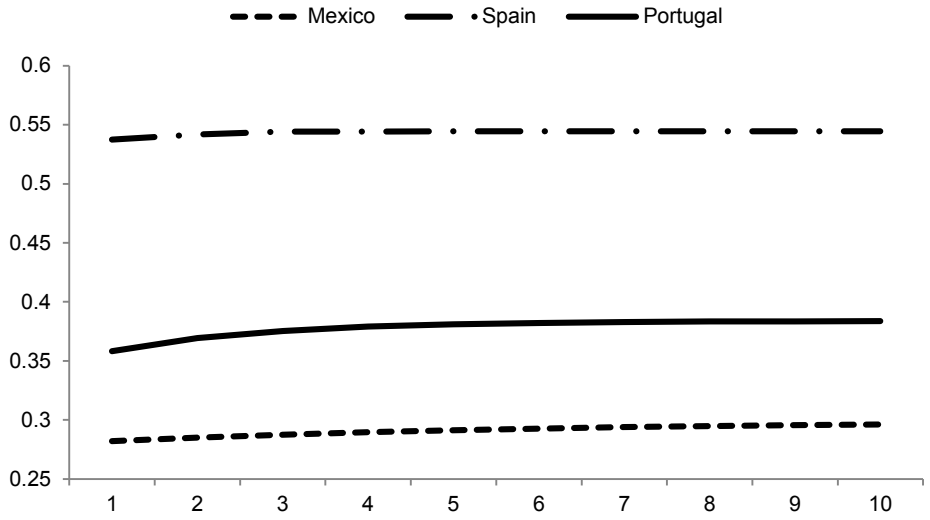
Figure 1: First Addendum of PDTE




*This figure shows the forecast on a time horizon of 10 years (x-axis) of the values (y-axis) of the first addendum of decomposition of the Population Dynamic Theil's Entropy. It expresses a measure of the weighted sum of the inequalities within each class.*

The graph on Figure 2 shows the values of Dynamic Theil's Entropy (DTE). It give a measure of the inequality among the classes $C_k, k \in \{1, 2, 3, 4, 5\}$ after the standardizing the population. As shown before it coincides with the second addendum of the decomposition of PDTE. As we can see in Figure 2 we expect the inequalities to increase slightly in time for Mexico and Portugal whereas in Spain we expect the inequality among the classes to be constant in time. The highest inequality among the classes occurs for Spain, then for Portugal whereas the lowest occurs for Mexico.

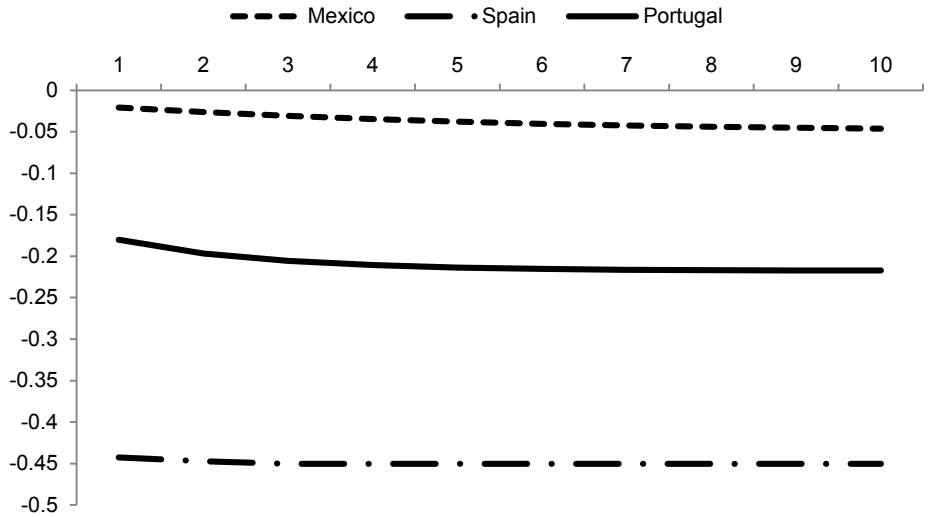
Figure 2: Second Addendum of PDTE




*This figure shows the forecast on a time horizon of 10 years (x-axis) of the values (y-axis) of the Dynamic Theil's Entropy that coincides with the second addendum of the decomposition of the Population Dynamic Theil's Entropy. It expresses a measure of the inequality among the classes.*

The graph on Figure 3 shows the opposite of the mean logarithmic deviation of the real population structure on the uniform distribution $(\overline{n}, \overline{n}, \dots, \overline{n})$. It represents a correction term, always negative as proved in D'Amico, Di Biase and Manca (2014b), that we added to the DTE when computing the inequality among the classes. This addendum may compensate the increase in the inequality caused by standardizing the population.

Figure 3: Third Addendum of PDTE

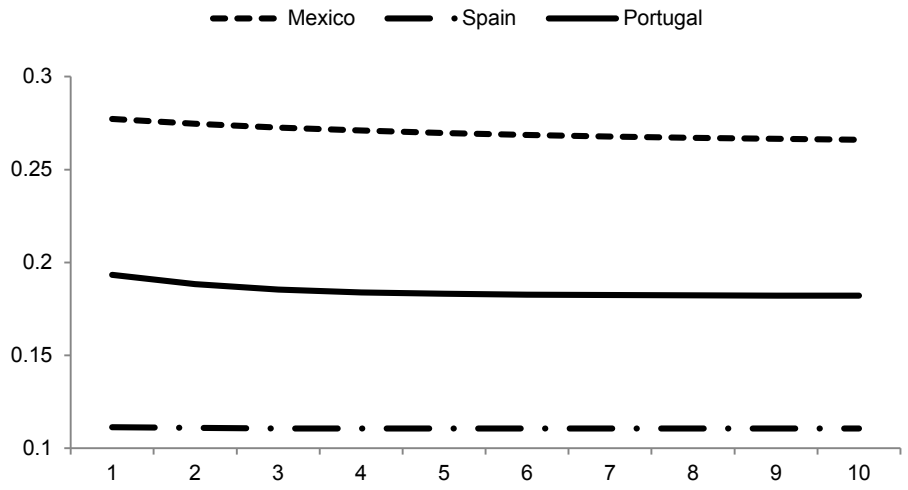



*This figure shows the forecast on a time horizon of 10 years (x-axis) of the values (y-axis) of the third addendum of the decomposition of the Population Dynamic Theil's Entropy. It expresses a correction term.*

Finally in Figure 4 we got the forecast of the PDTE, on a time horizon of ten years, by summing the curves of Figure 1, Figure 2 and Figure 3 for each of the three considered countries. The three curves incorporate also the effect because of the diversity of the agents within the same income class. As we can see, it exists a net ranking of the inequalities in the whole population: Mexico is the country where the inequality is

higher; it comes before Portugal and Spain, where we expect the income to be more equally spread. We expect the inequality to decrease in time in Mexico and Portugal although the decreasing rates are small.

Figure 4: Forecast of PDTE for Mexico, Portugal and Spain




*This Figure shows the forecast on a time horizon of 10 years (x-axis) of the values (y-axis) of the Population Dynamic Theil's Entropy (PDTE) for Mexico, Portugal and Spain. The PDTE evaluates the income inequality in the whole population and not only among the classes in which we classified the economic agents.*

## CONCLUSIONS

In this paper we used the Population Dynamic Theil's Entropy to forecast the income inequality in the years for Mexico, Portugal and Spain. The index, considering both the inequality among the classes in which we assigned the individuals and the inequality within each class, measures the inequality in the whole population. The data used refer to population, means and medians of the individual income for the three countries. They refer to the years from 2004 to 2011. First we recovered the net income distributions and we built the states of the Markov chain model, that is the classes of richness in which we assigned the individuals. Then we computed the net income of the classes and the population configuration evolution for the three countries. After that we estimated the transition probability matrices by minimizing a $\chi$-squared type expression. Next we evaluated the evolution in time of the expected values of the population structure for Mexico, Portugal and Spain. Finally for these three countries we got the forecasting, on a time horizon of ten years, of the values of PDTE. It evaluate the income inequality in the whole population and not only among the classes in which we classified the economic agents.

The results of the application highlight different values of the index. We can remark that it exists a net ranking of inequalities: Mexico is the country where the inequality is the highest; it comes before than Portugal and Spain, where the income is expected to be more equally distributed. In Mexico and Portugal we expect the inequality to decrease in time although the decreasing rates are small. We think the knowledge of the time evolution of the inequality indices plays a fundamental role in programming better economic policies. Therefore the model could be of great help to decision makers. Indeed, although in the considered countries the population mobility among income classes (see Tables 7, 8 and 9) is higher than the mobility registered in others countries (e.g. France, Germany, Greece, Italy, as estimated in D'Amico, Di Biase and Manca, 2012), the values of the index in Spain are constant in time whereas in Mexico and Portugal decrease slightly. This fact leads to the conclusion the changes in the inequalities in these countries are possible only if a consistent change of the income in each class occurs. Proper economical policies could address such

income changes. We could measure the income inequalities in a more accurate way by recovering series of microdata on income evolution. In this way we could calculate the transition matrices by its maximum likelihood estimators. Therefore possible avenues for development of our model could be 1.) A real data application involving microdata, 2.) To set up a geographical model and 3.) The research of numerical bounds aimed to explain the differences among the indices values.

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