

This is the author's version of a work that was accepted for publication in the Journal of Accounting and Public Policy. Changes resulting from the publishing process, such as peer review, editing, corrections, structural formatting and other quality control mechanisms may not be reflected in this document. Changes may have been made to this work since it was submitted for publication. A definitive version was subsequently published in the Journal of Accounting and Public Policy, Volume 32, Issue 3, May-June 2013, Pages 68-88. Special Issue on Accounting and Corporate Governance.  
<http://doi.org/10.1016/j.jaccpubpol.2013.02.004>

**The Impact of Risk Management and Audit Characteristics on Corporate Tax  
Aggressiveness: An Empirical Analysis**

Grant Richardson  
Discipline of Accounting and Information Systems, the Business School  
University of Adelaide  
10 Pulteney Street  
Adelaide, South Australia  
AUSTRALIA 5005

Tel: +61-8-83130582

Fax: +61-8-82234782

[grant.richardson@adelaide.edu.au](mailto:grant.richardson@adelaide.edu.au)

Grantley Taylor  
School of Accounting, Curtin Business School  
Curtin University  
GPO Box U1987  
Perth, Western Australia  
AUSTRALIA 6845

Tel: +61-8-92663377

Fax: +61-8-92667196

[grantley.taylor@cbs.curtin.edu.au](mailto:grantley.taylor@cbs.curtin.edu.au)

Roman Lanis  
School of Accounting  
University of Technology – Sydney  
Corner of Quay Street and Ultimo Road, Haymarket  
Sydney, NSW 2000  
AUSTRALIA

Tel: +61-2-95143081

Fax: +61-2-95143669

E-mail: [Roman.Lanis@uts.edu.au](mailto:Roman.Lanis@uts.edu.au)

# The Impact of Risk Management and Audit Characteristics on Corporate Tax Aggressiveness: An Empirical Analysis

## Abstract

This paper examines the impact of risk management and audit characteristics on corporate tax aggressiveness. Utilizing an 812 firm-year dataset based on the top 300 Australian publicly-listed firms over the 2006–2009 period, our regression results show that if a firm has established an effective risk management system and internal controls, engages a big-4 auditor, its external auditor's services involve proportionally fewer non-audit services than audit services and the more independent is its internal audit committee, it is less likely to be tax aggressive. Our additional regression results also indicate that the interaction effect between board of director composition (i.e., a higher ratio of independent directors on the board) and the establishment of an effective risk management system and internal controls jointly reduce tax aggressiveness.

Keywords: risk management; audit characteristics; corporate tax aggressiveness.

## 1. Introduction

Corporate tax compliance programs undertaken by tax authorities such as the Australian Taxation Office (ATO) emphasize that the strength of a firm's corporate governance structure has a major bearing on whether it is likely to engage in corporate tax aggressiveness (ATO, 2006; 2010).<sup>1</sup> In 2003, the ATO placed tax planning and compliance at the center of good corporate governance strategies (ATO, 2005). In 2005, the ATO recognized that there were encouraging signs that tax aggressiveness was increasingly being accepted as an important corporate governance issue for the board of directors to consider (ATO, 2005).

In examining corporate governance and its association with tax aggressiveness, previous research (e.g., Desai and Dharmapala, 2006; Hanlon and Slemrod, 2009; Chen et al., 2010) does

---

<sup>1</sup> In line with Braithwaite (2005), we define corporate tax aggressiveness as a scheme or arrangement put in place by a firm with the sole or dominant purpose of avoiding tax. This definition is consistent with Australian tax legislation as prescribed in Part IVA of the *Income Tax Assessment Act (1936)*. Examples of tax aggressive activities include the shifting of income or profits to offshore tax havens and the excessive claiming of tax deductions (e.g., interest and R&D expenses) and tax losses that the firm is not entitled to receive. Furthermore, we note that income taxes are all levied at the federal level by the Australian Government. The ATO is responsible for administering the tax system on behalf of the Australian Government to ensure that the correct amount of tax revenue is collected. To this end, the ATO is given the power under the *Income Tax Assessment Act (1936)* to conduct tax audits or reviews (Gilders et al., 2004). Firms with distinctive features and/or indicators (e.g., low effective tax rates, high book-tax gaps, unexplained tax losses and consistently paying little or no income tax) are likely to attract the attention of the ATO and face an increased likelihood of a tax audit or review (ATO, 2006; 2010).

not attempt to break-down corporate governance into its key components. Thus, previous research fails to determine which particular aspects of corporate governance have a significant impact on tax aggressiveness. Recent research by Lanis and Richardson (2011) shows that the composition of a firm's board of directors influences its level of tax aggressiveness. Business compliance research (e.g., Zhara and Stanton, 1988; Zhara and Pearce, 1989; Beasley, 1996; Ibrahim et al., 2003; Uzun et al., 2004) also indicates that the board of directors has a major role to play in monitoring management in the context of undesirable and fraudulent activity in the firm. However, no previous research has explicitly examined the association between the effectiveness of a firm's risk management and internal control systems and tax aggressiveness.

Tax authorities consider risk management to be an essential part of an effective corporate governance structure (ATO, 2006; 2010). Corporate stakeholders have become increasingly concerned about whether a firm has a satisfactory risk management system and sufficient internal controls to alleviate significant firm-related risks (Henderson Global Investors, 2005; KPMG, 2005; Erle, 2008), including tax risks dealing with the complexity of tax laws and regulations, and potential uncertainties regarding the legal interpretation and application of tax laws and regulations in practice (Slemrod, 2004, 2007; Graham and Tucker, 2006). Research by Dyreng et al. (2008), Armstrong et al. (2012) and Rego and Wilson (2012) shows that it is uncertain whether executive management explicitly engage in aggressive tax strategies, or whether they make aggressive financial, investment and other strategic decisions that lead to tax-aggressive behavior in the firm. It is possible that both avenues for tax-aggressive behavior are simultaneously present if the firm's governance structures (including the risk management system and internal controls) are weak and audit-related monitoring mechanisms are lacking.

The directors of many firms recognize that tax cannot be managed independently from a firm's other business activities, and it can have a significant influence on the decisions that are made as a result of the transactions undertaken (KPMG, 2005; Williams, 2007).<sup>2</sup> However, there is a clear disparity in the understanding of tax considerations between the board of directors, internal audit, and a firm's tax department (KPMG, 2005). In fact, a survey of board members found that only 22% of firms carried out regular formal reviews of the tax department by internal audit. Moreover, only 10% of tax departments felt that they were widely understood outside of the tax function (KPMG, 2005).

Tax authorities consider that risk management (especially in terms of tax risk management) is the responsibility of the board of directors (Killaly, 2009; D'Ascenzo, 2008; 2010). The reason for this is that tax is considered to be an ethical issue with a firm's reputational capital at stake if tax arrangements become subject to public scrutiny and/or legal action (Williams, 2007; Erle, 2008). The board is ultimately responsible for implementing policies, processes and systems to ensure that tax risk is minimized in the firm. This involves ensuring that the firm does not engage in activities that are designed primarily to avoid corporate taxes (Erle, 2008; Hartnett, 2008; Schön, 2008). Thus, it is possible that tax aggressiveness may not only be detrimental to the firm, but it also could be regarded a socially irresponsible and illegitimate activity which can have a damaging effect on society as a whole.<sup>3</sup> Potentially, tax aggressiveness could bring-about a significant shortfall in corporate tax revenue which could be used by government to fund the

---

<sup>2</sup> The results of an independent survey of board members indicate that at least 14% of firms had board-approved tax objectives (KPMG, 2005), although this is increasing over time (D'Ascenzo, 2008; 2010).

<sup>3</sup> This view is also consistent with Avi-Yonah (2008) and Schön (2008) whereby a firm has a significant influence that goes beyond its shareholders. Specifically, a firm is a "real world" entity which has to survive the rigors of a competitive business environment and in this context will deal with many other entities and individuals.

provision of public goods in society (Freedman, 2003; Christensen and Murphy, 2004).<sup>4</sup> Thus, corporate governance monitoring mechanisms should help to prevent tax aggressiveness in the context of a wider view of a firm as a “real world” entity (Avi-Yonah, 2008; Schön, 2008).

The Australian Stock Exchange (ASX) also suggests that risk management and internal controls represent a key component of the corporate governance structure of firms and requires publicly-listed firms to disclose information about their risk management policies and internal controls (Group of 100 Incorporated, 2003). Nevertheless, the relationship between board-established corporate governance mechanisms (especially risk management systems and internal controls) and tax aggressiveness has not been adequately examined in the literature.

This paper investigates the impact of risk management and audit characteristics on corporate tax aggressiveness. Employing an 812 firm-year dataset of the top 300 Australian publicly-listed firms over the 2006–2009 period, our regression results show that if a firm has established an effective risk management system and internal controls, engages a big-4 auditor, its external auditor’s services consist of proportionally fewer non-audit services than audit services, and the more independent is its internal audit committee, it is less likely to be tax aggressive. Our additional regression results also indicate that the interaction effect between board of director composition (i.e., a higher ratio of independent directors on the board) and the establishment of an effective risk management system and internal controls jointly reduce tax aggressiveness.

Our study makes several important contributions to the literature. First, it builds on previous research by Desai and Dharmapala (2006), Hanlon and Slemrod (2009) and Chen et al. (2010) that initially suggests a general association between corporate governance and tax aggressiveness

---

<sup>4</sup> Indeed, this shortfall in corporate tax revenue generates hostility and reputational damage for a firm with various stakeholders, and at worst can even result in the cessation of a firm’s business operations (Williams, 2007; Erle, 2008; Hartnett, 2008). Finally, tax aggressiveness also produces a significant and potentially irrecoverable loss to society as a whole (Freedman, 2003; Slemrod, 2004; Schön, 2008).

and more specifically, research by Lanis and Richardson (2011; 2012) that provides evidence that board of director independence and corporate social responsibility (CSR) are significantly negatively associated with tax aggressiveness. We extend these previous studies by examining the impact of other key corporate governance characteristics (i.e., an effective risk management system and internal controls and audit characteristics) on tax aggressiveness. We note that the potential associations between effective risk management systems, audit characteristics and tax aggressiveness have not been examined before in the literature. To the best of our knowledge, this study examines these associations empirically for the first time. Second, as part of our additional analysis, we consider whether there is an interaction effect between board of director composition (i.e., a higher ratio of independent directors on the board) and the board establishing effective risk management systems and tax aggressiveness. This issue has also not been addressed empirically in the literature. Finally, our findings provide valuable information for policymakers and regulators about the fundamental linkages between effective risk management systems, audit characteristics, board of director composition effects and tax aggressiveness to help drive tax policy forward on the issue of good corporate governance practices in firms.

The remainder of the paper is organized as follows. Section 2 considers relevant theory and develops our hypotheses. Section 3 summarizes the research design while Section 4 reports the empirical results. Finally, Section 5 concludes the paper.

## **2. Theory and hypotheses**

Recent research (see, e.g., Desai and Dharmapala; Lanis and Richardson, 2011; Armstrong et al., 2012) suggests that managerial characteristics and the board of directors play an important role in determining the propensity of firms to engage in tax aggressiveness.

Desai and Dharmapala (2006) argue that it is possible for managers to conceal rent extraction through tax aggressiveness if the interaction between rent extraction and tax aggressiveness is complimentary. In fact, the potential rent extraction that accompanies tax aggressiveness, while beneficial to managers, creates significant agency costs for shareholders who in turn may impose a price discount on the firm's share price. Thus, poorly governed firms will become less tax aggressive if managers are offered incentives which align their interests better with those of shareholders. They also claim that shareholders may disapprove of managers engaging in tax aggressiveness, despite gains in after-tax corporate value, because doing so could generate additional opportunities for rent extraction by managers. It is also assumed from Desai and Dharmapala's (2006) theory that well governed firms in situations where tax aggressiveness and rent diversion are substitutes have greater incentive to be tax aggressive (Armstrong et al., 2012). It seems that the complimentary interaction between rent diversion and tax aggressiveness is not well defined by Desai and Dharmapala (2006), thus the association between corporate governance and tax aggressiveness is somewhat ambiguous. Lanis and Richardson (2011) extend the research by Desai and Dharmapala (2006) by suggesting that tax aggressiveness is socially irresponsible and thus to discharge their social responsibility and gain legitimacy within society, a firm should be less tax aggressive. Indeed, appropriate corporate governance monitoring mechanisms should promote compliance with the tax law and the underlying spirit of the tax law, so that a firm is able to exist within society as a going concern (Rose, 2007; Williams, 2007).

The CSR literature (e.g., Pearce and Zahra, 1991; Ibrahim et al., 2003; Rose, 2007) also emphasizes the importance of the board of directors in monitoring the behavior of top management with reference to corporate policy and its impact on the community. Additionally, Lanis and Richardson (2012) also claim that firms which disclose more CSR information are less



likely to be tax aggressive. They find that CSR disclosure is significantly negatively associated with tax aggressiveness, so more socially responsible firms are less likely to be tax aggressive. In this paper, we extend the research by Lanis and Richardson (2012) by examining the impact of other important corporate governance characteristics on tax aggressiveness. Specifically, we argue that the risk management system and internal controls, external auditor type, external auditor independence and audit committee independence are associated with tax aggressiveness. The rationale and literature support for each of these variables is now discussed.

### *2.1. Risk management system and internal controls*

The system of internal controls has become a key corporate governance mechanism for a firm's board of directors to manage significant risk (Cohen et al, 2002; Spira and Page, 2003; Fadzil et al., 2005; Subramaniam and Ratnatunga, 2003; Brennan and Solomon, 2008; Rae et al., 2008). Corporate tax policy represents an integral part of the risk management system and related internal controls (Erle, 2008; Friese et al., 2008; D'Ascenzo, 2008; 2010). However, there is a paucity of research about the success of firms in which the board establishes an effective risk management system and internal controls and tax aggressiveness. A recent study by Lanis and Richardson (2011) provides some unique insights into the association between board of director composition and tax aggressiveness, and provides empirical evidence which links the board of directors to tax aggressiveness. Our first hypothesis aims to extend the research by Lanis and Richardson (2011) by analyzing the association between firms in which the board establishes an effective risk management system and internal controls and tax aggressiveness.

From an agency theory perspective, the board of directors represents a key monitoring mechanism that is used to mitigate any residual loss to the firm's shareholders and thus control

the agency problem (Fama and Jensen, 1983). Subramaniam and Ratnatunga (2003) claim that to enhance the monitoring role of the board, and for a corporate governance structure to be fully effective, the existence and support of a well-designed accounting information system is essential. They argue that accounting information systems are a key source of internal control, by making available accurate and timely information that meets the strategic needs of the board in discharging its corporate governance duties (Subramaniam and Ratnatunga, 2003).

The board of directors receives its authority for internal control and other decisions from the firm's shareholders. This makes the board the apex of decision control within the firm (Fama and Jensen, 1983). The board of directors has the authority to limit any residual loss arising from the agency problem because it has the ultimate responsibility within the agency framework to provide a relatively low-cost mechanism for replacing or re-ordering top management (Fama, 1980). Overall, the board also has ultimate responsibility for all the firm's strategic decisions in discharging duties owed to all stakeholders in society; a view consistent with ongoing corporate law reform in Australia and the UK (Freedman, 2003; Landolf, 2006; Williams, 2007; Avi-Yonah, 2008; Lanis and Richardson 2011).

The CSR literature also stresses the importance of the board of directors in monitoring the behavior of top management in the context of key strategic decisions that affect society as a whole (Pearce and Zahra, 1991; Ibrahim et al., 2003; Rose, 2007). For example, Ibrahim et al. (2003) claim that in their role as supervisors of the corporation's strategic decisions, and in particular that of outside directors should actively support greater corporate responsiveness to society's needs and therefore establish internal control and audit systems necessary to meet those needs. Furthermore, a recommendation is currently before the Australian government that directors should have regard to the interests of stakeholders other than shareholders, which

makes CSR particularly relevant at the board of director level, and provide directors with further motivation to establish internal control and audit systems necessary to meet the needs of society (Parliament of Australia, 2006).

Rae et al. (2008) claim that a firm's internal control system represents an important corporate governance tool. Additionally, they assert that the responsibility for implementing an effective risk management integrated framework lies with managers, and the design of the internal control system and adherence to set policies and procedures represent critical aspects of this framework (Rae et al., 2008). Therefore, an effective risk management system and internal controls enable the board of directors to better monitor and manage risk, including the risk of the firm being overtly tax aggressive. Previous research (see, e.g., DeAngelo et al., 1994; Beasley, 1996; Yermack, 1996; Klein, 1998; Uzun et al., 2004; Karamanou and Vafeas, 2005) has considered the influence of effective monitoring systems on the likelihood of financial reporting and corporate fraud. Overall, the research findings indicate that firms with more effective monitoring of management are less likely to be involved in financial reporting and corporate fraud.

According to Erle (2008), tax risks include the risk of paying less tax than is required according to the tax legislation, and the reputational damage arising from such errors can result in additional costs. Consequently, the board has an important obligation to participate in tax-risk management so that the right balance is created between risk and opportunity in the firm (Erle, 2008; D'Ascenzo, 2008; 2010). In fact, tax represents an essential component of the risk management system and internal controls. As stated by Erle (2008, p. 213): "the same rules apply for tax risks as apply for recognition and control of general business risks and establishing the control environment in general is normally the duty of the board."

In Australia, publicly-listed firms are required to comply with the *ASX Principle 7 Guidelines*, which require the disclosure of: (1) whether the board (or appropriate board committee, such as the risk management committee) has established policies on risk oversight and management; and (2) whether the chief executive officer (CEO) (or equivalent) and the chief financial officer (CFO) (or equivalent) have informed the board about the effectiveness of such policies (Group of 100 Incorporated, 2003).<sup>5</sup> These particular attributes constitute a potential corporate governance mechanism to alleviate agency problems in the shareholder/manager relationship (Erle, 2008; OECD, 2009, ATO, 2006; 2010). Specifically, firms with stronger or more effective risk management systems are less likely to misstate or incorrectly report financial or taxable income, have reduced opportunities to engage in activities that are directed at benefiting executive management, and are less likely to engage in complex and obfuscatory tax aggressiveness activities (Desai and Dharmapala, 2008; Desai and Dharmapala, 2009).

A risk management system that is operating effectively and efficiently is likely to encompass elements of risk oversight and internal control, compliance systems, monitoring and the existence of members of committees (e.g., risk and audit) and the board which are independent and financially literate (Group of 100 Incorporated, 2003). Overall, the existence of an effective risk management system is likely to assist in the management of tax strategies, arrangements, transactions, uncertainties and associated tax risks (Desai and Dharmapala, 2008; Desai and Dharmapala, 2009). We therefore expect firms in which the board establishes an effective risk

---

<sup>5</sup> Changes to the Australian accounting and regulatory framework were made following implementation of the ninth amendment to the *Corporations Act 2001* (CA 2001) under the Corporate Law Economic Reform Program (CLERP 9), effective from July 1, 2004. Thus, CLERP 9 could potentially influence firm disclosure practices in terms of *ASX Principle 7 Guidelines* by introducing civil liability to directors and executives for breach of the ASX's continuous disclosure requirements under Section 647 of the CA 2001. This is likely to increase the motivation of directors and executives to make full and timely disclosures under *ASX Principle 7 Guidelines*.

management system and internal controls to be less inclined to participate in tax aggressiveness.

Our study thus tests the following hypothesis:

**H1:** All else being equal, firms in which the board of directors establishes an effective risk management system and internal controls are less likely to engage in corporate tax aggressiveness.

## *2.2. Big-4 audit firm*

The use of a big-4 audit firm can have a major influence on the level of tax aggressiveness in the firm. Utilization of a big-4 audit firm may help to reduce the tax-aggressive activities of the firm through enhanced monitoring and higher quality audit. Previous research (e.g., Matsumura and Tucker, 1992; Rezaee, 2005) finds a positive association between big-4 auditor use, the perception of audit quality, and the probability of detecting financial statement fraud. Rezaee (2005) contends that big-4 audit firms are more likely to detect financial statement fraud than non-big-4 audit firms because they have greater ability to resist client pressure, have more concern for their reputation, have greater resources in terms of technical expertise and technology, and have a more developed and systematic audit strategy and process in place. Francis (2004) argues that big-4 audit firms, on average, provide higher quality audit reports than non-big-4 audit firms. Indeed, the higher audit fees charged by big-4 audit firms could produce a better quality audit through greater audit effort and the superior expertise and judgment of the auditor (Francis, 2004). Thus, it is likely that clients of big-4 audit firms should exhibit less corporate tax aggressiveness in comparison to non-big-4 audit firm clients.

Nevertheless, big-4 audit firms have a propensity for developing and marketing a wide range of tax-aggressive schemes that allow their audit clients to report higher profits, while at the same

time paying significantly lower amounts of corporate taxes (Sikka and Hampton, 2005; Freise et al., 2008; Sikka, 2010). According to Internal Revenue Service (IRS) data, 61 Fortune 500 firms obtained tax shelter services from their external auditor between 1998 and 2003 for transactions generally reportable on tax returns sent to the IRS. Specifically, the IRS considered many reportable transactions to be abusive, with tax benefits subject to disallowance under existing law. The US Government Accountability Office (GAO, 2005) estimated multi-year potential tax revenue lost to the US federal government from the auditor-related transactions of these 61 firms was around USD\$3.4B. Concerned US policymakers have blamed the large accounting/audit firms for devising and mass-marketing complex tax-aggressive schemes.<sup>6</sup>

Following the demise of Enron<sup>7</sup> and other corporate scandals,<sup>8</sup> the US Congress enacted the *Sarbanes-Oxley Act of 2002*, which restricts allowable non-audit services and requires audit committee approval for tax services. In 2003, the Security and Exchange Commission (SEC) revised its audit fee disclosure rules to require separate statements relating to: (1) audit fees; (2) audit-related fees; (3) tax fees; and (4) other NAS fees (SEC, 2003). The 2003 rule change was mandatory for years ending after December 15, 2003, but required firms to report two years of information initially. However, many other countries such as Australia have not yet enacted

---

<sup>6</sup> In fact, a US Senate Subcommittee concluded that “dubious tax shelter sales were ... assigned to talented professionals at the top of their fields and able to draw upon the vast resources and reputations of the country’s largest accounting firms ... whose products generated hundreds of millions of dollars in phony tax losses for taxpayers, using a series of complex, orchestrated transactions, structured finance, and investments with little or no profit potential” (Senate Permanent Subcommittee on Investigations, 2005, pp. 9-10).

<sup>7</sup> The demise of Enron provides a classic example of the magnitude of tax aggressiveness aided by large accounting firms. Enron with 25,000 employees and USD\$50B of assets became the largest corporate bankruptcy in US history. A US Senate report found that the firm operated through a complex web of 3,500 domestic and foreign subsidiaries and affiliates, many of which never traded but allowed Enron to structure its transactions and escape paying corporate taxes (Senate Joint Committee on Taxation, 2003). Enron’s complex tax schemes were designed by Arthur Andersen and Deloitte and Touche, together with several investment banks and law firms that received around USD\$88M in fees. Enron’s annual reports showed net income of USD\$2.3B for the period 1996-1999, but claimed tax losses of USD\$3B. It paid no tax for 1996-1999. For the year 2000, it reported net income of USD\$3.1B, but claimed a tax loss of USD\$4.6B. Many of the transactions had no commercial substance and were designed solely to avoid corporate taxes. In fact, Enron’s tax-avoidance schemes were so complex that a 2,700-page report by the US Senate was barely able to introduce them (Senate Joint Committee on Taxation, 2003).

<sup>8</sup> For example, the downfall of WorldCom and the Arthur Anderson CPA Firm (Lassila et al., 2010).

specific legislation that restricts allowable non-audit services or requires audit committee approval of tax services for the big-4 audit firms, notwithstanding many cases of tax aggressiveness assisted by the large audit firms.<sup>9</sup>

Given the conflicting views regarding the effect of big-4 audit firms on the level of tax aggressiveness, we make no sign prediction for this potential association. Our study thus tests the following (non-directional) hypothesis:

**H2:** All else being equal, the use of a big-4 audit firm is associated with corporate tax aggressiveness.

### *2.3. External auditor independence*

It is possible that aggressive tax reporting could be constrained by external advisors, such as external auditors (Deloitte, Touche and Tohmatsu, 2005; Schön, 2008). However, non-audit services (as discussed above) could potentially impinge on the level of independence provided to a firm by its external auditor (Sikka and Hampton, 2005; Freise et al., 2008). There is ongoing debate regarding the appropriateness of accounting firms providing non-audit services to their corporate clients (Sikka and Hampton, 2005; Friese et al., 2008). Critics maintain that the substantial fees paid to auditors (especially fees related to non-audit services) increase the financial reliance of the auditor on the firm (Becker et al., 1998), so the auditor's independence could potentially be compromised as they become reluctant to draw attention to the problems associated with the firm's annual report or other business-related activities (Freise et al., 2008).

---

<sup>9</sup> A recurring example of a large Australian firm that is constantly under scrutiny by the ATO for its aggressive tax behavior is News Corporation Ltd. The Economist (1999) found that in the four years prior to June 30, 1998 the firm and its subsidiaries paid only USD\$325M in corporate taxes worldwide. However, in the same period its pre-tax profit was USD\$5.4B. Thus, News Corporation paid an effective tax rate of about 6% (The Economist, 1999). More recently, the US GAO (2008) found that News Corporation had more offshore subsidiaries than almost any other firm operating in the US. The GAO (2008) noted that the firm had a total of 782 foreign subsidiaries, of which 152 were located in tax havens (the British Virgin Islands being the most commonly represented, with a total of 62).

Frankel et al. (2002) provide empirical evidence that the provision of non-audit related services reduces auditor independence and thereby lowers the quality of the firm's financial information. Larcker and Richardson (2004) examine the association between the fees paid to audit firms for audit and non-audit services and the behavior of accounting accruals, and provide evidence of a negative association between these variables. Alexander et al. (2008) contend that the opportunity to engage in tax aggressiveness increases as audit independence diminishes. Elder et al. (2008) find empirical support for the idea that auditor-provided tax services reduce auditor independence. Finally, Armstrong et al. (2012) find that the higher the proportion of taxation fees provided by the auditor, the lower the level of the firm's ETRs. We therefore expect that firms with weak external auditor independence will be more likely to engage in tax aggressiveness. Our study thus tests the following hypothesis:

**H3:** All else being equal, weak external auditor independence is positively associated with corporate tax aggressiveness.

#### *2.4. Internal audit committee independence*

Firms within the S&P/ASX All Ordinaries Index are subject to *ASX Listing Rule 12.7*, which requires that an entity listed in the index at the beginning of its financial year must have an audit committee during that year. The audit committee is required to consist of non-executive directors only.<sup>10</sup> Moreover, the audit committee must be represented by a majority of independent directors, and the chairperson must be independent and not the chairperson of the board. The audit committee primarily oversees the financial reporting processes and related functions of the

---

<sup>10</sup> Specifically, a non-executive director is a director that is not involved in the day-to-day running of the firm, and monitors the actions of the executive directors. These directors may or may not be independent depending on whether they have a material contractual relationship with the firm or whether they are a substantial shareholder of the firm or had previously been employed in an executive capacity with the firm. In most cases, a non-executive director will also be an independent director (Group of 100 Incorporated, 2003).



firm. Independent audit committee directors are considered to enhance the reputation capital of the firm through more effective monitoring of management (Fama and Jensen, 1983). Additionally, provided that a majority of independent directors serve on the firm's audit committee, potential reputational damage could intensify in the event of financial (or tax) misstatements in the firm's annual report (Abbott et. al., 2000).

Abbott et al. (2000) suggest there is evidence to support the idea that an independent audit committee can deter financial reporting aggressiveness and accounting fraud. Indeed, audit committees are expected to assess the nature of the accounting policies used and the accounting and tax estimates made by firms' management. Audit committees are also required to gauge the reasonableness of the methodologies and assumptions used in compiling accounting and tax-related information, why audit adjustments have been made, management's role in the audit process, and an assessment and evaluation of the integrity of the firm's annual report (Klein, 2002). We therefore expect the independence of the internal audit committee to play an important role in minimizing the possibility of tax aggressiveness within the firm. Our study thus tests the following hypothesis:

**H4:** All else being equal, internal audit committee independence is negatively associated with corporate tax aggressiveness.

### **3. Research design**

#### *3.1. Sample selection and data source*

Our sample initially consisted of the top 300 Australian publicly-listed firms over the 2006–2009 period. However, the sample was reduced to 205 firms (812 firm-years) after excluding several firms which fall into the following categories: financial firms (39); insurance firms (11);

US GAAP reporting firms (16); property partnership or trust entities (11); and firms that did not report across all four years of the 2006–2009 period as they were newly incorporated or were taken-over or merged with other firms (20). Finally, the tax and financial accounting related data were hand collected from the annual reports of all sample firms.

### 3.2. *Dependent variable*

Our dependent variable is represented by corporate tax aggressiveness (TAG). We utilize a direct measure of TAG collected from the annual report which is consistent with our definition of tax aggressiveness (see footnote 1). Specifically, where firms are involved in a tax dispute with the ATO regarding tax aggressiveness under the Australian tax legislation as a consequence of a tax audit or review,<sup>11</sup> they are required to disclose this information in their annual report in accordance with Australian Accounting Standard AASB 137 *Provisions, Contingent Liabilities and Contingent Assets* (AASB, 2004).

Contingent liabilities and/or contingent assets may arise for firms, for example, because of unresolved tax disputes with the ATO. Firms must recognize liabilities for anticipated tax audit or review issues based on management's estimate of whether additional corporate taxes will be payable in the future. This will occur if the final tax outcome for firms is different from their current and deferred tax estimates in the current financial period (AASB, 2004). Accordingly, we measure TAG in our study as a dummy variable, coded 1 if the firm is subject to a tax dispute

---

<sup>11</sup> The ATO (2006; 2010) verifies compliance with tax legislation through firm audits and risk reviews where there is a serious likelihood of non-compliance with tax laws and a significant amount of corporate tax revenue is at stake. The ATO (2006; 2010) employs statistical modeling and relationship-mapping tools using external data (i.e., data from financial institutions or regulatory bodies, such as the Australian Transaction Reports and Analysis Centre) that monitors movement of funds into and out of Australia and tax data, together with data about past corporate taxpayer behavior and governance around their tax liabilities to assess the likelihood of non-compliance. Claims for excessive tax deductions, mismatches between income and tax paid, development of schemes or arrangements that appear to have a dominant tax purpose or non-commercial in nature, tax evasion where firms actively and systematically avoid paying taxes, use of preferential tax regimes such as tax havens to reduce the amount of corporate taxes payable are examples of activities that would lead to an audit or review by the ATO (2006; 2010).

with the ATO concerning tax aggressiveness under the Australian tax legislation during the 2006–2009 sample period, otherwise 0.

Table 1 reports the different types of tax aggressive activities engaged in by firms in the sample that are involved in tax dispute with the ATO in the 2006–2009 sample period, together with the number of firm-years in the sample. We find that 30 firms in our sample (around 15% of the total sample) are subject to tax dispute with the ATO about tax aggressiveness. The most common type of activity relates to corporate restructuring (16.67%). Other frequently occurring types of tax aggressiveness include the deductibility of interest expenses (13.34%), assets disposals (10%), the deductibility of intellectual property (10%), the deductibility of R&D expenses (10%), the deductibility of tax losses (10%) and offshore income tax exemptions (10%). Other tax aggressive activities consist of claiming capital gains tax losses (6.67%), the acquisition of dividend franking credits (3.33%), the deductibility of bad debts (3.33%), the deductibility of concession fees (3.33%) and the deductibility of pre-contract work expenses (3.33%). A common feature of the majority of tax aggressive activities reported in Table 1 is that they generate tax deductions (i.e., interest, intellectual property, R&D and tax loss deductions) that a firm can utilize to offset assessable income and therefore reduce its taxable income. Finally, Table 1 reports a total of 100 tax aggressive activity firm-year observations during the 2006–2009 sample period, ranging from 26 observations in 2006 to 24 observations in 2009. We acknowledge that the number of firm observations may vary slightly from year-to-year (i.e., from 2006 to 2009) because of the commencement and/or settlement of a tax dispute with the ATO within a particular year.

**[Insert Table 1 About Here]**

### *3.3. Independent variables*

Our independent variables are denoted by the existence of an effective risk management system and internal controls (RMS), external auditor type (AUD), external auditor independence (EAI) and internal audit committee independence (ACI).

RMS is measured as a dummy variable, coded 1 if the board establishes a formal risk management system and internal controls in the firm, and if the CEO and the CFO state to the board in writing that the risk management system and internal controls are operating effectively in all material respects, otherwise 0. We expect RMS to have a negative sign. AUD is measured as a dummy variable, coded 1 if the firm uses a big four external auditor, otherwise 0. We make no sign prediction for AUD given the conflicting views presented in this paper about the effect of a big-4 audit firm on the level of tax aggressiveness. EAI is measured as non-audit fees divided by total audit fees. Thus, the higher the value of EAI, the less independent is the external auditor of the firm. We expect EAI to have a positive sign. ACI is measured as the total number of independent audit committee members in the firm divided by the total number of audit committee members in the firm. Therefore, the higher the value of ACI, the more likely it is that the audit committee is independent. We expect ACI to have a negative sign.

#### *3.4. Control variables*

To control for other effects, we include several control variables in our base regression model that relate to standard determinants of tax aggressiveness, such as: equity-based remuneration paid to key management personnel (EQR), firm size (SIZE), leverage (LEV), capital intensity (CINT), R&D intensity (RDINT), inventory intensity (INVINT), the existence of foreign OECD (2006) tax haven subsidiaries (FTH), the market-to-book ratio (MKTBK), return on assets (ROA), industry-sector (INDSEC) effects and year (YEAR) effects.

Several studies (see, e.g., Desai and Dharmapala, 2006; Rego and Wilson, 2012) have examined the impact of executive compensation on tax aggressiveness. Desai and Dharmapala (2006) find that increases in equity-based incentives lead to a reduction in the level of tax aggressiveness. Rego and Wilson (2012) find a positive association between aggressive tax reporting and the level of CEO and CFO compensation. We thus include EQR (measured as the equity-based remuneration of key management personnel divided by the total remuneration of key management personnel) in our study to control for the alignment of board and shareholder interests, and to control for board incentives to engage in risk oversight. No sign prediction is made for EQR due to the inconsistent results obtained for EQR in previous research.

SIZE (measured as the natural log of total assets) is utilized in our study to control for size effects. Based on previous Australian research (Tran, 1997; Richardson and Lanis, 2007), we expect to find that larger firms are more likely to be tax aggressive because they possess superior economic and political power relative to smaller firms (Siegfried, 1972) and are able to reduce their tax burdens accordingly.

LEV is long-term debt divided by total assets, CINT is net property, plant and equipment divided by total assets, and RDINT is R&D expenditure divided by total assets. Previous research (Stickney and McGee, 1982; Gupta and Newberry) finds that LEV, CINT, and RDINT are positively associated with tax aggressiveness. Specifically, LEV is positively associated with tax aggressiveness due to tax-deductible interest payments, CINT is positively associated with tax aggressiveness as a result of accelerated depreciation charges based on asset lives, and RDINT is positively associated with tax aggressiveness owing to tax-deductible R&D expenditure. We also include INVINT (inventory divided by total assets) in our study. To the extent that INVINT is a substitute for CAPINT, inventory-intensive firms should be less tax

aggressive than capital-intensive firms (Stickney and McGee, 1982).

FTH (a dummy variable, coded 1 if the firm has at least one subsidiary firm incorporated in an OECD (2006) listed tax haven, otherwise 0) controls for firms' utilization of international tax havens. The use of tax havens is positively associated with tax aggressiveness as it is used to minimize the firm's overall tax position (Desai et al., 2006; Dharmapala and Hines, 2009).

We also include a growth control variable represented by MKTBK (the market value of equity divided by the book value of equity) in our study (see, e.g., Gupta and Newberry, 1997; Adhikari et al., 2006). Because of the conflicting results obtained in previous research, we make no sign prediction for MKTBK.

A profitability control variable denoted by ROA (pre-tax income divided by total assets) is also included in our study (see, e.g., Gupta and Newberry, 1997; Adhikari et al., 2006). However, owing to the inconsistent results obtained for this variable in previous research, we make no sign prediction for ROA.

Industry-sector (INDSEC) dummy variables, defined by the two-digit Global Industry Classification Standard (GICS) codes, are included as control variables in our study as it is possible for tax aggressiveness to fluctuate across different industry sectors (see, e.g., Omer et al., 1993; Dyreng et al., 2008). We include ten INDSEC dummy variables in our study: consumer discretionary, consumer staples, energy, health care, information technology, materials, real estate, telecommunications, transport, and utilities.<sup>12</sup> No sign predictions are made for the industry-sector dummies.

---

<sup>12</sup> With transport being the omitted industry sector in our base regression model.

Finally, year (YEAR) dummy variables are also included in our study to control for differences in corporate tax aggressiveness activities that could possibly exist over the 2006–2009 sample years.<sup>13</sup> No sign predictions are made for the YEAR dummies.

### 3.5. Base regression model

The base regression model used to examine the impact of risk management and audit characteristics on corporate tax aggressiveness is represented as follows:

$$\begin{aligned} \text{TAG}_{it} = & \alpha_0 + \beta_1 \text{RMS}_{it} + \beta_2 \text{AUD}_{it} + \beta_3 \text{EAI}_{it} + \beta_4 \text{ACI}_{it} + \beta_5 \text{EQR}_{it} + \beta_6 \text{SIZE}_{it} + \beta_7 \text{LEV}_{it} \\ & + \beta_8 \text{CINT}_{it} + \beta_9 \text{RDINT}_{it} + \beta_{10} \text{INVINT}_{it} + \beta_{11} \text{FTH}_{it} + \beta_{12} \text{MKTBK}_{it} + \beta_{13} \text{ROA}_{it} \\ & + \beta_{14-22} \text{INDSEC}_{it} + \beta_{23-25} \text{YEAR}_i + \varepsilon_{it} \end{aligned} \quad (1)$$

where:  $i$  = firms 1–812;  $t$  = financial years 2006–2009; TAG = a dummy variable, coded 1 if the firm is subject to a tax dispute with the ATO concerning tax aggressiveness under the Australian tax legislation during the 2006–2009 sample period, otherwise 0; RMS = a dummy variable, coded 1 if the board establishes a formal risk management system and internal controls in the firm, and if the CEO and the CFO state to the board in writing that the risk management system and internal controls are operating effectively in all material respects, otherwise 0; AUD = a dummy variable, coded 1 if the firm uses a big four external auditor, otherwise 0; EAI = non-audit fees divided by total audit fees; ACI = the number of independent audit committee members divided by the total number of audit committee members; EQR = the equity based remuneration of key management personnel divided by the total remuneration of key management personnel; SIZE = natural logarithm of total assets; LEV = long-term debt divided by total assets; CINT = net property, plant and equipment divided by total assets; RDINT = R&D expenditure divided by total assets; INVINT = inventory divided by total assets; FTH = a

---

<sup>13</sup> With the 2009 year being the omitted year in our base regression model.

dummy variable, coded 1 if the firm has at least one subsidiary company incorporated in an OECD (2006) listed tax haven, otherwise 0; MKTBK = the market value of equity divided by the book value of equity; ROA = pre-tax income divided by total assets; INDSEC = industry sector dummy variable, coded 1 if the firm is represented in the particular GICS category, otherwise 0; YEAR = year dummy variable, coded 1 if the year falls within the specific year category, otherwise 0; and  $\varepsilon$  = error term.

## 4. Empirical results

### 4.1. Descriptive statistics

Table 2 reports descriptive statistics for the dependent variable (TAG), independent variables (RMS, AUD, EAI and ACI), and control variables (EQR, SIZE, LEV, CINT, RDINT, INVINT, FTH, MKTBK and ROA). For the dependent variable, we find that the sample firms have a mean tax aggressiveness (TAG) level of approximately 12.3%. In terms of the independent variables, we observe that the sample firms have a mean effective risk management system (RMS) of around 84.9%. We also find that, on average, 84.7% of firms in the sample employ a big-4 external auditor (AUD) and that for external auditor independence (EAI), 28.4% of non-audit fees are derived by external audit firms. Finally, we observe that the mean value for audit committee independence (ACI) is approximately 88.7%.

**[Insert Table 2 About Here]**

### 4.2. Correlation results

The Pearson pairwise correlation results are presented in Table 3. We find significant correlations between TAG and RMS, EAI and ACI ( $p < .01$ ). We also find significant correlations between TAG and several of the control variables, including EQR, SIZE, LEV,



CINT, RDINT and FTH ( $p < .10$  or better). Moreover, Table 3 shows that only moderate levels of collinearity exist between our explanatory variables. Finally, we compute variance inflation factors (VIFs) when estimating our regression models to test for signs of multi-collinearity between the explanatory variables. We find that no VIFs exceed five, so multi-collinearity is not problematic in our study (Hair et al., 2006).

**[Insert Table 3 About Here]**

#### *4.3. Logit regression results*

Given that our dependent variable (tax aggressiveness) is a dummy variable, we employ logit regression analysis (see, e.g., Hair et al., 2006) to test our hypotheses. Table 4 reports the logit regression results for the base regression model which considers the impact of risk management and audit characteristics on corporate tax aggressiveness.<sup>14</sup> The regression coefficient for RMS is negative and significantly associated with tax aggressiveness ( $p < .01$ ), providing support for H1. Thus, the higher the level of risk management and internal control effectiveness in the firm, the lower the level of tax aggressiveness. This result is consistent with our expectation that firms which build and maintain an effective risk management system and internal controls are less likely to be tax aggressive. The regression coefficient for AUD is negative and significantly associated with tax aggressiveness ( $p < .05$ ), which supports H2. The use of a big-4 auditing firm reduces the likelihood of tax aggressiveness, despite the fact that a big-4 auditing firm could be providing non-audit services (including tax services) to their corporate clients. The regression coefficient for EAI is positive and significantly associated with tax aggressiveness ( $p < .01$ ), providing support for H3. This result is consistent with our expectation that firms with weak external auditor independence are more likely to engage in tax aggressiveness. The regression

---

<sup>14</sup> We note that standard errors are corrected using the White (1980) procedure for all of the regression models reported in this paper.

coefficient for ACI is negative and significantly associated with tax aggressiveness ( $p < .05$ ), which supports H4. Thus, internal audit committee independence plays an important role in reducing the likelihood of tax aggressiveness in the firm. We also find that several of our control variables are significantly associated with tax aggressiveness, including EQR ( $p < .10$ ), SIZE ( $p < .01$ ), LEV ( $p < .01$ ), CINT ( $p < .05$ ) and ROA ( $p < .10$ ).

**[Insert Table 4 About Here]**

#### *4. 4. Additional analysis*

Fama and Jensen (1983) assert that the board of directors represents the highest internal control mechanism for monitoring the actions of top management in the firm. They theorize that independent directors have incentives to conduct their monitoring tasks and not collude with top managers to expropriate shareholder wealth, so the addition of independent directors on the board should increase the board's ability to monitor top management effectively. Beasley (1996) finds that the inclusion of a higher proportion of independent directors on the board of directors reduces the likelihood of financial statement fraud. Lanis and Richardson (2011) also find that the addition of a higher proportion of independent directors on the board reduces the possibility of corporate tax aggressiveness.<sup>15</sup>

This implies that the composition of the board of directors could interact with the board's ability to establish an effective risk management system and internal controls to jointly reduce the likelihood of tax aggressiveness in the firm. Accordingly, we conjecture that the interaction effect between board of director composition (i.e., a higher proportion of independent directors on the board) and the board's establishment of an effective risk management system and internal

---

<sup>15</sup> Lanis and Richardson (2011) also analyzed the effect of the institutional ownership (INST) monitoring mechanism on tax aggressiveness. Their results show that the association between INST and tax aggressiveness is not statistically significant across a number of regression model specifications. We also consider INST in this study, however, our results consistently show that INST and its interaction with the risk management system variable (i.e., INST\*RMS) are not statistically significant. These additional results are available from the authors upon request.

controls could be negatively associated with tax aggressiveness. We now extend our base OLS regression model in Eq. (1) to empirically test our conjecture as follows:

$$\begin{aligned} \text{TAG}_{it} = & \alpha_0 + \beta_1 \text{RMS}_{it} + \beta_2 \text{AUD}_{it} + \beta_3 \text{EAI}_{it} + \beta_4 \text{ACI}_{it} + \beta_5 \text{BODI}_{it} + \beta_6 \text{BODI} * \text{RMS}_{it} \\ & + \beta_7 \text{EQR}_{it} + \beta_8 \text{SIZE}_{it} + \beta_9 \text{LEV}_{it} + \beta_{10} \text{CINT}_{it} + \beta_{11} \text{RDINT}_{it} + \beta_{12} \text{INVINT}_{it} \\ & + \beta_{13} \text{FTH}_{it} + \beta_{14} \text{MKTBK}_{it} + \beta_{15} \text{ROA}_{it} + \beta_{16-24} \text{INDSEC}_{it} + \beta_{25-27} \text{YEAR}_i + \varepsilon_{it} \end{aligned} \quad (2)$$

where: BODI = a dummy variable, coded 1 if the firm has a board of directors which is largely (>70%) made-up of independent directors, otherwise 0;<sup>16</sup> and BODI\*RMS = an interaction term computed by multiplying IND by RMS.

Table 5 reports the logit regression results for the extended base regression model, which consider the joint impact of board of director composition and the board's establishment of an effective risk management system and internal controls on tax aggressiveness. The regression coefficient for RMS\*BODI is negative and significantly associated with tax aggressiveness ( $p < .05$ ). This finding provides support for our conjecture that the interaction effect between board of director composition (i.e., a higher proportion of independent directors on the board) and the board's establishment of an effective risk management system and internal controls reduces tax aggressiveness in the firm. We also observe that the regression coefficient for BODI is negative and significantly associated with tax aggressiveness ( $p < .05$ ), thereby confirming Lanis and Richardson's (2011) results. A high proportion of independent directors on the board of directors improves the monitoring of management, and thus reduces the likelihood of tax aggressiveness. Additionally, we obtain reasonably similar results to those reported in Table 4 for the RMS, AUD, EAI and ACI regression coefficients, in terms of statistical significance and predicted sign (where appropriate) in our extended regression model. Finally, the regression coefficients for the

---

<sup>16</sup> We also employ a dummy variable coded 1 if the board of directors has more than 60% independent directors, otherwise 0, and our results are qualitatively similar to those reported in Table 5. These additional results are available from the authors upon request.

control variables (EQR, SIZE, LEV, CINT and ROA) are also similar to those reported in Table 4 in terms of statistical significance and predicted sign (where appropriate).

**[Insert Table 5 About Here]**

#### *4. 5. Robustness checks*

We perform several (unreported) robustness checks to assess the reliability of our logit regression results presented in Tables 4 and 5. First, to deal with potential outlier problems, we winsorize the variables (see, e.g., Wilcox, 2001) that are more than four standard deviations from their respective means and re-estimate our logit regression models. We find that our main regression results for RMS, EAI, AUD, ACI, BODI and RMS\*BODI in terms of statistical significance and predicted signs (where appropriate) are comparable to those reported in Tables 4 and 5. Second, we test for endogeneity in our logit regression models by lagging all of our independent variables (RMS, EAI, AUD, ACI, BODI and RMS\*BODI) by one year (i.e., t-1) and re-running our logit regression models. Again, our main regression results are consistent with those reported in Tables 4 and 5. Third, we re-estimate the logit regression models using non-parametric logit regression analysis (see, e.g., Green and Silverman, 1994). Our results show that the regression coefficients for RMS, EAI, AUD, ACI, BODI and RMS\*BODI have similar levels of statistical significance and the same predicted signs (where appropriate) to those reported in Tables 4 and 5. Finally, we ran year-by-year cross-sectional logit regressions (see, e.g., Hair et al., 2006) to determine if our main results vary by year. As per the additional empirical testing, our yearly logit regression results for RMS, EAI, AUD, ACI BODI and RMS\*BODI are essentially the same as those reported in Tables 4 and 5 in terms of statistical significance and predicted signs (where appropriate). These checks indicate the overall reliability of our logit regression results.

#### 4.6. Sensitivity analysis

We also carry out a sensitivity analysis of our results by employing several proxy measures of tax aggressiveness as the dependent variable. These measures have been widely used in the accounting literature (see, e.g., Stickney and McGee, 1982; Gupta and Newberry, 1997; Rego, 2003; Manzon and Plesko, 2002; Desai and Dharmapala, 2006; Dyreng et al., 2008; Chen et al., 2010; Cheng et al., 2012; McGuire et al., 2012) and/or emphasized by the ATO (2006; 2010) in its corporate tax compliance programs as indicative of tax aggressiveness. Specifically, we use effective tax rates (ETRs) and the book-tax gap (BTG) as proxy measures of tax aggressiveness as the dependent variable. Each variable is a reflection of tax planning that reduces a firm's taxable income without necessarily reducing its accounting income.

ETRs are usually calculated as tax liability divided by pre-tax accounting income to compare the tax liability generated by taxable income to pre-tax accounting income based on generally accepted accounting principles (GAAP) (Rego, 2003). ETRs thus measure the ability of a firm to reduce its tax liability compared with its pre-tax accounting income and shows the relative tax burden across firms (Rego, 2003). Tax aggressiveness influences ETRs in at least two ways. First, it often generates book-tax differences that cause variation in the ETR because the numerator is based on taxable income, whereas the denominator is based on financial accounting income. Tax-motivated transactions (e.g., foreign sales, tax exempt income, tax credits and deferral of income recognition) generally lower ETRs. Second, firms often use their foreign operations to avoid paying income tax, and ETRs capture this form of tax aggressiveness. For instance, shifting income from a high-tax jurisdiction to a low-tax jurisdiction reduces ETRs.<sup>17</sup> Overall, firms that avoid income taxes by reducing their taxable income while maintaining their

---

<sup>17</sup> The ETR is lowered because the denominator remains constant (pre-tax accounting income has not changed), whereas the numerator is smaller (income taxes currently payable have decreased).

financial accounting income have lower ETRs, which suggests that ETRs are a suitable measure of tax aggressiveness (Rego, 2003). Thus, our first measure of corporate tax aggressiveness (ETR1) is calculated as income tax expense divided by pre-tax accounting income (see, e.g., Gupta and Newberry, 1997). Our second measure of tax aggressiveness (ETR2) is computed as cash taxes paid divided by pre-tax accounting income (see, e.g., Dyreng et al., 2008).<sup>18</sup>

The BTG (or book-tax difference) has been proposed as a measure of tax aggressiveness (Mills, et al., 1998; Manzon and Plesko, 2002; Desai and Dharmapala, 2006) because large differences between accounting (or book) income and taxable income are typical among firms that exhibit greater tax-aggressive behavior (Mills et al., 1998; Frank et al., 2009; Wilson, 2009; Lisowsky, 2010).<sup>19</sup> Firms can structure transactions to generate large temporary or permanent differences between accounting income and taxable income.<sup>20</sup> Our third measure of tax aggressiveness (BTG1) is based on the raw book-tax gap, computed as pre-tax accounting income less taxable income,<sup>21</sup> as per Manzon and Plesko (2002). Our fourth measure of tax aggressiveness (BTG2) is calculated as the BTG residual in keeping with Desai and Dharmapala (2006).<sup>22</sup> We adjusted the BTG in the same way as Desai and Dharmapala (2006) to control for earnings management activities that could be responsible for the book-tax gap. Specifically, the component of BTG attributable to earnings management is removed to leave a residual value that is inferred to measure tax aggressiveness.

---

<sup>18</sup> We note that ETRs are truncated to the 0-1 range in this study, in keeping with previous research (see, e.g., Gupta and Newberry, 1997; Adhikari et al., 2006; Chen et al., 2010). Additionally, given that a higher ETR represents a proxy measure of a lower level of tax aggressiveness, we transform ETR1 and ETR2 by multiplying them by -1 to obtain increasing measures of tax aggressiveness for the empirical analysis (see, e.g., Lanis and Richardson, 2012).

<sup>19</sup> For instance, Mills et al. (1998) find that firms with greater BTGs have larger IRS audit adjustments, which is consistent with higher levels of tax aggressiveness. Moreover, using confidential tax shelter and tax return data obtained from the IRS, research by Lisowsky (2010) shows that BTG proxy measures of tax aggressiveness are particularly accurate measures of corporate tax aggressive activities.

<sup>20</sup> For example, the use of depreciation expenses can produce temporary book-tax differences, whereas the use of R&D tax credits can generate permanent book-tax differences.

<sup>21</sup> Specifically, taxable income is computed as income tax expense divided by the statutory tax rate of 30%.

<sup>22</sup> A brief description of the method developed by Desai and Dharmapala (2006) for calculating the BTG residual is provided in Appendix A.

Table 6 reports the results of the ordinary least squares (OLS) regression analysis (see, e.g., Hair et al., 2006) for our base regression model (Eq. 1), along with our extended regression model (Eq. 2) in terms of the ETRs and BTG proxy measures of tax aggressiveness. For our base regression model (Eq. 1), the regression coefficient for RMS is significantly negatively associated with ETR1, BTG1 and BTG2 ( $p < .05$ ), providing support for H1. The regression coefficient for AUD is negative and significantly associated with ETR1, ETR2 and BTG1 ( $p < .10$  or better), which supports H2. The regression coefficient for EAI is positive and significantly associated with ETR1 and ETR2 ( $p < .01$ ), providing support for H3. The regression coefficient for ACI is negative and significantly associated with ETR1, ETR2 and BTG1 ( $p < .10$ ), which support H4. We also find that a number of our control variables are significantly associated with ETR1, ETR2, BTG1 and/or BTG2 ( $p < .10$  or better) with predicted signs (where appropriate), including EQR, SIZE, LEV, CINT, RDINT, INVINT, FTH and ROA.

For our extended regression model (Eq. 2), the regression coefficient for RMS\*BODI is negative and significantly associated with ETR1, ETR2, BTG1 and BTG2 ( $p < .10$  or better), providing support for our conjecture that the interaction effect between board of director composition (i.e., a higher proportion of independent directors on the board) and the board's establishment of an effective risk management system and internal controls reduces tax aggressiveness. The regression coefficient for BODI is negative and significantly associated with ETR1 and ETR2 ( $p < .05$ ). We also find that the regression coefficients for RMS, AUD, EAI and ACI are significantly associated with ETR1, ETR2, BTG1 and/or BTG2 ( $p < .10$  or better) with predicted signs (where appropriate). Finally, the regression coefficients for our control variables (EQR, SIZE, LEV, CINT, RDINT, INVINT, FTH and ROA) are significantly associated with ETR1, ETR2, BTG1 and/or BTG2 ( $p < .10$  or better) with predicted signs (where appropriate).

Overall, our OLS regression results based on the ETRs and BTG proxy measures of tax aggressiveness are reasonably consistent with those reported in Tables 4 and 5 of the paper.

**[Insert Table 6 About Here]**

## **5. Conclusions**

This paper examines the impact of risk management and audit characteristics on corporate tax aggressiveness. Our regression results show that if a firm has established an effective risk management system and internal controls, engages a big-4 auditor, its external auditor's services involve proportionally fewer non-audit services than audit services and the more independent is its internal audit committee, it is less likely to be tax aggressive. Our additional regression results also indicate that the interaction effect between board of director composition (i.e., a higher ratio of independent directors on the board) and the establishment of an effective risk management system and internal controls jointly reduce tax aggressiveness.

Our study provides unique insights into the nature and extent to which an effective risk management system and internal controls and various audit characteristics are associated with tax aggressiveness. In so doing, this study extends the literature on corporate governance and tax aggressiveness. Moreover, our findings regarding effective risk management systems, audit characteristics, board of director composition and tax aggressiveness should be of value to policymakers and regulators. In particular, our findings could assist in the development of policy on effective corporate governance practices and the extent to which these practices might assist tax authorities in dealing with tax aggressiveness.

This study is subject to several limitations. First, the sample is limited to publicly-listed firms as we were only able to collect information regarding tax aggressiveness that is in the public domain. Information about tax aggressiveness among private firms is not publicly available due



to confidentiality concerns. Second, we should note that our significant empirical results are only indicative of associations between tax aggressiveness and our independent variables, not causation between these variables.

Future research into corporate governance and tax aggressiveness could examine the practices which outside (independent) directors employ to determine the corporate tax risks of the firm. A better understanding of the means by which outside (independent) directors exert control over board actions relating to tax risks may be beneficial.

## References

- Abbott, L.J., Park, Y., Parker, S., 2000. The effects of audit committee activity and independence on corporate fraud. *Managerial Finance* 26 (11), 55-67.
- Adhikari, A., Derashid, C., Zhang, H., 2006. Public policy, political connections, and effective tax rates: longitudinal evidence from Malaysia. *Journal of Accounting and Public Policy* 25, 574-595.
- Agrawal, A., Chadha, S., 2005. Corporate governance and accounting scandals. *Journal of Law and Economics* 48 (2), 371-406.
- Alexander, R., Ettredge, M., Stone, M., Sun, L., 2008. Assessing corporate tax aggressiveness. Working paper, University of Kansas.
- Armstrong, C.S., Blouin, J.L., Larcker, D.F., 2012. The incentives for tax planning. *Journal of Accounting and Economics* 53, 391-411.
- Australian Accounting Standards Board. 2004. Provisions, Contingent Liabilities and Contingent Assets. Australian Accounting Standards Board, Melbourne, VIC.
- Australian Taxation Office, 2005. Updated Compliance Program 2005-06. Australian Taxation Office, Canberra, ACT.
- Australian Taxation Office, 2006. Large Business and Tax Compliance. Australian Taxation Office, Canberra, ACT.
- Australian Taxation Office, 2010. Large Business and Tax Compliance. Australian Taxation Office, Canberra, ACT.
- Avi-Yonah, R.S., 2008. Corporate social responsibility and strategic tax behavior. In: Schön, W. (Ed.), *Tax and Corporate Governance*. Springer-Verlag, Berlin Heidelberg.
- Beasley, M.S., 1996. An empirical analysis of the relation between the board of director composition and financial statement fraud. *The Accounting Review* 71 (4), 443-465.
- Becker, C., DeFond, M., Jiambalvo, J., Subramanyam, K.R., 1998. The effect of audit quality on earnings management. *Contemporary Accounting Research* 15 (1), 1-24.
- Braithwaite, J., 2005. *Markets of Vice, Markets of Virtue*. Federation Press, Sydney, NSW.
- Brennan, N.M., Solomon, J., 2008. Corporate governance, accountability and mechanisms of accountability: an overview. *Accounting, Auditing & Accountability Journal* 21 (7), 885-906.
- Chen, S., Chen X., Cheng, Q., Shevlin, T., 2010. Are family firms more tax aggressive than non-family firms? *Journal of Financial Economics* 95, 41-61.
- Cheng, C.S.A., Huang, H.E., Li, Y., Stanfield, J., 2012. The effect of hedge fund activism on corporate tax avoidance. *The Accounting Review*, in press. Available at: <http://aaaajournals.org/toc/accr/0/0>.
- Christensen, L., Murphy, R., 2004. The social irresponsibility of corporate tax avoidance: taking CSR to the bottom line. *Development* 47 (3), 37-44.
- Cohen, J., Krishnamoorthy, G., Wright, A.M., 2002. Corporate governance and the audit process. *Contemporary Accounting Research* 19 (4), 573-594.
- D'Ascenzo, M., 2008. Corporate governance and tax risk management. Speech at the Australian Risk Policy Institute and National Institute of Governance Inaugural Winter Seminar, University of Canberra, July 10, 2008. Available at: [http://www.arpi.org.au/policy\\_papers.html#B](http://www.arpi.org.au/policy_papers.html#B).

- D'Ascenzo, M., 2010. What's tax got to do with it? Speech to the Australian Institute of Company Directors. Sydney, February 16, 2010. Available at: <http://www.ato.gov.au/corporate/content.aspx?doc=/content/00231451.htm>.
- DeAngelo H., DeAngelo, L., Skinner, D.J., 1994. Accounting choice in troubled companies. *Journal of Accounting and Economics* 17, 113-143.
- Deloitte, Touche and Tohmatsu. 2005. Audit Committee Self-Assessment. Deloitte, Touche and Tohmatsu, Sydney, NSW.
- Desai, M.A., Dharmapala, D., 2006. Corporate tax avoidance and high-powered incentives. *Journal of Financial Economics* 79, 145-179.
- Desai, M.A., Dharmapala, D., 2008. Taxation and corporate governance: an economic approach. *MPI Studies on Intellectual Property, Competition and Tax Law* 3 (1), 13-30.
- Desai, M.A., Dharmapala, D., 2009. Corporate tax avoidance and firm value. *The Review of Economics and Statistics* 91 (3), 537-546.
- Desai, M.A., Foley, C.F., Hines, J.R., 2006. The demand for tax haven operations. *Journal of Public Economics* 90, 513-531.
- Dharmapala, D., Hines, J.R., 2009. Which firms become tax havens? *Journal of Public Economics* 93, 1058-1068.
- Dyregang, S., Hanlon, M., Maydew, E., 2008. Long-run corporate tax avoidance. *Accounting Review* 83 (1), 61-82.
- Elder, R.J., Harris, D.G., Zhou, J., 2008. Tax consulting and reported weakness in internal control. Available at SSRN: <http://ssrn.com/abstract=991328>.
- Erle, B., 2008. Tax risk management and board responsibility. In: Schön, W. (Ed.), *Tax and Corporate Governance*. Springer-Verlag, Berlin, Heidelberg.
- Fadzil, F.M., Haron, H., Jantan, M., 2005. Internal auditing practices and internal control system. *Managerial Auditing Journal* 20 (8), 844-866.
- Fama, E.F., 1980. Agency problem and the theory of the firm. *Journal of Political Economy* 88, 288-308.
- Fama, E.F., Jensen, M., 1983. Agency problems and residual claims. *Journal of Law and Economics* 26 (2), 327-349.
- Francis, J.R., 2004. What do we know about audit quality? *The British Accounting Review* 36, 345-368.
- Frank, M.M., Lynch, J.L., Rego, S.O., 2009. Are financial and tax reporting aggressiveness reflective of broader corporate policies? *The Accounting Review* 84 (2), 467-496.
- Frankel, R., Johnson, M., Nelson, K., 2002. The relation between auditors' fees for non-audit services and earnings management. *The Accounting Review* 77, 71-105.
- Freedman, J., 2003. Tax and corporate responsibility. *Tax Journal* 695 (2), 1-4.
- Freise, A., Link, S., Mayer, S., 2008. Taxation and corporate governance – the state of the art. In: Schön, W. (Ed.) *Tax and Corporate Governance*. Springer-Verlag, Berlin Heidelberg.
- Gilders, F., Taylor, J., Richardson, G., Walpole, M., 2004. *Understanding Taxation Law: An Interactive Approach*, 2nd edn. LexisNexis Butterworths, Sydney, NSW.
- Government Accountability Office. 2005. *Tax Shelters: Services provided by External Auditors*. GAO, Washington, DC.
- Government Accountability Office. 2008. *Report to Congressional Requesters. International Taxation: Large US Corporations and Federal Contractors with Subsidiaries in Jurisdictions Listed as Tax Havens or Financial Privacy Jurisdictions*. GAO, Washington, DC.
- Graham, J.R., Tucker, A.L., 2006. Tax shelters and corporate debt policy. *Journal of Financial Economics* 81, 563-594.
- Green, P.J., Silverman, B.W., 1994. *Non-parametric Regression and Generalized Linear Models: A Roughness Penalty Approach*. Chapman and Hall, London, UK.
- Group of 100 Incorporated, 2003. *Guide to Compliance with ASX Principle 7: "Recognize and Manage Risk."* Group of 100 Incorporated, Melbourne, VIC.
- Gupta, S., Newberry, K., 1997. Determinants of the variability on corporate effective tax rates: evidence from longitudinal data. *Journal of Accounting and Public Policy* 16 (1), 1-34.
- Hair, J. F., Black, W.C., Babin, B.J., Anderson, R.E., Tatham, R.L., 2006. *Multivariate Data Analysis*, 6th Edn. Pearson Prentice-Hall, Upper Saddle River, NJ.
- Hanlon, M., Slemrod, J., 2009. What does tax aggressiveness signal? Evidence from stock price reactions to news about tax shelter involvement. *Journal of Public Economics* 93 (1/2), 126-141.
- Hartnett, D., 2008. The link between taxation and corporate governance. In: Schön, W. (Ed.), *Tax and Corporate Governance*. Springer-Verlag, Berlin Heidelberg.
- Henderson Global Investors, 2005. *Responsible Tax*. Henderson Global Investors, London, UK.

- Ibrahim, N., Howard, D., Angelidis, J., 2003. Board members in the service industry: An empirical examination of the relationship between corporate social responsibility orientation and director type. *Journal of Business Ethics*, 47, 393-401.
- Karamanou, I., Vafeas, N., 2005. The association between corporate boards, audit committees, and management earnings forecasts: an empirical analysis. *Journal of Accounting Research* 43, 453-486.
- Killaly, J., 2009. Assisting compliance and managing tax risks in the large market: understanding ATO approaches and perspectives. Speech to the Fifth Annual Corporate Tax Forum, Sydney, May 18, 2009. Available at: <http://www.ato.gov.au/content/00194163.htm>.
- Klein, A., 1998. Firm performance and board committee structure. *Journal of Law and Economics* 41, 137-165.
- Klein, A., 2002. Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics* 33, 375-400.
- KPMG, 2005. *Tax in the Boardroom*, KPMG, London, UK.
- Landolf, U., 2006. Tax and corporate responsibility. *International Tax Review* 29, 6-9.
- Lanis, R., Richardson, G., 2011. The effect of board of director composition on corporate tax aggressiveness. *Journal of Accounting and Public Policy* 30 (1), 50-70.
- Lanis, R., Richardson, G., 2012. Corporate social responsibility and tax aggressiveness: an empirical analysis. *Journal of Accounting and Public Policy* 31 (1), 86-108.
- Larcker, D., Richardson, S., 2004. Fees paid to audit firms, accrual choices, and corporate governance. *Journal of Accounting Research* 42, 625-658.
- Lassila, D.R., Omer, T.C., Shelley, M.K., Murphy-Smith, L., 2010. Do complexity, governance and auditor independence influence whether firms retain their auditors for tax services? *Journal of the American Taxation Association* 32 (1), 1-23.
- Lisowsky, P., 2010. Seeking shelter: empirically modeling tax shelters using financial statement data. *The Accounting review* 85 (5), 1693-1720.
- Manzon G., Plesko, G., 2002. The relation between financial and tax reporting measures of income. *Tax Law Review* 55, 175-214.
- Matsumura, E.M., Tucker, R.R., 1992. Fraud detection: a theoretical foundation. *The Accounting Review* 67 (4), 753-782.
- McGuire, S.T., Omer, T.C., Wang, D., 2012. Tax avoidance: does tax-specific industry expertise make a difference? *The Accounting Review* 87 (3), 975-1003.
- Mills, L., Erickson, M., Maydew, E., 1998. Investments in tax planning. *Journal of the American Tax Association* 20 (1), 1-20.
- Omer, T., Molloy, K., Ziebart, D., 1993. An investigation of the firm size-effective tax rate relation in the 1980s. *Journal of Accounting, Auditing and Finance* 8 (2), 167-182.
- Organization for Economic Cooperation and Development, 2006. *The OECD's Project on Harmful Tax Practices: 2006 update on progress in member countries*. Available at: <http://www.oecd.org/dataoecd/1/17/37446434.pdf>.
- Organization for Economic Cooperation and Development, 2009. *OECD Forum on Tax Administration, Information Note: General Administration Principles: Corporate Governance and Tax Risk Management*. Available at: [www.oecd.org/dataoecd/37/19/43239887.pdf](http://www.oecd.org/dataoecd/37/19/43239887.pdf).
- Parliament of Australia, 2006. *Parliamentary Joint Committee on Corporations and Financial Services, Corporate Responsibility: Managing Risk and Creating Value*. Senate Printing Unit, Canberra, ACT.
- Pearce, J.A., Zahra, S.A., 1991. The relative power of CEOs and board of directors: association with corporate performance. *Strategic Management Journal* 12, 135-53.
- Rae, K., Subramaniam, N., Sands, J., 2008. Risk management and ethical environment: effects on internal audit and accounting control procedures. *Journal of Applied Management Accounting Research*, 6 (1), 11-30.
- Rego, S.O., 2003. Tax-avoidance activities of US multinational corporations. *Contemporary Accounting Research* 20 (4), 805-833.
- Rego, S.O., Wilson, R., 2012. Equity risk incentives and corporate tax aggressiveness. *Journal of Accounting Research* 50 (3), 775-809.
- Rezaee, Z., 2005. Causes, consequences, and deterrence of financial statement fraud. *Critical Perspectives on Accounting* 16, 277-298.
- Richardson, G., Lanis, R., 2007. Determinants of the variability in corporate effective tax rates and tax reform: evidence from Australia. *Journal of Accounting and Public Policy* 26 (6), 689-704.
- Rose, J.M., 2007. Corporate directors and social responsibility: ethics versus shareholder value. *Journal of Business Ethics* 73, 319-331.

- Schön, W., 2008. Tax and corporate governance: a legal approach. In: Schön W. (Ed.) Tax and Corporate Governance. Springer-Verlag: Berlin Heidelberg.
- Securities and Exchange Commission, 2003. Strengthening the Commission's Requirements regarding Auditor Independence. SEC Final Rule S7-49-02. Securities and Exchange Commission, Washington, DC.
- Senate Joint Committee on Taxation, 2003. Report of the Investigation of Enron Corporation and Related Entities regarding Federal Tax and Compensation Issues, and Policy Recommendations. US Government Printing Office, Washington, DC.
- Senate Permanent Subcommittee on Investigations. 2005. The Role of Professional Firms in the US Tax Shelter Industry. US Government Printing Office, Washington, DC.
- Siegfried, J., 1972. The relationship between economic structure and the effect of political influence: empirical evidence from the federal corporation income tax program. Ph.D. dissertation, University of Wisconsin.
- Sikka, P., 2010. Smoke and mirrors: corporate social responsibility and tax avoidance. *Accounting Forum* 34, 153-168.
- Sikka, P., Hampton, M.P., 2005. The role of accountancy firms in tax avoidance: some evidence and issues. *Accounting Forum* 29, 325-343.
- Slemrod, J., 2004. The economics of corporate tax selfishness. *National Tax Journal* 57 (4), 877-899.
- Slemrod, J., 2007. Cheating ourselves: the economics of tax evasion. *Journal of Economic Perspectives* 21 (1), 25-48.
- Spira, L.F., Page, M., 2003. Risk management: the reinvention of internal control and the changing role of internal audit. *Accounting, Auditing & Accountability Journal* 16 (4), 640-661.
- Stickney, C., McGee, V., 1982. Effective corporate tax rates: the effect of size, capital intensity, leverage, and other factors. *Journal of Accounting and Public Policy* 1 (2), 125-152.
- Subramaniam, N., Ratnatunga, J., 2003. Corporate governance: some key challenges and opportunities for accounting researchers. *Journal of Applied Management Accounting Research* 1 (2), 1-8.
- The Economist. 1999. Rupert laid bare. Available at: <http://www.economist.com/node/319862>.
- Tran, A.V., 1997. The gap between accounting profit and taxable income. *Australian Tax Forum* 13 (4), 507-534.
- Uzun, H., Szewczyk, S.H., Varma, R., 2004. Board composition and corporate fraud. *Financial Analysts Journal* 60, 33-43.
- White, H.A., 1980. Heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *Econometrica* 48, 817-838.
- Wilcox, R., 2001. *Fundamentals of Modern Statistical Methods*. Springer, New York, NY.
- Williams, D.F., 2007. *Developing the concept of tax governance*. KPMG, London, UK.
- Wilson, R., 2009. An examination of corporate tax shelter participants. *The Accounting Review* 84 (3), 969-999.
- Yermack, D., 1996. Higher market valuation of companies with a small board of directors. *Journal of Financial Economics* 40, 185-211.
- Zahra, S., Pearce, J., 1989. Boards of directors and corporate financial performance: a review and integrative model. *Journal of Management* 15 (2), 291-334.
- Zhara, S., Stanton, W., 1988. The implications of board of directors' composition for corporate strategy and performance. *International Journal of Management* 5, 261-272.

## Appendix A

### Description of the Desai and Dharmapala (2006) method for calculating the BTG residual

Applying the Desai and Dharmapala (2006) method, taxable income is calculated as  $TI_{jt}$  = accounting income tax expense divided by the Australian statutory tax rate of 30%. The BTG is calculated by subtracting TI from pre-tax accounting income (AI):  $BTG_{jt} = AI_{jt} - TI_{jt}$ . The BTG is scaled by the beginning-of-period total assets. The sample is not restricted to firms with positive BTG as those firms with  $TI > AI$  can and do use carry-forward tax losses to reduce tax payable. Total accruals (TA) are calculated for each firm in each year using a measure of total accruals developed by Healy (1985).

Total accruals are considered to measure the earnings management component of BTG.

$$TA_{it} = EBEI_{it} - (CFO_{it} - EIDO_{it}) \quad (1)$$

where:

- i = firms 1–203;
- t = financial years 2006–2009;
- TA = total accruals;
- EBEI = income before extraordinary items;
- CFO = cash flows from operations; and
- EIDO = extraordinary items and discontinued operations from the statement of cash flows.

The following OLS regression is performed to account for the component of BTG attributable to earnings management:

$$BTG_{it} = \beta_1 TA_{it} + \mu_{it} + \varepsilon_{jt} \quad (2)$$

where:

- BTG = the book-tax gap scaled by beginning-of-year assets;
- TA = total accruals scaled by beginning-of-year assets;
- $\mu$  = the residual; and
- $\varepsilon$  = the error term.

The residual value of BTG is considered to reflect tax-aggressive activity (TA):  $TA_{it} = \mu_{it} + \varepsilon_{jt}$ .

Table 1  
Types of tax aggressive activities pursued by firms and number of firm-year observations in the sample

Types of tax aggressiveness	Number of firms	Relative frequency (%)	Firm-year observations				
			2006	2007	2008	2009	Total
Corporate restructuring	5	16.67	5	5	5	5	20
Deductibility of interest expenses	4	13.34	4	4	4	4	16
Asset disposals – capital gains tax	3	10.00	2	3	1	1	7
Deductibility of intellectual property	3	10.00	3	3	3	3	12
Deductibility of R&D expenses	3	10.00	1	1	2	3	7
Deductibility of tax losses	3	10.00	3	3	3	3	12
Offshore income tax exemption	3	10.00	3	3	3	2	11
Claiming of capital gains tax losses	2	6.67	1	1	2	1	5
Acquisition of dividend franking credits	1	3.33	1	0	0	0	1
Deductibility of bad debts	1	3.33	1	1	1	1	4
Deductibility of concession fees	1	3.33	1	0	0	0	1
Deductibility of pre-contract work expenses	1	3.33	1	1	1	1	4
Totals	30	100%	26	25	25	24	100

Note 1: The number of firm observations may vary slightly from year-to-year (i.e., from 2006–2009) due to the commencement and/or settlement of a tax dispute with the ATO within a specific year.

Table 2  
Descriptive statistics

Variable	N	Mean	Std. Dev.	Minimum	Median	Maximum
TAG	812	.123	.370	0	0	1
RMS	812	.849	.301	0	1	1
AUD	812	.847	.360	0	1	1
EAI	812	.284	.242	0	.232	.129
ACI	812	.887	.221	0	1	1
EQR	812	.192	.243	0	.137	.396
SIZE	812	20.225	1.956	12.235	20.274	25.281
LEV	812	.641	.223	.067	0.695	2.200
CINT	812	.484	.223	0	.416	.521
RDINT	812	.067	.374	0	0	.740
INVINT	812	.109	.284	0	.064	.740
FTH	812	.143	.350	0	0	1
MKTBK	812	3.768	9.554	1.253	2.496	6.721
ROA	812	.056	.140	-.243	.063	.352

Variable definitions: TAG = a dummy variable, coded 1 if the firm is subject to a tax dispute with the ATO concerning tax aggressiveness under the Australian tax legislation during the 2006–2009 sample period, otherwise 0; RMS = a dummy variable, coded 1 if the board establishes a formal risk management system and internal controls in the firm, and if the CEO and the CFO state to the board in writing that the risk management system and internal controls are operating effectively in all material respects, otherwise 0; AUD = a dummy variable, coded 1 if the firm uses a big-four external auditor, otherwise 0; EAI = non-audit fees divided by total audit fees; ACI = the number of independent audit committee members divided by the total number of audit committee members; EQR = the equity-based remuneration of key management personnel divided by the total remuneration of key management personnel; SIZE = the natural logarithm of total assets; LEV = long-term debt divided by total assets; CINT = net property, plant and equipment divided by total assets; RDINT = R&D expenditure divided by total assets; INVINT = inventory divided by total assets; FTH = a dummy variable, coded 1 if the firm has at least one subsidiary company incorporated in an OECD (2006) listed tax haven, otherwise 0; MKTBK = the market value of equity divided by the book value of equity; and ROA = pre-tax income divided by total assets.

Table 3

Pearson pairwise correlation results

	TAG	RMS	AUD	EAI	ACI	EQR	SIZE	LEV	CINT	RDINT	INVINT	FTH	MKTBK	ROA
TAG	1													
RMS	-.188***	1												
AUD	-.048	.111***	1											
EAI	.130***	.024	.199***	1										
ACI	-.108***	.012	.137***	.205***	1									
EQR	-.057*	-.01	-.062*	-.072**	-.149***	1								
SIZE	.165***	.027	.177***	.368***	.263***	-.068*	1							
LEV	.190***	-.045	.074**	.185***	.128***	-.184***	.469***	1						
CINT	.087**	-.132***	-.037	-.011	.050	-.035	.000	.000	1					
RDINT	.020	.000	.076**	.053	.001	.038	-.077**	-.080**	.001	1				
INVINT	-.001	.000	.086**	.064*	.080**	-.051	.073	.138***	-.080**	.000	1			
FTH	.198***	.000	.114***	.045	.000	.036	.389***	.123***	.000	.000	.000	1		
MKTBK	.012	.014	.006	-.003	.015	.004	-.007	.009	.032	.001	.009	.104***	1	
ROA	.139**	.066*	.058*	.217***	.139***	-.136***	.254***	.211***	.158***	-.104***	.104***	.000	.006	1

Variable definitions: See Table 1 for variable definitions.

N = 812 for all variables.

\*, \*\*, and \*\*\* indicate significance at the .10, .05, and .01 levels, respectively. The  $p$ -values are one-tailed for directional hypotheses and two-tailed otherwise.



Table 4  
Logit regression results

Variable	Predicted sign	
Intercept	?	8.174 (7.70)***
RMS	-	-.890 (-2.90)***
AUD	?	-.925 (-1.78)**
EAI	+	.014 (2.89)***
ACI	-	-.015 (-1.71)**
EQR	?	-.013 (-1.58)*
SIZE	+	.647 (6.22)***
LEV	+	.347 (3.71)***
CINT	+	.007 (1.61)**
RDINT	+	.014 (.55)
INVINT	-	-.094 (-.89)
FTH	+	.103 (.32)
MKTBK	?	.001 (.73)
ROA	?	.015 (1.30)*
INDSEC	?	YES
YEAR	?	YES
Pseudo R <sup>2</sup> (%)		30.71%
LR Chi <sup>2</sup>		146.38
(Two-tailed <i>p</i> -value)		(.01)
N		812

Variable definitions: INDSEC = industry sector dummy variable, coded 1 if the firm is represented in the particular GICS category, otherwise 0; YEAR = year dummy variable, coded 1 if the year falls within the specific year category, otherwise 0; and see Table 2 for other variable definitions.

\*, \*\*, and \*\*\* indicate significance at the .10, .05, and .01 levels, respectively. The *p*-values are one-tailed for directional hypotheses and two-tailed otherwise.

Note 1: Coefficient estimates with the *t*-statistics in parentheses. Standard errors are corrected using the White (1980) procedure.

Table 5  
Logit regression results – additional analysis

Variable	Predicted sign	
Intercept	?	9.906 (7.98)***
RMS	–	-.294 (-1.63)**
AUD	?	-.774 (-1.52*)
EAI	+	.013 (2.63)***
ACI	–	.024 (2.52)***
BODI	–	-.595 (-1.96)**
RMS*BODI	–	-.269 (-1.94)**
EQR	?	-.011 (-1.44)*
SIZE	+	.664 (6.24)***
LEV	+	.446 (3.74)***
CINT	+	.007 (1.49)*
RDINT	+	.005 (.18)
INVINT	–	-.035 (-.91)
FTH	+	.079 (.25)
MKTBK	?	.001 (.56)
ROA	?	.018 (1.49)*
INDSEC	?	YES
YEAR	?	YES
Pseudo R <sup>2</sup> (%)		31.57%
LR Chi <sup>2</sup>		147.56
(Two-tailed <i>p</i> -value)		(.01)
N		812

Variable definitions: BODI = a dummy variable, coded 1 if the firm has a board of directors which is largely (>70%) made-up of independent directors, otherwise 0; an interaction term computed by multiplying RMS by BODI; and see Table 2 and Table 4 for other variable definitions.

\*, \*\*, and \*\*\* indicate significance at the .10, .05, and .01 levels, respectively. The *p*-values are one-tailed for directional hypotheses and two-tailed otherwise.

Note 1: Coefficient estimates with the *t*-statistics in parentheses. Standard errors are corrected using the White (1980) procedure.

Table 6  
 OLS regression results (ETRs and BTG proxy measures of tax aggressiveness)

Variable	Predicted sign	Base regression model (Eq. 1)				Extended regression model (Eq. 2)			
		ETR1	ETR2	BTG1	BTG2	ETR1	ETR2	BTG1	BTG2
Intercept	?	.233 (3.29)***	.151 (2.73)***	8.26e+07 (3.62)***	.127 (2.74)***	.244 (3.40)***	.178 (2.03)**	8.52e+07 (3.73)***	.127 (2.63)***
RMS	-	-.038 (-1.64)**	-.013 (-.41)	-.069 (-1.76)**	-.060 (-2.04)**	-.065 (-2.35)***	-.068 (-1.96)**	-.055 (-1.72)**	-.059 (-1.34)*
AUD	?	-.087 (-3.24)***	-.107 (-4.00)***	-.046 (-1.46)*	-.012 (.37)	-.083 (-2.98)***	-.099 (-3.60)***	-.071 (-1.83)**	-.021 (-.60)
EAI	+	.115 (3.77)***	.084 (2.40)***	.020 (.59)	.011 (.43)	.114 (3.69)***	.081 (2.31)**	.013 (.39)	.016 (.58)
ACI	-	-.055 (-1.93)**	-.040 (-1.46)*	-.042 (-1.40)*	-.012 (-.29)	-.056 (-1.82)**	-.045 (-1.51)*	-.016 (-.49)	-.024 (-.58)
BODI	-					-.051 (-2.44)***	-.087 (-3.83)***	-.001 (-.03)	-.026 (-1.05)
RMS*BODI	-					-.096 (-1.82)**	-.168 (-1.69)**	-.136 (-1.29)*	-.112 (-1.37)*
EQR	?	-.052 (-2.49)***	-.089 (-3.90)***	-.002 (-.05)	-.024 (-.97)	-.075 (-1.81)**	-.194 (-1.81)**	-.062 (-.55)	-.107 (-1.43)*
SIZE	+	.151 (3.58)***	.112 (2.58)***	.218 (4.23)***	.151 (3.07)***	.148 (3.53)***	.107 (2.46)***	.225 (4.33)***	.155 (3.15)***
LEV	+	.089 (2.40)***	.129 (4.19)***	.050 (1.38)*	.089 (2.74)***	.092 (2.47)***	.135 (4.30)***	.051 (1.42)*	.087 (2.64)***
CINT	+	.057 (2.19)**	.080 (2.15)**	.023 (1.34)*	.027 (1.73)**	.060 (2.31)***	.086 (2.32)***	.022 (1.28)*	.025 (1.64)**
RDINT	+	.044 (2.77)***	.043 (2.14)**	.011 (.47)	-.004 (-.18)	.044 (2.68)***	.042 (2.05)**	.021 (.84)	.001 (.04)
INVINT	-	-.004 (-.03)	-.038 (-1.64)*	-.041 (-1.85)**	-.030 (-2.20)**	-.001 (-.09)	-.037 (-1.55)*	-.040 (-1.96)**	-.029 (-2.19)**
FTH	+	.090 (2.63)***	.009 (.24)	.126 (2.78)***	.040 (1.77)**	.091 (2.63)***	.011 (.28)	.124 (2.74)***	.040 (1.75)**
MKTBK	?	-.008 (-.37)	-.019 (-.43)	-.010 (-.39)	-.001 (-.01)	-.008 (-.39)	-.020 (-.46)	-.006 (-.25)	-.001 (-.05)
ROA	?	.242 (6.40)***	.275 (8.71)***	.396 (11.63)***	.397 (6.62)***	.441 (6.26)***	.274 (8.67)***	.384 (11.23)***	.584 (6.33)***
INDSEC	?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YEAR	?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Adj. R <sup>2</sup> (%)		36.44%	24.17%	19.90%	41.84%	36.35%	22.29%	20.09%	41.87%
F-value		57.69	25.56	10.18	25.72	53.72	24.06	9.69	23.86
(Two-tailed <i>p</i> value)		(.01)	(.01)	(.01)	(.01)	(.01)	(.01)	(.01)	(.01)
N		812	812	812	812	812	812	812	812

Variable definitions: ETR1 = income tax expense divided by pre-tax accounting income; ETR2 = cash taxes paid divided by pre-tax accounting income; BTG1 = pre-tax accounting income less taxable income (in which taxable income is computed as income tax expense divided by the statutory corporate tax rate of .30 using the method developed by Manzon and Plesko (2002); BTG2 = book-tax gap residual, calculated using the method developed by Desai and Dharmapala (2006); and see Table 2, Table 4 and Table 5 for other variable definitions.

\*, \*\*, and \*\*\* indicate significance at the .10, .05, and .01 levels, respectively. The *p*-values are one-tailed for directional hypotheses and two-tailed otherwise.

Note 1: Because higher ETRs represent a proxy measure of lower corporate tax aggressiveness, we transformed ETR1 and ETR2 by multiplying them by -1, to obtain increasing measures of tax aggressiveness for the sensitivity analysis.

Note 2: Coefficient estimates with the *t*-statistics in parentheses. Standard errors are corrected using the White (1980) procedure.