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# International Corporate Tax Avoidance Practices: Evidence from Australian Firms

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## Abstract

This paper examines the international corporate tax avoidance practices of publicly listed Australian firms. Based on a hand-collected sample of 203 publicly listed Australian firms over the 2006–2009 period (812 firm-years), our regression results indicate that there are several practices Australian firms use to aggressively reduce their tax liabilities. Specifically, we find that thin capitalization, transfer pricing, income shifting, multinationality, and tax haven utilization are significantly associated with tax avoidance. In fact, based on the magnitude and significance levels of the regression coefficients in our study, thin capitalization and transfer pricing represent the primary drivers of tax avoidance, whereas income shifting and tax haven utilization are less important. Finally, our additional regression results show that tax havens are likely to be used together with thin capitalization and transfer pricing to maximize international tax avoidance opportunities via the increased complexity of transactions carried out through tax havens.

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*Keywords:* International corporate tax avoidance; Thin capitalization; Transfer pricing; Income shifting; Multinational operations; Tax havens

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## 1. Introduction

International corporate tax avoidance<sup>2</sup> is entrenched within the corporate culture of many western economies (Braithwaite, 2005; Desai, Foley, & Hines, 2006; Rego, 2003; Slemrod, 2001). The practice involves taking advantage of gaps or loopholes in tax legislation to reduce corporate tax significantly (Braithwaite, 2005; Killaly, 2009). Moreover, international tax avoidance arrangements may be structured and included in a firm's overall commercial arrangements (Hamilton, Deutsch, & Raneri, 2001). We are thus motivated in this study to examine whether publicly listed Australian firms make use of opportunities, methods, and tools in relation to thin capitalization, transfer pricing, income shifting, multinational operations and tax haven incorporated entities to significantly avoid paying corporate taxes. We are further motivated to examine the corporate tax avoidance practices of publicly listed Australian firms due to the nature and extent of tax avoidance activity detected during Australian Taxation Office (ATO) audits of these firms. Over our study period from 2006 to 2009, the ATO (sometimes with other tax authorities) audited or reviewed the financial accounts of 35 out of our total of 203 (17.24%) sample firms. Our study provides some unique insights into how publicly listed Australian firms engage in corporate tax avoidance through international activities.

Tax authorities around the world have recognized that international tax avoidance has been contributing to a progressive erosion of tax revenue as evidenced by the decline in corporate effective tax rates (ETRs) and the increase in the number of firms reporting a zero tax liability (ATO, 2010). Some of the main reasons attributed to the zero reported tax liabilities of firms were the abuse of transfer pricing rules and the use of tax havens. For instance, the U.S. Government Accountability Office (GAO, 2008a) observed that over the 1998–2005 period, 24% of U.S. controlled corporations and 34% of foreign-controlled corporations reported zero tax liabilities. The major reasons behind the zero reported tax liabilities in the U.S. include the abuse of transfer pricing rules and the utilization of tax havens. The U.S. GAO (2008b) also found that in 2007, 83 out of the 100 largest publicly listed U.S. firms (83%) have subsidiaries in jurisdictions listed as tax havens.

In Australia, the flow of funds to and from tax havens is substantial. For example, in the period from 2005 to 2006, around AUD\$8.3 billion (AUD\$4.9 billion) flowed from (to) tax havens to (from) Australia, up from approximately AUD\$3.5 billion (AUD \$2.2 billion) in the 2002 year (ATO, 2010). Moreover, the ATO (2006) found that several Australian firms<sup>3</sup> with significant international dealings had relatively lower profits compared with their market capitalization using industry based comparisons, with amended tax assessments from ATO tax audits resulting in the recovery of in excess of AUD\$300 million of corporate taxes. Transfer pricing audits carried out by the ATO from

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<sup>2</sup> Consistent with existing accounting research (see, e.g., Frank et al., 2009; Chen, Chen, Cheng, & Shevlin, 2010; Lanis & Richardson, 2012), we define corporate tax avoidance as the downward management of taxable income through tax planning activities. However, we adopt a more aggressive stance with respect to this definition. It encompasses tax planning activities that are considered to be aggressive in that they are designed to actively reduce taxable income by exploiting uncertainties or variability in interpretation of the tax law, taking advantage of areas of the tax law that may fall into the gray area, undertaking arrangements or schemes designed to actively reduce tax liabilities in addition to activities that are illegal.

<sup>3</sup> Undisclosed by the ATO due to privacy constraints.

2001 to 2006 resulted in amended tax assessments of AUD\$1.33 billion, with an additional AUD\$1.25 billion in disallowed tax losses (ATO, 2006). Finally, a community perceptions survey undertaken by the ATO (2007) shows that it has largely been ineffective in mitigating corporate tax avoidance, especially in respect of the use of tax havens.<sup>4</sup>

News Corporation Ltd. provides an interesting case example of a large publicly listed Australian firm that has been under scrutiny by the ATO for its international tax avoidance activities. *The Economist* (1999) found that in the four years prior to June 30, 1998 the firm and its subsidiaries paid only AUD\$325 million in corporate taxes worldwide. However, in the same period, its consolidated pre-tax profit was AUD\$5.4 billion. Thus, News Corporation Ltd. paid an ETR of only around 6% (*The Economist*, 1999). More recently, the U.S. GAO (2008b) found that News Corporation Ltd. had more offshore subsidiaries than almost any other firm operating in the U.S.<sup>5</sup>

Based on a hand-collected sample of 203 publicly listed Australian firms over the 2006–2009 period (812 firm-years), our regression results show that there are several tax avoidance practices used by Australian firms to aggressively reduce their corporate tax liabilities. In particular, we find that thin capitalization, transfer pricing, income shifting, multinationality and tax haven utilization are significantly associated with corporate tax avoidance. Based on the magnitude and significance levels of the regression coefficients in our study, the use of thin capitalization and transfer pricing represents the key drivers of tax avoidance, while income shifting and tax haven utilization are less important. Finally, our additional regression results indicate that tax havens are likely to be used along with thin capitalization and transfer pricing. These augment international tax avoidance opportunities by means of the increased complexity of transactions undertaken via tax havens.

This study contributes to the literature in several ways. First, it extends recent research on international corporate tax avoidance practices of U.S. firms (see, e.g., Dyreng & Lindsey, 2009; Slemrod & Wilson, 2009). Only rarely does the literature examine international tax avoidance practices of Australian firms. Based on data on capital flows between Australian domiciled firms and foreign controlled subsidiaries by the ATO (2010), the evidence suggests that many Australian firms are proficient at international tax avoidance and engage in such activities regularly and persistently. Thus, it is important to gain an understanding of the key motivating factors and methods in the international context used by these corporations to minimize their tax liabilities. While recent U.S. literature has discussed similar tax avoidance methods, no study has examined concurrently the effects of thin capitalization, transfer pricing, income shifting, multinationality, and tax haven utilization on tax avoidance. Second, we use multiple measures of tax avoidance based on long-run ETRs and book-tax differences to collect evidence on tax avoidance activities. Extant literature tends to consider one method only,

<sup>4</sup> Moreover, the ATO's (2007) community perceptions survey also considered whether the ATO was effective in preventing tax avoidance by large firms. Of the respondents undertaking the survey, 4% strongly agreed, 33% agreed, 31% disagreed, 10% strongly disagreed and 23% were unsure. Finally, in terms of whether the ATO was effective in preventing firms using tax havens to avoid paying tax, 6% strongly agreed, 32% agreed, 23% disagreed, 6% strongly disagreed and 33% of the respondents were unsure.

<sup>5</sup> The GAO (2008b) noted that the firm had a total of 782 foreign subsidiaries of which 152 were located in tax havens (the most commonly represented being the British Virgin Islands with 62 and the Cayman Islands with 33).

such as ETRs or book-tax differences as a measure of tax avoidance, which may be flawed since tax avoidance activities may be variably reflected in each (or either) particular measure. Third, this study utilizes a novel measure of thin capitalization using a method statement contained in the Australian tax legislation. This provides an objective means to determine how firms' employ tax deductible debt to reduce corporate taxes. Use of the method statement in the Australian tax legislation together with reliance on accounting definitions of financial statement elements permits duplication of this tax legislation-based thin capitalization measure. Fourth, we also construct a unique measure of transfer pricing, again using attributes constantly emphasized in the ATO's audit programs to gauge the extent of corporate non-compliance with transfer pricing rules. Fifth, we use a novel measure of income shifting that considers elements contained in the accounting income-to-taxable income reconciliation statements. We use this method to assess the extent to which Australian firms shift income internationally. This measure has not been previously examined in the literature. Sixth, as our measures of thin capitalization, transfer pricing, and/or income shifting permit replication in other jurisdictions (e.g., Canada, New Zealand, the U.K. and the U.S.), we also provide a methodological contribution that extends beyond Australian corporate tax avoidance research. Finally, we consider the interaction effects between tax havens and thin capitalization, transfer pricing, and income shifting to determine whether these activities are used simultaneously for international corporate tax avoidance. To the best of our knowledge, such interaction effects have not been extensively researched in the extant literature.

The remainder of this paper is organized as follows: [Section 2](#) presents a brief review of the U.S. literature on the topic of corporate tax avoidance; [Section 3](#) develops our hypotheses; [Section 4](#) discusses the research design; [Section 5](#) summarizes and analyzes the empirical results. Finally, [Section 6](#) concludes the paper.

## 2. Literature review

[Slemrod \(2001\)](#) claims that multinational firms use a set of inter-related and globally-orientated tax planning methods to minimize corporate taxes. A foreign multinational firm's average tax rate is likely to reflect a mix of operations in both high tax rate jurisdictions and low tax rate jurisdictions. Differential tax rates may lead a firm to pursue tax avoidance strategies. Empirical support for [Slemrod's \(2001\)](#) claims is provided by [Rego \(2003\)](#) who examines the tax planning of U.S. multinational firms. She presents evidence that multinational firms with extensive foreign operations have lower worldwide ETRs. [Rego \(2003\)](#) argues that these results indicate economies of scale in tax planning. Additionally, [Mills and Newberry \(2004\)](#) find that the taxable income levels of U.S. foreign controlled firms tend to vary significantly according to the worldwide tax incentives of their foreign parents. Foreign multinational firms with relatively low foreign tax rates are found to have sourced more debt and reported less taxable income in their U.S. foreign controlled firms than those with relatively high foreign tax rates.

[Dyreng, Hanlon, and Maydew \(2008\)](#) find that industry, employee stock option intensity, leverage, firm size, and intangible assets are significant explanatory variables of the cross-sectional variation in long-run ETRs. Specifically, they find that firm size, earnings-to-price ratio, return on assets, leverage, R&D and advertising expenditure are significantly associated

with long-run ETRs. Dyreng, Hanlon, and Maydew (2010) also observe that corporate executives have a major impact on the level of tax avoidance across firms, not because of their direct influence on the tax function per se, but by setting the tone at the top of the organization. Corporate culture and managerial behavior may influence the extent and nature of corporate tax avoidance (Dyreng et al., 2010).

Frank, Lynch, and Rego (2009) find a strong positive association between tax aggressiveness and financial reporting aggressiveness for U.S. firms. Specifically, firms engaging in earnings management of taxable profits and financial profits concurrently managed book income upwards (aggressive financial reporting) and taxable income downwards (aggressive tax reporting) in the same reporting period. Book-tax differentials and the aggressive use of tax shelters by firms provide evidence of the connection between tax and financial reporting (Frank et al., 2009).

Based on this brief outline of recent U.S. literature, we see some major income tax implications arising from a firm's financing strategy and procedures. For example, a firm may undertake debt financing both domestically and internationally to fund its business operations, so tax strategy can have a major impact on financial reporting in the public domain. Financial accounting and tax management are interdependent. Tax planning matters drive financial accounting choices and corporate tax avoidance strategies and they often result in lower reported income (Shackelford & Shevlin, 2001; Shackelford, Slemrod, & Sallee, 2007).

### 3. Hypotheses development

We now develop several hypotheses regarding the impact of thin capitalization, transfer pricing, income shifting, multinationality, and tax haven utilization on corporate tax avoidance.

#### 3.1. Thin capitalization

Australia's thin capitalization rules, which are contained in the *Income Tax Assessment Act 1997* (ITAA97),<sup>6</sup> apply to firms whose assets are funded by a high level of debt and a relatively low level of equity in their capital structure. The thin capitalization rules document the process by which firms can calculate the maximum amount of interest bearing debt that can give rise to interest deductions in a year of income, known as the "maximum allowable debt."<sup>7</sup> A thinly capitalized firm has a level of debt in its capital structure that exceeds 75% of the total of its debt plus equity. This is known as the "safe harbor limit." The thin capitalization rules in ITAA97 require compliance with accounting standards, both in terms of determining the firm's assets and liabilities, and in valuing the firm's assets, liabilities,

<sup>6</sup> See Division 820 of ITAA97.

<sup>7</sup> The fixed safe harbor gearing ratio is adopted as the first tier test and if exceeded, an arm's length test or test based on worldwide gearing limit is then applied. Firms (including associated firms) that claim debt deductions of less than AUD\$250,000 or have 90% or more of the value of its assets represented by Australian assets (Division 820 of ITAA97), or have their operations confined entirely within Australia or entirely outside Australia, are excluded from application of the thin capitalization provisions. Determination of the maximum allowable debt using the arm's length test or worldwide gearing ratio is not determined from the annual reports as these methods are reliant on firm specific assumptions and factors not necessarily discussed in those reports.

debt, and equity capital.<sup>8</sup> Firms with debt levels close to or even well within the safe harbor limit, but in excess of the industry standard may indicate tax avoidance.

It is expected that firms with higher debt-to-equity ratios will tend to be more efficient at minimizing group income taxes. Indeed, Walsh and Ryan (1997) find that U.K. firms frequently issue debt from foreign finance subsidiaries, particularly in favorable tax jurisdictions such as the Netherlands, to avoid paying interest withholding tax and to achieve tax deductibility of interest payments. Arbitrage activities of this kind demonstrate the connection between a firm's strategies and its financing and tax decisions. Rego (2003) also finds that higher-levered U.S. firms have lower ETRs as these firms employ debt deductions to reduce the amount of corporate tax payable and also record lower tax provisions in the financial accounts. In fact, a multinational firm has an incentive to finance its foreign direct investment with debt if the host-country's corporate income tax rate is higher than that of the home-country's corporate tax rate. In these cases, the firm will be able to deduct its interest payments at a higher rate if the borrowing is carried out by a foreign subsidiary rather than by the parent firm (Dahlby, 2008). Finally, Dyreng et al. (2008) find that successful long-run tax avoidance is significantly associated with higher leverage for U.S. firms.

To formally test the impact of thin capitalization structure on corporate tax avoidance, we develop the following (directional) hypothesis:

**H1.** All else being equal, a firm's thin capitalization position is positively associated with corporate tax avoidance.

### 3.2. *Transfer pricing*

Desai et al. (2006) emphasize that transactions between related parties located in variably taxed jurisdictions offer considerable opportunities to engage in international tax avoidance. Multinational firms can structure and price payments and intra-firm trade in order to facilitate tax avoidance, particularly by strategically setting artificial inter-company transfer prices. The concept of "comparability" is pivotal to the operation of the arm's length principle in many jurisdictions (Hamilton et al., 2001). Therefore, an important tax compliance problem is that many firms do not have sufficient documentation of how they establish arm's length inter-company transfer prices. Non-compliance may be reflected in poor disclosure of related-party transactions in the financial accounts and the divergent treatment of international business transactions by the firm generally (Arnold & McIntyre, 2002).

The purpose of Australia's transfer pricing rules contained in the *Income Tax Assessment Act 1936* (ITAA36)<sup>9</sup> is to ensure that international related-party transactions are conducted on an "arm's length basis" so profits are not shifted to the most favorable tax jurisdiction to minimize the firm's overall tax liability (Hamilton et al., 2001). Moreover, the lack of documentation also raises the concern of the ATO and may lead to amended tax assessments being issued to the firm due to transfer pricing audits (ATO, 2006).

<sup>8</sup> See *Taxation Ruling TR 2002/20* for a detailed discussion of Australia's thin capitalization rules.

<sup>9</sup> See Division 13 of ITAA36.



Shackelford et al. (2007) contend that more complex transfer pricing arrangements involve the use of intangible assets (e.g., R&D expenditure), where it is difficult to establish a value and taxable income can be easily transferred internationally. In fact, they argue that tax avoidance opportunities for transfer pricing are the greatest among multinational firms that have high profit margins generated from intangible assets in the pharmaceutical industry.

To formally test the impact of transfer pricing on corporate tax avoidance, we develop the following (directional) hypothesis:

**H2.** All else being equal, a firm's aggressive transfer pricing activity is positively associated with corporate tax avoidance.

### 3.3. *Income shifting*

Grubert and Mutti (1991) provide evidence that U.S. multinational firms report more income (as a percentage of sales or shareholders' equity) in low tax jurisdictions compared with high tax jurisdictions. Moreover, Klassen, Lang, and Wolfson (1993) find that income shifting to/from the U.S. is economically significant due to tax rate differentials between countries where group entities are domiciled. In fact, Klassen et al. (1993) document that income shifting as a result of tax rate changes relative to those in the U.S. in the 1980s was approximately 10%–20% of income to/from U.S. firms. Finally, Collins, Kemsley, and Lang (1998) observe that U.S. multinational firms that face average foreign corporate tax rates in excess of the U.S. corporate tax rate exhibit more extensive tax avoidance behavior compared to other U.S. firms.

International income shifting is undertaken by Australian firms to significantly reduce the amount of domestic corporate tax payable (Eldenburg, Pickering, & Yu, 2003).<sup>10</sup> Specifically, differential profit margins between Australian domiciled and foreign domiciled subsidiaries can provide an opportunity to shift income internationally (Hamilton et al., 2001). For instance, higher profit margins made by Australian firms on higher taxed foreign operations motivate firms to shift income to lower tax jurisdictions to minimize the overall corporate tax liability of the firm (Eldenburg et al., 2003).

An adjustment to income tax expense on pre-tax accounting profit is required because of the tax rate differential on non-Australian income earned by overseas domiciled subsidiaries of Australian firms (see, e.g., Huizinga & Laeven, 2008).<sup>11</sup> When firms have large absolute adjustments to income tax expense on accounting profit due to net differential foreign tax rates, they likely have more opportunities to engage in income shifting and thus corporate tax avoidance. Larger adjustments reflect greater net tax rate differentials among group subsidiaries and thus provide greater incentives for firms to shift profits (Huizinga & Laeven, 2008).

<sup>10</sup> See Divisions 4, 6 and 8 of ITAA97.

<sup>11</sup> Adjustments to income tax expense on accounting profit are provided in the accounting income-to-taxable income reconciliation statement in the notes to the financial accounts in the annual report.

To formally test the impact of income shifting exposure on corporate tax avoidance, we develop the following (directional) hypothesis:

**H3.** All else being equal, a firm's income shifting activity is positively associated with corporate tax avoidance.

### 3.4. *Multinationality*

Australia's tax legislation is based on the principle that resident taxpayers are subject to Australian tax on their gross income from all sources, both inside and outside of Australia.<sup>12</sup> However, there are also specific tax provisions that cover international corporate dealings. For Australian resident firms deriving foreign-sourced income, several tax implications are relevant. For example, related firms can take advantage of their group operating structure and tax differentials across jurisdictions to shift income between group members, which minimize the overall tax liability of the corporate group (Beuselinck, Buyschaert, & Deloof, 2005).

Given that multinational firms generally apply efficient tax planning across group entities, it is possible that firms with subsidiaries in the corporate group that derive income from foreign sources may engage in greater tax avoidance activities. Hanlon, Mills, and Slemrod (2007) report that foreign controlled firms have more than double the levels of tax non-compliance relative to domestic controlled firms. Finally, Rego (2003) and Dyreng et al. (2008) find that firms with greater international exposure have more opportunities to engage in tax avoidance activities.

To formally test the impact of multinational operations on corporate tax avoidance, we develop the following (directional) hypothesis:

**H4.** All else being equal, the extent of a firm's multinational operations is positively associated with corporate tax avoidance.

### 3.5. *Tax haven utilization*

Corporate tax avoidance may also be facilitated if members of the corporate group are residents of countries with tax haven status<sup>13</sup> that offer beneficial taxation, financial, and legal regimes (ATO, 2004; OECD, 2006). Tax havens may impose no taxes or nominal corporate taxes, have laws or administrative practices which prevent the effective exchange of information between tax authorities and lack transparency on financial and tax arrangements including regulatory, legal, and administrative provisions and access to financial records (OECD, 2006). Tax havens also promote corporate tax avoidance by permitting the reallocation of taxable income to low-tax jurisdictions and by reducing the amount of domestic taxes paid on foreign income (Desai et al., 2006).

<sup>12</sup> See Section 6-5 of ITAA97.

<sup>13</sup> The Organisation for Economic Cooperation and Development (OECD) identifies three key factors in considering whether a jurisdiction is a tax haven: (1) no taxes or nominal taxes; (2) lack of effective exchange of information; and (3) lack of transparency. The OECD (2006) recognizes a total of 33 tax havens around the world. The OECD's (2006) complete list of 33 tax havens is reported in Appendix A.



Desai et al. (2006) argue that one of the main objectives of large tax havens is to reallocate taxable income, whereas small tax havens are used to defer the amount of domestic taxes on foreign income. It is thus likely that tax aggressive firms will incorporate subsidiaries in tax havens to avoid having their foreign income subject to domestic corporate taxes (Desai et al., 2006).<sup>14</sup> Firms may also exploit the secrecy laws and lack of transparency of tax havens in an attempt to conceal assets and income that may be subject to tax in Australia (OECD, 2006). In fact, Harris, Morck, Slemrod, and Yeung (1993) find that U.S. tax liabilities as a percentage of U.S. sales or assets were lower for a sample of 95 U.S. multinational firms with a legal presence in a tax haven.<sup>15</sup>

Firms incorporated in a country with tax haven status may play an important role for the entire corporate group. For example, firms incorporated in a tax haven may control treasury, insurance, business, and service functions for the corporate group. They may also facilitate the tax efficient transfer of funds between members of the corporate group. Thus, efficient tax planning across group entities involving firms incorporated in a tax haven could have a major impact on the transparency and accountability of the entire corporate group (ATO, 2004). The lack of transparency and accountability at the corporate group level may in turn influence the corporate mindset on issues such as the provision of information to tax authorities.

To formally test the impact of tax haven utilization on corporate tax avoidance, we develop the following (directional) hypothesis:

**H5.** All else being equal, a firm's use of a tax haven incorporated subsidiary is positively associated with corporate tax avoidance.

## 4. Research design

### 4.1. Sample selection and data source

This study examines the international corporate tax avoidance practices of the top 300 ASX listed firms over the financial reporting period 2006–2009. We chose these four years because they represent the most recent years of publicly available data. We applied the following criteria in selecting our sample firms: (1) consecutive financial data must be available for the 2006–2009 period; and (2) firms must have had a continuous listing on the Australian Stock Exchange (ASX) over the 2006–2009 period.

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<sup>14</sup> However, it is also possible that controlled entities incorporated in tax havens may be established for legitimate business purposes and/or because they represent the lower taxed location of several possible locations in which that business could be conducted. Yet, transparency of information relating to these transactions is lacking (ATO, 2004).

<sup>15</sup> We should note that not all empirical research on tax havens shows that they achieve lower taxes for firms that have tax haven affiliates. For example, Dyreng and Lindsey (2009) examine the tax rate differences applied to global, domestic, and foreign tax rates for U.S. corporate groups with and without tax haven incorporated entities. While global tax rates were incrementally reduced from 36% to 34.5% on average for U.S. firms with at least one foreign operation located in a tax haven, they found that many of these firms with tax haven links were associated with high domestic U.S. tax rates on foreign income.

Our initial sample comprised the top 300 ASX listed firms. However, this was reduced to 203 firms after excluding: financial firms (39); insurance firms (11); U.S. GAAP reporting firms (16); property partnership or trust entities (11); and newly incorporated firms or firms that were taken-over or merged with other firms (20). Overall, 812 firm-year observations were available for empirical testing. Finally, tax and financial accounting data were hand collected from the annual reports to obtain relevant data for the measurement of our variables, not all of which are available in electronic form in public databases.

#### *4.2. Dependent variable*

To improve the robustness of our results, we employ several measures of corporate tax avoidance that have been used in the extant literature as the dependent variable (see, e.g., [Manzon & Plesko, 2002](#); [Desai & Dharmapala, 2006](#); [Dyreg et al., 2008](#)) and/or emphasized by the [ATO \(2006\)](#) as a tax risk in their various tax compliance programs. Specifically, we employ long-run ETRs and book-tax gaps (BTG) as our measures of corporate tax avoidance. Each variable reflects tax planning that reduces a firm's tax liability without necessarily reducing accounting income.

Our first measure of corporate tax avoidance (LRETR1) is calculated as the sum of tax expense (comprising both current and deferred tax expense) over the 2006–2009 period divided by the sum of pre-tax accounting income over that same period. The second measure of tax avoidance (LRETR2) is calculated as the sum of cash tax paid over the 2006–2009 period divided by the sum of pre-tax accounting income over that same period. We use long-run (four year) measures of both accounting and cash ETRs because of the potential for significant variation in annual ETRs that may obscure indications of tax avoidance ([Dyreg et al., 2008](#)). Furthermore, a disadvantage of using accounting tax expense is that it comprises current tax and deferred tax expenses, and the latter may be the result of large deferred tax adjustments ([Hanlon, 2005](#)). [Dyreg et al. \(2008\)](#) measure ETRs as the average of accounting tax expense divided by pre-tax income over five- and ten-year periods to measure the average tax liability of the firm. Negative measures of LRETR1 and LRETR2 relate to the presence of income tax refunds or benefits, so if a firm received an income tax refund in a given year, the LRETR measures was set at zero, in keeping with [Dyreg et al. \(2008\)](#).

The BTG (or book-tax differences) has been proposed as a measure of both earnings management and corporate tax avoidance ([Graham, Raedy, & Shackelford, 2012](#)). Firms that are relatively successful at tax avoidance are likely, although not necessarily able, to sustain large differences between accounting income and taxable income ([Alexander, Ettredge, Stone, & Sun, 2008](#); [Dyreg et al., 2008](#); [Frank et al., 2009](#); [Rego & Wilson, 2009](#)). Transactions can be structured to generate large temporary or permanent differences in accounting income and taxable income. For instance, the use of R&D tax credits can lead to permanent book-tax differences. Our third measure of corporate tax avoidance (BTAX1) involves an assessment of the raw book-tax gap in line with [Manzon and Plesko \(2002\)](#), calculated as pre-tax accounting income less taxable income, scaled by lagged total assets. Taxable income is computed as tax expense divided by the corporate statutory tax rate of 30%. Our fourth measure of tax avoidance (BTAX2) is calculated as the BTG

residual using the method developed by Desai and Dharmapala (2006).<sup>16</sup> They argue that the BTG may result from earnings management activities in which income is adjusted to avoid reporting losses to achieve performance benchmarks or remuneration based objectives, rather than to reflect increased levels of tax avoidance. We adjust BTG in the same way as Desai and Dharmapala (2006) do to control for earnings management activities that could be responsible for the gap.<sup>17</sup> In particular, the component of BTG attributable to earnings management is removed to leave a residual value that is inferred to measure corporate tax avoidance (Desai & Dharmapala, 2006).

#### 4.3. Independent variables

Thin capitalization, transfer pricing, income shifting, multinationality, and tax haven utilization represent our independent variables. Although thin capitalization, transfer pricing, and income shifting are inter-related in that they all involve the transfer of income or debt to the most favorable tax jurisdiction, we develop unique measures for each of these variables. We calculate all independent variables, including transfer pricing and thin capitalization, using publicly available data from the consolidated financial statements and notes in annual reports.

We use the method statement contained in the Australian tax legislation to calculate a firm's thin capitalization position.<sup>18</sup> While the thin capitalization rules are based on a method statement, we rely on the accounting definition of financial statement elements to determine the quantum of assets, liabilities, and equity for the purpose of calculating a firm's thin capitalization position. In accordance with the method statement, all assets and liabilities of the consolidated entity need to be valued to calculate a firm's thin capitalization position correctly. Specifically, we calculate a firm's thin capitalization position using the safe harbor test.<sup>19</sup> This test involves calculation of a safe harbor debt amount (SHDA) using the method statement outlined in ITAA97. The SHDA is 75% of the average asset value of Australian operations, net of non-interest bearing liabilities and investments in associates. Proxy measures for each of the variables used to calculate the SHDA are employed as follows:

$$\text{SHDA} = (\text{Average Total Assets} - \text{non-IBL}) \times 75\% \quad (1)$$

where:

non-IBL non-interest bearing liabilities.

<sup>16</sup> A description of the method developed by Desai and Dharmapala (2006) for calculating the BTG residual is provided in Appendix B.

<sup>17</sup> Specifically, an adjustment to realized cash flows that is used in computing a firm's net income.

<sup>18</sup> The method statement provided in section 820-95 of ITAA97 is summarized in Appendix C.

<sup>19</sup> Determination of the maximum allowable debt using the arm's length test or worldwide gearing ratio will not be made as these methods are reliant on firm specific assumptions and factors.

A proxy measure of average debt is computed as follows:

$$\text{Average Debt} = \text{Total interest bearing liabilities (IBL)}. \quad (2)$$

A proxy measure of maximum allowable debt is thereafter calculated as follows:

$$\text{Maximum Allowable Debt (MAD) ratio} = \text{Average Debt / SHDA}. \quad (3)$$

Firms with a MAD ratio in excess of one are potentially non-compliant with the thin capitalization rules contained in ITAA97 (ATO, 2005a). While firms may be compliant with the thin capitalization rules if the MAD is less than one, changes in business conditions or the way one measures financial statement elements can result in a firm having a MAD ratio close to the upper limit of one. We use the MAD ratio as the basis of our measure of thin capitalization (TCAP). Specifically, TCAP is measured as a dummy variable of 1 if the firm has a MAD ratio greater than one, otherwise it is 0.

We develop a proxy measure of non-compliance with the transfer pricing rules based on eight different items, each of which is scored as 1 if present and 0 otherwise.<sup>20</sup> A transfer pricing index (TPRICE) was constructed based on the sum of the eight items divided by eight. These items were chosen as representative of aggressive transfer pricing activity as they all involve intra-entity transfers that are not commercially justified as per the ATO and Australian Securities and Investment Commission (ASIC) guidelines and regulations. The ATO and ASIC have targeted tax avoidance schemes or schemes that are non-compliant with the *Corporations Act 2001*. These schemes involve each of these eight items because the ATO and ASIC consider them high risk because they result in transfer of benefits to related party firms without commercial justification (ASIC, 2010; ATO, 2005b).<sup>21</sup> Australian firms that engage in international dealings with related parties are required to complete a Schedule 25A form and lodge it with their income tax return. Schedule 25A imposes obligations on firms to disclose information about their related party international dealings.<sup>22</sup> These items are considered risky elements in relation to transfer pricing and therefore are included in TPRICE.

As part of its compliance program, the ATO (2005b) examined the transfer of loans between group members that are then forgiven without any commercial justification, and have a net result of a tax benefit. Similarly, ASIC (2010) has investigated the forgiveness of debt between the firm, key management personnel, and related parties. Moreover, disclosure of transfers of loans, services, payments, and assets between related parties and related party benefits requires commercial justification for the transfers and material impacts of related party transactions on financial statements in accordance with *AASB 124*

<sup>20</sup> The eight items which comprise the transfer pricing score are reported in Appendix D. All of the coding for this variable was undertaken by one author only within a four-month period, eliminating potential for bias or differences in coding due to subjectivity.

<sup>21</sup> Refer to Appendix D for a discussion of the elements of related party transactions which can be considered as evidence of lack of commercial justification.

<sup>22</sup> The Schedule 25 items include: (1) the nature and amount of certain categories of transactions; (2) details of interest-free loans; (3) receipts or payments of non-monetary consideration; (4) details of arms-length methodologies used; (5) the level of documentation held to support the selection and application of the most appropriate arm's length methodologies; and (6) details of disposals of any interest in a capital asset (ATO, 2005b).

*Related Party Disclosures* (AASB, 2008).<sup>23</sup> This information was derived from publicly available information within annual reports.

We also develop a proxy measure of income shifting (INCS). An adjustment to income tax expense on pre-tax accounting profit is often required because of tax rate differentials on non-Australian income earned by overseas domiciled subsidiaries. This adjustment is positive where net tax paid on foreign income in the current period is less than the Australian corporate tax rate of 30%, necessitating an increase to *prima facie* income tax expense on accounting profit. Conversely, this adjustment is negative where net tax paid on foreign income in the current period is greater than the Australian corporate tax rate of 30%, requiring a reduction to *prima facie* income tax expense on accounting profit. Our measure of income shifting is based on whether the firm had a negative adjustment to *prima facie* income tax expense on accounting profit. This measure reflects higher tax rates applied to foreign sourced income relative to that sourced in Australia and thus indicates the incentive and opportunity to shift income to the lower taxed Australian jurisdiction. INCS is a dummy variable scored as 1 if the firm has made a negative adjustment to *prima facie* income tax expense on pre-tax accounting profit due to differences between foreign corporate tax rates, otherwise it is 0. We focus on negative adjustments to *prima facie* income tax expense (as opposed to positive adjustments or both negative/positive adjustments) because shifting of profits to Australia is likely as a vast majority of parent entities are domiciled in Australia. INCS is based on [Huizinga and Laeven \(2008\)](#) and [Markle \(2011\)](#) who claim that a multinational firm's profit shifting capacity and incentive depends on the weighted average of international corporate tax rate differentials between all countries in which the firm operates. Our measure of INCS incorporates both the opportunity to avoid taxes based on relative tax rates among different jurisdictions in which the firm is operating, and includes the activity of shifting income to a jurisdiction that will generate some form of tax benefit.

We measure the extent of multinational operations (MULTI) as the proportion of total foreign sourced income divided by total income in line with previous empirical research by [Rego \(2003\)](#) and [Mills and Newberry \(2004\)](#).

Finally, our measure of tax haven utilization (THAV) is based on the [OECD's \(2006\)](#) list of 33 tax havens, as reported in [Appendix A](#). THAV is a dummy variable scored as 1 if the firm has at least one subsidiary firm incorporated in a tax haven during the financial reporting period 2006–2009, otherwise it is 0.<sup>24</sup> The use of a dummy variable to measure the existence of foreign operations for firms based on tax havens has been applied in previous research by [Desai et al. \(2006\)](#) and [Dharmapala and Hines \(2009\)](#).

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<sup>23</sup> In accordance with AASB 124, if there have been transactions between related parties, an entity is required to disclose the nature of the related party relationship, terms and conditions of transactions, outstanding balances, and the potential effects on the financial statements ([AASB, 2008](#), Para. 17).

<sup>24</sup> Other methods of measuring THAV were incorporated in our regression models, such as the proportion of tax haven incorporated subsidiaries. Results were not significant. In the case of the small-to-medium sized firms (e.g., firms with less than AUD\$600 million total assets at year end), tax avoidance may be assisted greatly through the use of only one tax haven, especially if that tax haven provides a treasury function or is the financing entity for the group. Our sample comprises approximately 34% of firms that can be regarded as small-to-medium in size.

#### 4.4. Control variables

Our study includes several control variables relating to firm size, leverage, capital intensity, inventory intensity, R&D intensity, return on assets, and industry sector and year effects.

Firm size (SIZE) controls for the impact of the size of the firm on corporate tax avoidance. Previous research on SIZE and ETRs has produced conflicting results (e.g., Gupta & Newberry, 1997; Porcano, 1986; Zimmerman, 1983), so no sign prediction is made for SIZE. We measure SIZE as the natural logarithm of total assets.

Leverage (LEV) is also included as a control variable because we expect that firms with higher debt-to-equity ratios are more efficient at minimizing corporate taxes (e.g., Lanis & Richardson, 2012; Rego, 2003). Leverage (LEV) is measured as the natural log of long-term debt divided by total assets.

Capital intensity (CINT) and inventory intensity (INVINT) are included as control variables for high capital intensive or inventory intensive firms, respectively (Stickney and McGee, 1982). CINT is negatively associated with ETRs due to accelerated depreciation charges based on asset lives. Moreover, to the extent that INVINT is a substitute for CINT, inventory intensive firms should be less tax avoidant than capital intensive firms, so INVINT is positively associated with ETRs. We measure CINT as net property, plant, and equipment divided by lagged total assets, and INVINT as inventory divided by lagged total assets. We also include R&D intensity (RDINT) as a control variable as previous research (e.g., Gupta & Newberry, 1997) finds that RDINT is negatively associated with ETRs due to the tax-deductible nature of R&D expenditure. We measure RDINT as R&D expenditure divided by lagged total assets.

Return on assets (ROA) is included in our study to control for operating performance and the variability in firm performance. We expect a positive association between ROA and ETRs (e.g., Richardson & Lanis, 2007). ROA is measured as pre-tax profit divided by total assets.

Industry-sector (INDSEC) dummy variables defined at the two-digit GICS code level are included as control variables because it is possible for corporate tax avoidance to fluctuate across industry sectors (e.g., Omer, Molloy, & Ziebart, 1993). No sign predictions are made for the INDSEC dummies.

Finally, year (YEAR) dummy variables are included in our regression model to control for differences in corporate tax avoidance activities that could possibly exist over the 2006–2009 sample years. No sign predictions are made for the YEAR dummies.

#### 4.5. Base regression model

Our base ordinary least squares (OLS) regression model is estimated as follows:

$$\begin{aligned}
 TA_{it} = & \alpha_{0it} + \beta_1 TCAP_{it} + \beta_2 TPRICE_{it} + \beta_3 INCS_{it} + \beta_4 MULTI_{it} + \beta_5 THAV_{it} + \beta_6 SIZE_{it} \\
 & + \beta_7 LEV_{it} + \beta_8 CINT_{it} + \beta_9 INVINT_{it} + \beta_{10} RDINT_{it} + \beta_{11} ROA_{it} + \beta_{12-19} INDSEC_{it} \\
 & + \beta_{20-22} YEAR_{it} + \varepsilon_{it}
 \end{aligned} \quad (4)$$

where:

i firms 1 through 203;



t	financial years 2006–2009;
TA	tax avoidance proxy measures (LRETR1, LRETR2, BTAX1, and BTAX2);
TCAP	a dummy variable of 1 if the firm has a MAD ratio greater than one, otherwise it is 0;
TPRICE	transfer pricing index of the firm based on the sum of eight different transfer pricing items divided by eight;
INCS	a dummy variable of 1 if the firm has made a negative adjustment to <i>prima facie</i> income tax expense on pre-tax accounting profit due to differences between foreign corporate tax rates, otherwise it is 0;
MULTI	total foreign sourced income divided by total income;
THAV	a dummy variable of 1 if the firm has at least one subsidiary firm incorporated in a tax haven, otherwise it is 0;
SIZE	the natural logarithm of total assets;
LEV	long-term debt divided by total assets;
CINT	net property, plant and equipment divided by lagged total assets;
INVINT	inventory divided by lagged total assets;
RDINT	R&D expenditure divided by lagged total assets;
ROA	pre-tax income divided by total assets;
INDSEC	industry sector dummy variable of 1 if the firm is represented in the specific GICS category, otherwise it is 0;
YEAR	year dummy variable of 1 if the year falls within the specific year category, otherwise it is 0; and
$\varepsilon$	the error term

## 5. Empirical results

### 5.1. Descriptive statistics

Table 1 reports the descriptive statistics for the dependent variables (LRETR1, LRETR2, BTAX1, and BTAX2), independent variables (TCAP, TPRICE, INCS, MULTI, and THAV), and control variables (SIZE, LEV, CINT, INVINT, RDINT, and ROA). The dependent variables LRETR1, LRETR2, BTAX1, and BTAX2 have a mean (standard deviation) of 0.199 (0.356), 0.171 (0.410), 0.297 (0.247), and 0.040 (0.089), respectively. These data show an acceptable level of corporate tax avoidance attributes. TCAP has a mean (standard deviation) of .434 (.376). Firms with a TCAP score exceeding 1 are potentially in breach of the thin capitalization provisions. The range in TCAP values from 0 to 1.496 indicates that there is substantial diversity in the quantum of assets, interest bearing, and non-interest bearing liabilities of the sample firms. TPRICE has a mean (standard deviation) of .266 (.145). THAV has a mean (standard deviation) of .143 (.350). Of note is that, on average, 14.3% of firms in our sample have a subsidiary incorporated in a tax haven. The mean, standard deviation, median, and range of other independent and control variables are also presented in Table 1. Finally, an acceptable range of variation is observed for all variables, and

Table 1  
Descriptive statistics.

Variable	N	Mean	Std. Dev.	Minimum	Median	Maximum
LRETR1	812	.199	.356	0	.265	1
LRETR2	812	.171	.410	0	.220	1
BTAX1	812	.029	.247	–.649	.001	.316
BTAX2	812	.040	.089	–.115	.052	.196
TCAP	812	.434	.376	0	.419	1.496
TPRICE	812	.266	.145	0	.25	.75
INCS	812	.205	.404	0	0	1
MULTI	812	.256	.350	0	.007	.647
THAV	812	.143	.350	0	0	1
SIZE	812	20.225	1.956	12.235	20.274	25.281
LEV	812	.463	.324	.453	.482	1
CINT	812	.128	.499	0	.053	.958
INVINT	812	.153	.538	0	.080	1
RDINT	812	.006	.056	0	0	.138
ROA	812	.056	.140	–.243	.063	.352

Variable definitions: LRETR1=long run income tax expense divided by pre-tax accounting income over the four-year period 2006–2009; LRETR2=long run cash tax paid divided by pre-tax accounting income over the four-year period 2006–2009; BTAX1=pre-tax accounting income less taxable income (where 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) divided by lagged (preceding year) total assets; BTAX2=book-tax gap residual calculated using the method developed by Desai and Dharmapala (2006); TCAP=a dummy variable of 1 if the firm has a MAD ratio greater than one, otherwise it is 0; TPRICE=the transfer pricing index of the firm based on the sum of eight different transfer pricing items divided by eight; INCS=a dummy variable of 1 if the firm has made a negative adjustment to *prima facie* income tax expense on pre-tax accounting profit due to differences between foreign corporate tax rates, otherwise it is 0; MULTI=total foreign sourced income divided by total income; THAV=a dummy variable of 1 if the firm has at least one subsidiary firm incorporated in a tax haven, otherwise it is 0; SIZE=the natural logarithm of total assets; LEV=long-term debt divided by total assets; CINT=net property, plant and equipment divided by lagged total assets; INVINT=inventory divided by lagged total assets; RDINT=R&D expenditure divided by lagged total assets; and ROA=pre-tax income divided by total assets.

Note 1: the dependent variables (LRETR1, LRETR2, BTAX1 and BTAX2) have been winsorized at the 1% level.

there is a reasonable level of consistency between the means and medians, reflecting normality of distributions.

## 5.2. Correlation results

The Pearson pairwise correlation results are reported in Table 2. We find significant ( $p < .05$ ) correlations (with predicted signs) between LRETR1 and TCAP, TPRICE, INCS, SIZE, LEV, CINT, and ROA. We also find significant ( $p < .05$ ) correlations (with predicted signs) between LRETR2 and TCAP, TPRICE, INCS, THAV, SIZE, LEV, and ROA. Moreover, significant ( $p < .05$ ) correlations (with predicted signs) are found between BTAX1 and TCAP, INCS, THAV, SIZE, LEV, and ROA. We also find significant ( $p < .05$ ) correlations (with predicted signs) between BTAX2 and TPRICE, INCS, THAV, SIZE, CINT, and ROA. Table 2 also shows that only moderate levels of collinearity exist between the independent variables. Finally, we compute variance inflation factors (VIFs)

Table 2  
Pearson correlation results.

	LRETR1	LRETR2	BTAX1	BTAX2	TCAP	TPRICE	INCS	MULTI	THAV	SIZE	LEV	CINT	INVINT	RDINT	ROA
TCAP	-.132***	-.107**	.081**	.050*	1										
TPRICE	-.065**	-.010***	.032	.100***	-.165***	1									
INCS	-.132***	-.110***	.073**	.072**	.088**	-.084**	1								
MULTI	-.005	-.052*	.054*	.001	.001	-.062*	.289***	1							
THAV	-.075**	-.08**	.088***	.083***	.111***	.090**	.171**	.254***	1						
SIZE	.132***	.147***	.232***	.120***	.362***	-.285***	.160***	.155***	.389***	1					
LEV	-.133***	-.157***	.110***	.020	.557***	-.183***	.055	.042	.120***	.297***	1				
CINT	-.057**	-.002	.000	.083***	.074	-.032	-.037	-.042	.016	.192***	.156***	1			
INVINT	.033	.052*	-.020	.000	-.023	-.035	-.026	.000	.024	.077**	.110***	-.033	1		
RDINT	-.012	-.001	.000	.001	-.104***	.033	.076**	.116***	-.043	-.084**	-.071***	-.072**	-.066*	1	
ROA	.166***	.185***	.392***	.069**	-.047	-.183***	-.002	-.001	.030	.254***	.113***	.063*	.100***	-.102***	1

Variable definitions: see Table 1 for variable definitions.

Note 1: N=812 for all variables.

Note 2: the dependent variables (LRETR1, LRETR2, BTAX1 and BTAX2) have been winsorized at the 1% level.

\*, \*\*, 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 3

Regression results — base regression model

$$TA_{it} = \alpha_{0it} + \beta_1 TCAP_{it} + \beta_2 TPRICE_{it} + \beta_3 INCS_{it} + \beta_4 MULTI_{it} + \beta_5 THAV_{it} + \beta_6 SIZE_{it} + \beta_7 LEV_{it} + \beta_8 CINT_{it} \\ + \beta_9 INVINT_{it} + \beta_{10} RDINT_{it} + \beta_{11} ROA_{it} + \beta_{12-19} INDSEC_{it} + \beta_{20-22} YEAR_{it} + \varepsilon_{it}.$$

Variable	Predicted sign	LRETR1 <sup>a</sup>	LRETR2 <sup>a</sup>	Predicted sign	BTAX1 <sup>a</sup>	BTAX2 <sup>a</sup>
Intercept	?	.681 (.90)	.511 (.03)	?	.455 (1.45)	.402 (2.11)**
TCAP	–	–.001 (–1.91)**	–.002 (–1.76)**	+	.069 (1.85)**	.001 (2.19)**
TPRICE	–	–.001 (–1.85)**	–.001 (–1.25)	+	.021 (1.78)*	.002 (2.20)**
INCS	–	–.138 (–1.95)**	–.146 (–2.00)**	+	.573 (.44)	.012 (2.36)**
MULTI	–	–.001 (–1.75)**	–.001 (–1.84)**	+	.036 (.81)	.001 (1.68)*
THAV	–	–.043 (–1.37)*	–.131 (–1.35)*	+	.599 (1.33)*	.009 (1.35)*
SIZE	?	.018 (1.05)	.028 (1.31)	?	.657 (1.41)	.006 (2.55)**
LEV	–	–.031 (–.21)	–.132 (–.86)	+	.237 (1.58)*	.013 (.79)
CINT	–	–.029 (–1.09)	–.009 (–.37)	+	.647 (.82)	.001 (.02)
INVINT	+	.011 (.94)	.028 (1.39)*	–	–.201 (–.78)	–.002 (–.44)
RDINT	–	–.103 (–1.02)	–.066 (–.45)	+	.449 (.55)	.021 (.83)
ROA	+	.003 (3.98)***	.004 (3.67)***	?	.131 (1.79)*	.004 (4.29)***
INDSEC		Yes	Yes		Yes	Yes
YEAR		Yes	Yes		Yes	Yes
Adj. R <sup>2</sup> (%)		11.30%	13.61%		23.87%	44.15%
N		812	812		812	812

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

<sup>a</sup> Coefficient estimates with the *t*-statistics in parentheses. Standard errors are corrected based on one-way clustering by firm (see, e.g., Petersen, 2009).

when estimating our base regression model to test for signs of multi-collinearity between the independent variables. We find that no VIFs exceed five, so multi-collinearity is not problematic in our study (Hair, Black, Babin, Anderson, & Tatham, 2006).

### 5.3. Regression results

Table 3 reports the regression results for our base regression model. To control for outliers, we winsorize LRETR1, LRETR2, BTAX1, and BTAX2 at the 1% level prior to

including them in our regression models.<sup>25</sup> Finally, we correct standard errors in our regression models based on one-way clustering by firm as per Petersen (2009).

We find that LRETR1 has a significant negative association with TCAP ( $p < .05$ ). Firms that approach or have breached the maximum allowable debt ratio of one have lower long-run ETRs. These firms use the tax deductibility of interest expense to reduce long-run ETRs in an effectual manner, thus H1 is supported by the results. A significant and negative association between LRETR1 and TPRICE ( $p < .05$ ) provides support for H2. Firms that exhibit poor compliance with the transfer pricing rules also tend to avoid corporate taxes. Moreover, significant negative associations between LRETR1 and INCS, and LRETR1, and MULTI ( $p < .05$ ) are evident from the empirical results, thereby supporting H3 and H4. Firms that have a negative adjustment to income tax expense have lower long-run ETRs, a likely indicator of tax avoidance activities as firm management have the incentive and opportunity to shift funds from higher taxed foreign jurisdictions to Australia. Related to income shifting, we find that firms with proportionately more foreign sourced income have the capacity to move these funds strategically to lower taxed jurisdictions, thereby reducing long-run ETRs. We also observe that subsidiaries incorporated in tax havens assist in lowering long-run ETRs. The significant negative association between LRETR1 and THAV ( $p < .10$ ) thus supports H5. Finally, for our control variables we find a significant positive association between LRETR1 and ROA ( $p < .01$ ).

For LRETR2, we observe that it has a significant negative association with TCAP ( $p < .05$ ). Firms that approach or have breached the statutory maximum allowable debt ratio for tax purposes have lower long-run ETRs, so H1 is again supported by the results. Moreover, we find a significant negative association between LRETR2 and INCS ( $p < .05$ ). Thus, firms that have a negative adjustment to income tax in the accounting income-to-taxable income reconciliation statement have lower long-run ETRs. We also find a significant negative association between LRETR2 and MULTI ( $p < .05$ ), and LRETR2 and THAV ( $p < .10$ ), thus H4 and H5 are supported by the empirical results. Finally, for the control variables, we observe that LRETR2 is significantly positively associated with INVINT ( $p < .10$ ) and ROA ( $p < .01$ ).

In terms of BTAX1, we find that it has a significant positive association with TCAP ( $p < .05$ ), TPRICE ( $p < 0.05$ ), and THAV ( $p < .10$ ), thus H1, H2 and H5 are supported by the empirical results. Book-tax gaps are wider for firms with thinly capitalized structures and with firms that are more likely to be non-compliant with the transfer pricing rules. Finally, those firms that have a subsidiary incorporated in a tax haven have wider book-tax gaps, which indicate corporate tax avoidance. In terms of the control variables, we find that BTAX1 has a significant positive association with ROA ( $p < .10$ ).

Regarding BTAX2, we observe that it has a significant positive association with TCAP ( $p < 0.05$ ), TPRICE ( $p < 0.05$ ), INCS ( $p < 0.05$ ), MULTI ( $p < 0.10$ ), and THAV ( $p < 0.10$ ), thus H1, H2, H3, H4, and H5 are all supported by the empirical results. Firms that have approached or breached the maximum allowable debt ratio of one have higher book-tax gap residuals. These firms use the tax deductibility of interest expenses, which leads to an increase in the difference between accounting income and taxable income. Book-tax gap residuals are also

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<sup>25</sup> We note that for ETRs with negative pre-tax income, they are set to zero. The remaining ETRs are winsorized so that the largest observation is one and the smallest observation is zero. Overall, our results remain stable and hold even if we include negative ETRs as missing values rather than setting them to zero.

wider if firms are less compliant in terms of the transfer pricing rules, if the firm exhibits a negative adjustment to income tax in the accounting income-to-taxable income reconciliation statement or if firms have proportionately greater foreign source income. We also find that firms that have at least one subsidiary incorporated in a tax haven have wider book-tax gap residuals. Finally, in terms of our control variables, we observe that BTAX2 is significantly positively associated with SIZE ( $p < .10$ ) and ROA ( $p < .01$ ).

Overall, our regression results show that firms are likely to employ a variety of international tax avoidance practices to avoid the payment of corporate taxes, including thin capitalization, transfer pricing, income shifting, multinationality, and tax haven utilization. In fact, based on the magnitude and significance levels of the regression coefficients, the use of thin capitalization and transfer pricing represents the most significant drivers of tax avoidance, whereas income shifting and tax haven utilization are less important.

#### 5.4. Robustness checks

We perform several robustness checks to assess the reliability of our regression results (reported in Table 3). First, we drop all of the control variables from the regression model and obtain similar results for TCAP, TPRICE, INCS, MULTI, and THAV. Second, we entered the control variables consecutively into the regression model<sup>26</sup> and our main findings remain unchanged. Third, we successively added each of our five independent variables into the regression model to test the stability of the regression coefficients and robustness of our results. On the whole, the regression coefficients for TCAP, TPRICE, INCS, MULTI, and THAV are stable and statistically significant (with predicted signs) in the various regression models. Fourth, we perform a robustness check to control for the influence of potential outliers. Outliers at  $\pm$  three standard deviations were capped at those levels. Our empirical results remain unchanged. Finally, we re-estimated our regression models using panel regression techniques (i.e., fixed effects and random effects models) that adjust for firm-specific and time-specific effects that can influence our results (see, e.g., Hsiao, 2003; Baltagi, 2005). Again, our key findings for the independent variables remain unchanged.

#### 5.5. Additional analysis

Desai and Hines (2002) and Dharmapala (2008) claim that firms are able to accentuate their international tax avoidance activities of thin capitalization, transfer pricing and income shifting through the use of tax haven incorporated entities. For instance, transfer pricing can involve the use of a tax haven. In this scenario, profits are shifted to a tax haven incorporated subsidiary that is subject to relatively low (if any) corporate taxes (Desai et al., 2006; Wilson, 2009; Slemrod & Wilson, 2009). Thus, we also consider the interaction effects of our independent variables to determine if firms use tax havens in

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<sup>26</sup> Specifically, entering control variables progressively into the regression model provides an indication of whether a particular control variable could significantly drive the outcome of the model (Hair et al., 2006).



conjunction with thin capitalization, transfer pricing, and income shifting to avoid corporate taxes.<sup>27</sup> Specifically, we multiply THAV by TCAP, TPRICE, and INCS, respectively. Our base OLS regression model is extended to include these additional variables and is estimated as follows:

$$\begin{aligned} TA_{it} = & \alpha_{0it} + \beta_1 TCAP_{it} + \beta_2 TPRICE_{it} + \beta_3 INCS_{it} + \beta_4 MULTI_{it} + \beta_5 THAV_{it} \\ & + \beta_6 THAV * TCAP_{it} + \beta_7 THAV * TPRICE_{it} + \beta_8 THAV * INCS_{it} + \beta_9 SIZE_{it} \\ & + \beta_{10} LEV_{it} + \beta_{11} CINT_{it} + \beta_{12} INVINT_{it} + \beta_{13} RDINT_{it} + \beta_{14} ROA_{it} \\ & + \beta_{15-22} INDSEC_{it} + \beta_{23-25} YEAR_{it} + \epsilon_{it} \end{aligned} \quad (5)$$

where:

THAV \* TCAP an interaction term computed by multiplying THAV by TCAP;  
 THAV \* TPRICE an interaction term computed by multiplying THAV by TPRICE; and  
 THAV \* INCS an interaction term computed by multiplying THAV by INCS.

Table 4 reports our additional regression results. We find consistent evidence of interaction effects between thin capitalization, transfer pricing and tax haven incorporation and all four of our corporate tax avoidance measures (LRETR1, LRETR2, BTAX1 and BTAX2). Specifically, we find that THAV \* TCAP has a significant negative association ( $p < .05$ ) with LRETR1 and LRETR2, and a significant positive association with both BTAX1 and BTAX2 ( $p < .05$ ). Similarly, we also find that THAV \* TPRICE has a significant negative association with LRETR1 and LRETR2 ( $p < .10$ ) and a significant positive association with both BTAX1 and BTAX2 ( $p < .05$ ). However, we observe that THAV \* INCS has no significant association with the dependent variables. We also obtain reasonably similar results to those reported in Table 3 for TCAP, TPRICE, INCS, MULTI, and THAV in terms of predicted sign and statistical significance in the extended regression model (LRETR1, LRETR2, BTAX1, and BTAX2). Finally, the regression coefficients for the control variables (SIZE, LEV, CINT, INVINT, RDINT, and ROA) are fairly similar to those reported in Table 3 in terms of predicted sign and statistical significance in this extended regression model (ETR1, ETR2, BTAX1, and BTAX2).

Taken as a whole, these results show that thin capitalization and transfer pricing are potentially channeled through or used in combination with tax havens as a means of avoiding corporate taxes.

## 6. Conclusions

This paper examines the international corporate tax avoidance practices of publicly listed Australian firms. Based on a hand-collected sample of 203 publicly listed Australian firms over the 2006–2009 period (812 firm-years), we find that Australian listed firms use a number of international corporate tax avoidance practices to aggressively reduce their

<sup>27</sup> Our rationale for the construction of these interaction terms is based on situations in which “double dip deductions” can be achieved by a parent multinational firm through complex financing arrangements with its subsidiaries (see, e.g., OECD, 2007; Dahlby, 2008).

Table 4  
Regression results — additional analysis of tax haven interactions

$$TA_{it} = \alpha_{0it} + \beta_1 TCAP_{it} + \beta_2 TPRICE_{it} + \beta_3 INCS_{it} + \beta_4 MULTI_{it} + \beta_5 THAV_{it} + \beta_6 THAV * TCAP_{it} + \beta_7 THAV * TPRICE_{it} + \beta_8 THAV * INCS_{it} + \beta_9 SIZE_{it} + \beta_{10} LEV_{it} + \beta_{11} CINT_{it} + \beta_{12} INVINT_{it} + \beta_{13} RDINT_{it} + \beta_{14} ROA_{it} + \beta_{15-22} INDSEC_{it} + \beta_{23-25} YEAR_{it} + \epsilon_{it}$$

Variable	Predicted sign	LRETR1 <sup>a</sup>	LRETR2 <sup>a</sup>	Predicted sign	BTAX1 <sup>a</sup>	BTAX2 <sup>a</sup>
Intercept	?	.074 (1.00)	.805 (.88)	?	.181 (1.48)	.521 (2.42)**
TCAP	-	-.001 (-1.89)**	-.001 (-2.01)**	+	.085 (1.49)*	.001 (2.49)***
TPRICE	-	-.002 (-1.57)*	-.002 (1.46)*	+	.034 (1.99)**	.001 (2.01)**
INCS	-	-.151 (-1.78)**	-.171 (-2.02)**	+	.759 (.47)	.014 (1.89)**
MULTI	-	-.001 (-1.84)**	-.001 (-1.81)**	+	.036 (.81)	.001 (1.84)**
THAV	-	-.046 (-1.36)*	-.106 (-1.75)**	+	.394 (1.76)**	.032 (1.96)**
THAV * TCAP	-	-.001 (-1.92)**	-.002 (-2.11)**	+	.053 (2.34)**	.002 (1.88)**
THAV * TPRICE	-	-.001 (-1.44)*	-.004 (-1.61)*	+	.107 (2.17)**	.001 (1.75)**
THAV * INCS	-	-.051 (-.53)	-.074 (-.61)	+	.183 (.14)	.008 (.59)
SIZE	?	.016 (1.03)	.024 (1.28)	?	.599 (1.43)	.006 (2.40)**
LEV	-	-.013 (-.08)	-.074 (-.46)	+	.216 (1.61)*	.008 (.47)
CINT	-	-.031 (-1.12)	-.013 (-.54)	+	.476 (.82)	.001 (.05)
INVINT	+	.013 (1.02)	.033 (1.54)*	-	-.110 (-.75)	-.001 (-.30)
RDINT	-	-.103 (-1.01)	-.064 (-.40)	+	.263 (.58)	.021 (.82)
ROA	+	.003 (3.88)***	.004 (3.68)***	?	.136 (1.80)**	.004 (4.42)***
INDSEC		Yes	Yes		Yes	Yes
YEAR		Yes	Yes		Yes	Yes
Adj. R <sup>2</sup> (%)		11.51%	14.85%		23.90%	44.38%
N		812	812		812	812

Variable definitions: THAV\*TCAP=an interaction term computed by multiplying THAV by TCAP; THAV\*TPRICE=an interaction term computed by multiplying THAV by TPRICE; THAV\*INCS=an interaction term computed by multiplying THAV by INCS; and see Table 1 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.

<sup>a</sup> Coefficient estimates with the *t*-statistics in parentheses. Standard errors are corrected based on one-way clustering by firm (see, e.g., Petersen, 2009).

corporate tax liabilities. Specifically, we find that thin capitalization, transfer pricing, income shifting, multinationality and tax haven utilization are significantly associated with tax avoidance. Indeed, based on the magnitude and significance levels of the regression coefficients, the use of thin capitalization and transfer pricing is the primary drivers of tax avoidance, and thus may be considered economically as the most important in offering opportunities or tools for firms to carry out international tax avoidance, while income shifting and tax haven utilization are less important. Our additional results also show that tax havens are likely to be used together with thin capitalization and transfer pricing to maximize international tax avoidance opportunities through the increased complexity offered by transactions carried out through tax havens.

This study is subject to several limitations. First, the sample is drawn from publicly listed Australian firms. Because of data unavailability, we could not include unlisted firms in our sample. Second, given that tax return data are private, we constructed our various tax avoidance measures based on financial statement data. The literature (see, e.g., Plesko, 2003) questions the accuracy of financial-statement-based tax avoidance measures (especially ETRs), so our results should be interpreted with caution. Finally, our base regression model could be incomplete.<sup>28</sup> For example, the role of tax authorities could impact international tax avoidance activities. However, we excluded this variable owing to data and cost constraints. Future research could consider this issue.

#### **Appendix A. List of OECD (2006) cited tax havens**

The OECD's (2006) 33 tax havens are represented as follows: Anguilla, Antigua and Barbuda, Bahamas, Bahrain, Bermuda, Belize, British Virgin Islands, Cayman Islands, Cook Islands, Cyprus, Dominica, Gibraltar, Grenada, Guernsey, Isle of Man, Jersey, Liberia, Malta, Marshall Islands, Mauritius, Montserrat, Nauru, Netherlands Antilles, New Caledonia, Panama, Samoa, San Marino, Seychelles, St. Lucia, St. Kitts and Nevis, St. Vincent and the Grenadines, Turks and Caicos Islands and Vanuatu.

#### **Appendix B. Description of Desai and Dharmapala's (2006) method for calculating the BTG residual**

Applying the Desai and Dharmapala (2006) methodology, 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) were calculated for each firm in each year using a measure of total accruals developed by Healy (1985).

<sup>28</sup> This situation could possibly lead to omitted variable bias (see, e.g., Baltagi, 2005). However, assuming that any missing covariates are only theoretically correlated with the dependent variable, then the standard assumptions of OLS regression analysis are not violated. In fact, the error term may contain omitted variables provided they are uncorrelated with the other control variables.

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

$$TA_{it} = EBEI_{it} - (CFO_{it} - EIDO_{it}) \quad (6)$$

where:

i	firms 1 through 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:

$$BTG_{it} = \beta_1 TAC_{it} + \mu_{it} + \varepsilon_{jt} \quad (7)$$

where:

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

The residual value of BTG is considered by [Desai and Dharmapala \(2006\)](#) to reflect tax avoidance activity (TA):  $TA_{it} = \mu_{it} + \varepsilon_{it}$ .

### **Appendix C. Determination of a firm's thin capitalization position based on the method statement in section 820-95 of ITAA97**

The method statement provided in section 820-95 of ITAA97 is summarized as follows:

- Step 1: Work-out the average value, for the income year, of all the assets of the entity;
- Step 1A: Reduce the result of step 1 by the average value, for that year, of all the excluded equity interests in the entity;
- Step 2: Reduce the result of Step 1A by the average value, for that year, of all the associated entity debt of the entity;
- Step 3: Reduce the result of step 2 by the average value, for that year, of all the associate entity equity of the entity;
- Step 4: Reduce the result of step 3 by the average value, for that year, of all controlled foreign entity debt of the entity;
- Step 5: Reduce the result of step 4 by the average value, for that year, of all the controlled foreign entity equity of the entity;
- Step 6: Reduce the result of step 5 by the average value, for that year, of all the non-debt liabilities of the entity. If the result of this step is a negative amount, it is taken to be nil;

- Step 7: Multiply the result of step 6 by 3/4; and
- Step 8: Add to the result of step 7 the average value, for that year, of the entity's associate entity excess amount. The result of this step is the safe harbor debt amount.

Consider an example. ABC Ltd. is a listed Australian firm with an average value of assets of AUD\$100 million. The average values of its relevant associate entity debt, associate entity equity, controlled foreign debt, controlled foreign entity equity, and non-debt liabilities are AUD\$10million, AUD\$8million, AUD\$5million, AUD\$2million and AUD\$5million, respectively. Deducting these amounts from the average asset value leaves AUD\$70 million. Multiplying AUD\$70 million by 75% results in AUD\$52.5 million: the safe harbor debt amount. The average debt amount (mainly interest bearing liabilities) is compared to the safe harbor debt amount. If the average debt amount is greater than AUD\$52.5 million, debt deductions on that excess amount may be denied. The proxy measure of safe harbor debt amount and whether an entity can be regarded as thinly capitalized are based on the accounting definition of assets and liabilities (ATO, 2002, 2005a, 2006). Finally, the thin capitalization tax provisions rely on the valuation rules in the accounting standards to provide the value of assets and non-debt liabilities (ATO, 2002).

#### **Appendix D. Evidence of tax avoidance activities related to transfer pricing**

Items that are represented by the transfer pricing score in our study are:

1. The existence of interest free loans which may be an indicator of transfer pricing;
2. In accordance with AASB 124 Related Party Disclosures, a firm is required to disclose any debt forgiveness (a financial benefit) between related entities. The existence of debt forgiveness can be used as a pointer towards non-arm's length transfer pricing arrangements. If debts have been forgiven without commercial justification or with no justification, this may be indicative of aggressiveness around transfer pricing;
3. The existence of impaired loans between related parties is another scheme whereby amounts could be transferred between related parties with no or weak commercial justification. Impairment of loans may lead to a tax benefit for one of the parties as this may ultimately reduce taxable income;
4. Provision of non-monetary considerations (services or non-liquid assets) without commercial justification;
5. Absence of formal documentation held to support the selection and application of the most appropriate arm's length methodologies or the absence of formal documentation relating to transfer pricing;
6. Disposal of capital assets to a related party without commercial justification;
7. The absence of arm's length justification for transactions between related parties; and
8. The transfer of losses between related parties without commercial justification.

Related party transactions which are deemed to lack commercial justification are those where there is a transfer of assets, loans advanced to or repaid by related parties or provision of services between related parties often in different tax jurisdictions where there is at least one of the following elements: (1) no disclosed rationale for undertaking material

transactions and the value of the assets or value of the services provided are material or significant (based on total revenue or total assets of the firm) and thus there is an expectation that the underlying commercial reasoning for the transfer be provided; (2) there is no statement in the report describing that the terms of the transaction were based on arms-length pricing; (3) the amounts are substantially larger than similar transactions (if any) undertaken in preceding or subsequent years with no specific related event to explain the reason for the transaction and the amount of the transaction (e.g., restructuring); (4) there is no indication that expert advice was obtained about material transactions; (5) if the terms of the financial benefit are unusual or extraordinary or excessively generous, then it is less likely that the terms will be considered unreasonable and so would not be on arm's length terms; and (6) there is a negative impact on the firm's financial position or performance that is not balanced by sufficient positive effects, such that the terms would not be reasonable in the circumstances if the parties were dealing at arm's length (AASB, 2008; ASIC, 2010; ATO, 2005b).

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