Determinants of transfer pricing aggressiveness: Empirical evidence from Australian firms ☆

ABSTRACT

This study examines the major determinants of transfer pricing aggressiveness. Based on a hand-collected sample of 183 publicly-listed Australian firms for the 2009 year, our regression results show that firm size, profitability, leverage, intangible assets, and multinationality are significantly positively associated with transfer pricing aggressiveness after controlling for industry-sector effects. Our additional regression results also indicate that firms augment their transfer pricing aggressiveness through the joint effects of intangible assets and multinationality.

1. Introduction

The purpose of this study is to examine the major determinants of transfer pricing [1] aggressiveness as a means by which firms can significantly reduce their corporate tax liabilities. Multinational firms can structure and price payments and intra-firm trade in such a way as to facilitate tax avoidance, principally by strategically setting artificial inter-company transfer prices (Grubert and Mutti, 1991; Grubert, 2003; Clausing, 2006; Usmen, 2012). The aim of Australia's transfer pricing rules is to ensure that related party international transactions are conducted on an arm's length basis so that profits are not artificially deflated (inflated) in high-tax jurisdictions (low-tax jurisdictions) (Hamilton et al., 2001). Aggressive transfer pricing activity is reflected by extensive non-arm's length transactions between related parties.

We are motivated in this study to evaluate the major determinants of transfer pricing aggressiveness because audit activity by tax authorities and economic analysis by treasury departments have collectively found that mispricing of related party transactions is a major factor contributing to a progressive erosion of corporate tax revenue. [2] Transfer pricing risks are

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[1] Transfer pricing is a system of laws and practices utilized by countries to ensure that goods and services are transferred amongst related parties at market-based prices so that profits are correctly attributable to different jurisdictions (Joint Committee on Taxation, 2010).

[2] This is evident by a decline in effective tax rates (ETRs) and the increase in the number of firms reporting a zero or nominal corporate tax liability.

considered high-priority in Australia by the Australian Taxation Office (ATO) which recently requested information from 150 large (i.e. greater than AUD100 million turnover) corporate groups on: restructuring, financing relating to guarantee fees and intra-group loans, services provided and received, and related party transactions (ATO, 2010). These risk reviews stem from transfer pricing audits carried out by the ATO in 2001–2006 which resulted in amended tax assessments of AUD1.33 billion, with an additional AUD1.25 billion in disallowed tax losses (ATO, 2010). The nature and outcome of review and audit activity by the ATO over the past decade is indicative of the large tax risks related to transfer pricing. Transfer pricing also appears to be a major issue globally. For instance, a recent Ernst and Young (2011) survey found that tax risks associated with transfer pricing constitute one of the most critical and challenging issues facing firms internationally.[3] Transfer pricing is economically important to multinational firms with flow-on effects on earnings, dividends, return on capital and share prices (Sikka and Willmott, 2010).[4] In the Australian context, transfer pricing is economically important because Australia is an active global trader of goods and services (The Treasury, 2011).[5]

Based on a hand-collected sample of 183 publicly-listed Australian firms for the 2009 year, our regression results demonstrate that firm size, profitability, leverage, intangible assets, and multinationality are significantly positively associated with transfer pricing aggressiveness after controlling for industry-sector effects. Our additional regression results also show that firms enhance their transfer pricing aggressiveness via the joint effects of intangible assets and multinationality.

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[3] As indicated by Ernst and Young (2011), the anticipated review of intercompany financing (service) transactions by tax authorities increased significantly from 7 percent (55 percent) in 2007 to 42 percent (66 percent) in 2010.

[4] Eden et al. (2005) examined the impact of the U.S. transfer pricing penalty on the stock market valuation of Japanese multinational firms with U.S. subsidiaries. They found that the penalty resulted in a decline in their cumulative market value of USD56.1 billion, representing 12.6 percent of their 1997 market value.

[5] For example, intra-firm trade in 2009 accounted for around 50 percent of total Australian cross border trade in goods in services and 22 percent of gross domestic product (GDP) (The Treasury, 2011).

This study contributes to the literature in several important ways. First, it extends the literature on transfer pricing practices of multinational firms by providing empirical evidence of the key determinants of transfer pricing aggressiveness. Second, a measure of transfer pricing aggressiveness is constructed based on attributes regularly emphasized in the ATO's audit programs and issues scrutinized by the Australian Securities and Investment Commission (ASIC). Construction of a transfer pricing aggressiveness index provides a methodological contribution that extends beyond Australian corporate transfer pricing research because this index permits replication in other jurisdictions (e.g. Canada, New Zealand, the U.K. and the U.S.). Third, this study investigates the interaction effect between intangible assets, multinationality and tax havens to determine whether these variables are used concurrently to augment transfer pricing aggressiveness. To the best of our knowledge, these issues have not been addressed empirically in the literature. Finally, this study provides valuable information about the major determinants of transfer pricing aggressiveness to policymakers and regulators who should find our results useful in terms of developing policy and regulation.

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

2. Theory and hypotheses development

Several variables are argued to represent key determinants of transfer pricing aggressiveness. These are: firm size, profitability, firm leverage, intangible assets, multinationality, and tax haven utilization. The rationale and literature support for each of these variables is now discussed.

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2.1. Firm size

Larger firms typically engage in more business activities and financial transactions than smaller firms, thereby providing additional opportunities to significantly avoid corporate taxes (Rego, 2003). Larger firms (as opposed to smaller firms) tend to have: substantial intercompany transactions that may have transfer pricing and/or thin capitalization implications, tax-advantaged leasing and financing arrangements, and complex flowthrough entities (including partnerships and trusts). Larger firms therefore are able to take advantage of tax arbitrage opportunities that may exist across different tax jurisdictions. Furthermore, Mills et al. (1998) and Slemrod (2001) suggested that larger firms have lower average costs of tax planning than smaller firms. Hence, larger firms can achieve economies of scale through tax planning, and have the resources and incentives to reduce the amount of corporate taxes payable (Rego, 2003).

Research by Hanlon et al. (2007) found that larger firms normally have greater tax deficiencies relative to their actual tax liability. Moreover, Bernard et al. (2006) observed that larger firms engage in greater manipulation of transfer prices. Finally, research by Benvignati (1985), Al-Eryani et al. (1990), and Conover and Nichols (2000) also found that larger firms are more likely to participate in aggressive transfer pricing arrangements. To formally test the impact of firm size on transfer pricing aggressiveness, we develop the following hypothesis:

H1. Firm size is positively associated with transfer pricing aggressiveness.

2.2. Profitability

More profitable firms are likely to engage in transactions or schemes designed to significantly avoid corporate taxes (Rego, 2003). Furthermore, research by Wilkie (1988) and Wilkie and Limberg (1993) found a positive association between pre-tax income and effective

tax rates (ETRs). Rego (2003) also found that firms with greater pre-tax income avoid proportionately more corporate taxes than firms with less pre-tax income. In terms of transfer pricing, more profitable firms may adjust transfer prices to reduce (increase) profits in high-tax (low-tax) jurisdictions. For instance, highly-profitable firms such as Apple, Google and Microsoft have been able to preferentially locate profits in low-tax jurisdictions and increase tax deductible expenditure (e.g. royalty payments) in high-tax jurisdictions to reduce taxable profits accordingly (Mutti and Grubert, 2009; Womack and Drucker, 2011; Duhigg and Kocieniewski, 2012). To formally test the impact of firm profitability on transfer pricing aggressiveness, we develop the following hypothesis:

H2. Firm profitability is positively associated with transfer pricing aggressiveness.

2.3. Firm leverage

Highly-leveraged firms are likely to take advantage of the main characteristics of debt capital (i.e. the fungibility of borrowed funds) to significantly avoid corporate taxes (Hines, 1996; Richardson et al., 1998; Newberry and Dhaliwal, 2001; Rego, 2003, Dyreng et al., 2008). Previous research by Bernard et al. (2006) showed that firms with high debt-to-equity ratios tend to be more tax aggressive than firms with low debt-to-equity ratios. In fact, tax considerations appear to make debt the preferential form of financing in high-tax jurisdictions and equity in low-tax jurisdictions (Hines, 1996; Rego, 2003; Dyreng et al., 2008). Multinational firms normally finance group members with transfers of debt and/or equity capital (Richardson et al., 1998). Transfers of debt and/or equity capital are motivated in part by tax arbitrage opportunities and thus, firms that engage in selective localization of debt for tax purposes are more likely to be aggressive in terms of their transfer pricing arrangements (Richardson et al., 1998). It is possible

that leverage may act as a substitute to transfer pricing aggressiveness in terms of achieving reduced group tax liabilities. To formally test the impact of firm leverage on transfer pricing aggressiveness, we develop the following hypothesis:

H3. Firm leverage is positively associated with transfer pricing aggressiveness.

2.4. Intangible assets

Another key issue regarding transfer pricing aggressiveness is the transfer of intangible assets (e.g. intellectual property and R&D expenditure) to group entities (Grubert, 2003; Grubert and Mutti, 2007; Gravelle, 2010). Since intangible assets are difficult to value, the transfer of payments (i.e. the royalties attributed to intangibles) are also difficult to value at arm's length prices (Gravelle, 2010). The U.S. Department of the Treasury (2007) asserts that there is a significant risk of transfer pricing aggressiveness through the transfer of high value intangible assets (e.g. intellectual property) that are crucial to the core business operations of a firm and are difficult to value. In fact, Grubert (2003) found that the risk of transfer pricing aggressiveness is increased by the variability in the interpretation of transfer pricing valuations, and the difficulty for firms to define precisely the transaction under which intangible property transfers take place.

The average level (i.e. current and previous reporting period) of intangibles is considered to be a proxy of a firm's ability to shift income internationally (Hanlon et al., 2007; Dyreng et al., 2008). Undeniably, intangibles have certain characteristics such as the lack of well-established markets and subjective valuations that can be exploited simultaneously by a firm in several jurisdictions. Hence, there is greater opportunity to engage in transfer pricing aggressiveness through the transfer of intangible assets between variably-taxed jurisdictions (Shackelford et al., 2007; Dyreng et al., 2008). Finally, tax benefits derived from R&D expenditure may vary

depending on the host country of that expenditure. In Australia for example, the R&D tax concessions allow firms to claim a tax deduction in their income tax return of up to 125 percent (and in some cases up to 175 percent) of their eligible expenditure on R&D activities. To formally test the impact of intangible assets on transfer pricing aggressiveness, we develop the following hypothesis:

H4. Intangible assets are positively associated with transfer pricing aggressiveness.

2.5. Multinationality

Given that multinational firms regularly apply efficient tax planning across group entities, it is plausible that firms with subsidiaries that derive foreign source income will have the incentive and opportunities to engage in tax avoidance (Rego, 2003; Hanlon et al., 2007). For instance, multinational firms have the opportunity to reduce corporate taxes by locating operations in low-tax jurisdictions, by shifting income from high-tax jurisdictions to low-tax jurisdictions, and by exploiting variations in the tax rules of different countries (Slemrod, 2001). In fact, Slemrod (2001) claims that multinational firms employ a set of inter-related, globally orientated tax planning methods and tools to efficiently reduce group tax liabilities.

Rego (2003) found that multinational firms tend to be more successful at avoiding corporate taxes than purely domestic firms as the former are able to achieve economies of scale in tax planning through the use of their extensive operations and inter-firm trade. Mills and Newberry (2004) observed that multinational firms with relatively low average foreign tax rates reported lower taxable income in U.S. subsidiaries than firms with relatively high average foreign tax rates. Hanlon et al. (2007) found that foreign controlled firms have more than double the levels of tax aggressiveness relative to domestic controlled firms. Similarly, Dyreng et al. (2008)

observed that firms with greater international exposure have more opportunities to engage in tax avoidance strategies. Benvignati (1985) found that firms with a larger number of foreign subsidiaries showed a strong positive association with their market-based transfer pricing strategy. Finally, Jacob (1996) observed that multinational firms had greater opportunities to engage in manipulation of transfer prices owing to differences in tax rates and profitability between U.S. and foreign group entities. To formally test the impact of multinationality on transfer pricing aggressiveness, we develop the following hypothesis:

H5. Multinationality is positively associated with transfer pricing aggressiveness.

2.6. Tax haven utilization

Transfer pricing aggressiveness may be facilitated if members of the corporate group are residents of countries with tax haven status that offer beneficial financial, legal and taxation regimes (ATO, 2004; OECD, 2006; Dharmapala, 2008). Tax havens may impose no, or only nominal amounts of corporate tax, have laws or administrative practices which prevent the effective exchange of information between tax authorities, and lack transparency on financial and tax arrangements (e.g. regulatory, legal and administrative provisions), and access to financial records (OECD, 2006). Tax havens also promote tax avoidance via transfer pricing 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). Specifically, tax avoidance can be achieved through transfer pricing manipulation by transferring goods to countries with low income tax rates (e.g. tax havens) at the lowest possible transfer price and by transferring goods out of these countries at the highest possible transfer price. Tax havens may thus facilitate transfer pricing aggressiveness by acting as a conduit for the flow of goods and services between

countries with established operations and parent firms domiciled in higher taxed countries (Department of the Treasury, 2007; The Treasury, 2011).

Firms may also exploit the secrecy laws and lack of transparency of tax havens to conceal assets and income that may be subject to tax in Australia (OECD, 2006). Harris et al. (1993) found that U.S. tax liabilities were lower for U.S. multinational firms with a legal presence in a tax haven. They inferred this to be indirect evidence of aggressive transfer pricing by firms with tax haven incorporated subsidiaries. Moreover, firms incorporated in a jurisdiction with tax haven status may play an important role for the entire corporate group (Slemrod and Wilson, 2009; Wilson, 2009). For example, tax haven incorporated firms may control the treasury, insurance, business and service functions for the corporate group, or facilitate the tax efficient transfer of funds between group entities. Thus, efficient tax planning across group entities involving tax haven incorporated firms could have a major impact on the accountability and transparency of the entire corporate group (Desai et al., 2007). It is possible that utilization of tax havens may act as a substitute to transfer pricing aggressiveness in terms of achieving reduced group tax liabilities. To formally test the impact of tax haven utilization on transfer pricing aggressiveness, we develop the following hypothesis:

H6. Tax haven utilization is positively associated with transfer pricing aggressiveness.

3. Research design

3.1. Sample selection and data source

Our sample initially consisted of the top 300 publicly-listed Australian firms for the 2009 year.[6] However, the sample was then reduced to 183 firms after excluding firms which fall into the following categories: financial firms (41); insurance firms (11); U.S. generally accepted accounting principle (GAAP) reporting firms (16); property partnership or trust entities (11); firms that did not report in the 2009 year because they were newly incorporated or were taken-over or merged with other firms (20); and firms with no overseas subsidiaries (18). Financial institutions and insurance firms were excluded from the sample due to significant differences in the application of accounting policies and derivation of accounting estimates, along with the different regulatory constraints faced by these firms. Finally, all financial data were hand-collected from the annual reports of the sample firms.

3.2. Base regression model

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

$$TPRICE_{it} = \alpha_{0it} + \beta_1 SIZE_{it} + \beta_2 PROFIT_{it} + \beta_3 LEV_{it} + \beta_4 INTANG_{it} + \beta_5 MULTI_{it}$$

$$+ \beta_6 THAV_{it} + \beta_{7-15} INDSEC_{it} + \varepsilon_{it} \tag{1}$$

where: i = firms 1–183; t = the 2009 financial year; *TPRICE* = the transfer pricing aggressiveness index ranging 0–100 percent; *SIZE* = the natural logarithm of total assets; *PROFIT* = the natural logarithm of pre-tax income; *LEV* = long-term debt divided by total assets; *INTANG* = the natural logarithm of R&D expenditure; *MULTI* = the number of foreign subsidiaries divided by the total number of subsidiaries; *THAV* = a dummy variable of 1 if the

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[6] The 2009 financial year was chosen as this year coincided with the final stages of the global financial crisis (GFC). Adams (2009) claims that transfer pricing issues were more important for multinational firms during the GFC owing to the decline in forecast tax revenues by treasury departments, and the increased number of transfer pricing audits by tax authorities during this period. For instance, during the GFC in Australia, audit activity by the ATO found that multinational firms were aggressively transferring existing or unrealized tax losses from foreign operations with lower ETRs back to Australia with higher ETRs (ATO, 2008b). It is possible that firms facing financial distress could be particularly motivated to use transfer pricing to increase cash flows and liquidity.

firm has at least one subsidiary company incorporated in an OECD (2006) listed tax haven, otherwise 0; *INDSEC* = industry sector dummy variable of 1 if the firm is represented in the particular Global Industry Classification Standard (GICS) category, otherwise 0; and ε = the error term.

3.3. Dependent variable

Our dependent variable is represented by transfer pricing aggressiveness (*TPRICE*). We develop a *TPRICE* index which comprises eight dichotomous items (see below). The 'sum-score' approach has been used successfully in other research, especially in relation to the construction of corporate governance indexes (e.g. Cremers and Nair, 2005; Karamanou and Vafeas, 2005; Brown and Caylor, 2006; Bebchuk et al., 2009), and the development of accounting disclosure indexes (e.g. Singhvi and Desai, 1971; Choi, 1973; Buzby, 1974; Barrett, 1975; Wallace, 1988; Cooke and Wallace, 1989; Cooke, 1991; Adhikari and Tondkar, 1992; Bavishi, 1995; Salter and Niswander, 1995; Marston and Shrives, 1991; Zarzeski, 1996; Lanis and Richardson, 2012). The dichotomous items representing *TPRICE* collectively measure the occurrence of several transactions that are either non-commercial in nature or the firm has not been able to substantiate the commerciality of those transactions. Therefore, *TPRICE* measures the degree of transfer pricing aggressiveness.

Consistent with the use and application of corporate governance and disclosure related indexes in previous research, the higher (lower) the overall score for *TPRICE*, the higher (lower) is the level of transfer pricing aggressiveness. Items that comprise the *TPRICE* index were selected based on the general criterion that they must involve intra-entity transactions that are not commercially justified or not of a commercial or arm's length nature in line with ATO (2005)

and ASIC (2010) guidelines and regulations dealing with aggressive transfer pricing activity.[7]

This general criterion ensures that our *TPRICE* index is 'all-inclusive' of the major types of

transfer pricing aggressiveness that are disclosed by firms in the annual report. Thus, we find

eight items in the annual report that satisfy our general criterion as follows:[8]

(1) The existence of interest free loans between related entities;

(2) The existence of debt forgiveness between related entities;

(3) The existence of impaired loans between related entities;

(4) The provision of non-monetary consideration (e.g. services or non-liquid assets) without

    commercial justification between related entities;

(5) The absence of formal documentation held by the firm to support the selection and

    application of the most appropriate arm's length methodologies or the absence of formal

    documentation relating to transfer pricing between related entities;

(6) The disposal of capital assets to related entities without commercial justification;

(7) The absence of arm's length justification for transactions between related entities; and

(8) The transfer of losses between related entities without commercial justification.

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[7] Intra-entity transactions which are deemed to lack commercial justification include those, for example, where there was 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 was at least one of the following elements: (a) no disclosed rationale for undertaking material transactions and the value of the assets or value of the services provided were material or significant (based on total revenue or total assets of the firm), so there is an expectation that the underlying commercial reasoning for the transfer be provided; (b) there was no statement in the report describing that the terms of the transaction were based on arms-length pricing; (c) the amounts were substantially larger than similar transactions (if any) undertaken in preceding or later years with no particular related event to explain the reason for the transaction and the amount of the transaction; (d) there was no indication that expert advice was obtained in relation to material transactions; (e) if the terms of the financial benefit are unusual or extraordinary, or excessively generous, then it is less likely that the terms can be considered 'reasonable' and so would not be arm's length terms; and (f) there is a negative effect 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. This data were collected from ATO (2005) and ASIC sources (2010) in conjunction with accounting standard AASB 124 (AASB, 2008), targeting transfer pricing arrangements that do not comply with the *Corporation Act 2001 (Cwlth)* requirements or are considered as 'high risk' elements by the ATO (2005).

[8] These eight items were extracted from the financial statement notes in the annual report. Specifically, the sections dealing with borrowings, receivables, payables, and related party transactions.

A description and examples of coding of 1 against each of the items that comprise *TPRICE* is provided in Appendix A. Evidence for the existence (or otherwise) of each item was obtained from both narrative and accounting data in the notes to the financial statements,[9] and the corporate governance section of the annual report.

The ATO and ASIC have targeted tax avoidance schemes or schemes that are non-compliant with the *Corporation Act 2001 (Cwlth)* which involve each of the eight aforementioned items. These eight items are considered by the ATO (2005) and ASIC (2010) as high risk as they result in the transfer of benefits to related entities without commercial justification.[10] Australian firms that engage in international dealings with related entities are also required to complete a *Schedule 25A Form* under Australian tax legislation and lodge it along with their annual tax return. The *Schedule 25A Form* imposes strict obligations on firms to disclose information about their related entity international dealings, such as the commercial basis for setting prices for goods and services, and loans provided and received.

Each of the eight transfer pricing aggressiveness items represented in the sample was scored as either '1' where the firm engaged in activities indicative of transfer pricing aggressiveness and were unable to substantiate the arm's length or commercial basis of transactions, or '0' where there was no evidence of activities suggestive of transfer pricing aggressiveness. To ensure objective and reliable scoring of the eight transfer pricing aggressiveness items, a checklist and a set of decision rules were developed initially by the primary author (see Appendix B). The

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[9] In particular sections dealing with financial income and expenses: trade and other receivables, investments in controlled entities and associated entities, trade and other payables, interest bearing liabilities, related party transactions, asset disposals, and tax losses were used to obtain evidence for each of the *TPRICE* items.

[10] Furthermore, as part of its tax compliance program, the ATO (2010) examines the transfer of loans between group members that are then forgiven without any commercial justification with the net result of a tax benefit being achieved. Similarly, ASIC (2010) has formulated additional guidance for firms in disclosing and justifying the nature of their related entity transactions. ASIC (2010) requires disclosure of transactions involving debt forgiveness between related entities, the determination of arm's-length pricing, terms and conditions and application of exceptions if applicable, and lack of expert advice about related entity loans.

scoring was then performed by one of the other authors and a research assistant within a three-month period of when the primary author collected the data. The scoring was subsequently cross-checked by the primary author to determine the error rate in each individual's scoring. The primary author randomly selected a sub-sample of 40 firms (around 20 percent of the sample firms) to achieve this task. Several errors were detected by the primary author during the cross-checking, but the total number of errors was found to be insignificant and they were adjusted accordingly. Overall, the results of the cross-checking are indicative of the reliability of measurement of the *TPRICE* index. Finally, our measure of a sample firm's transfer pricing aggressiveness activity is computed as the sum of the individual number of the transfer pricing aggressiveness items that it discloses in its annual report (each scored as '1') divided by the number of items applicable to that firm.[11] This computation resulted in a *TPRICE* index ranging between 0–100 percent for each sample firm. In the majority of firms (96 percent), all eight items were applicable. However, a minority (4 percent) of firms did not disclose the existence of intragroup loans and hence *ITEM1* (the existence of interest free loans), *ITEM2* (the existence of debt forgiveness) and *ITEM3* (the existence of intragroup loan impairment) of *TPRICE* were not considered applicable. *TPRICE* was then computed using five applicable items.

Table 1 presents the descriptive statistics of the eight transfer pricing aggressiveness items that comprise the *TPRICE* index. The most important items relate to *ITEM1*, *ITEM5* and *ITEM7*. Specifically, *ITEM1* (mean of 0.469) shows that around 46.9 percent of the sample firms disclose the existence of interest free loans between related entities. *ITEM5* (mean of 0.901) indicates that

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[11] Each item is treated equally in the scoring of our *TPRICE* index. In fact, previous research indicates that weighted and un-weighted scores generally provide similar results (Marston and Shrives, 1991; Beattie et al., 2004). Moreover, the focus of our study is not on one particular user group as such, so weighting of transfer pricing items was not undertaken. Cooke (1989) for example, claims that one class of user will attach different weights to an item than another class of user. Finally, the development of weighted indices also involves subjective judgment (Marston and Shrives, 1991; Beattie et al., 2004).

about 90.1 percent of the sample firms disclose either the absence of formal documentation held by the firm to support the selection and application of the most appropriate arm's length methodologies or the absence of formal documentation relating to transfer pricing between related entities. *ITEM7* (mean of 0.300) illustrates that around 30 percent of the sample firms disclose the absence of arm's length justification for transactions between related entities. Less important items include *ITEM2*, *ITEM3* and *ITEM4*. In particular, *ITEM2* (mean of 0.103) shows that around 10.3 percent of the sample firms disclose the existence of debt forgiveness between related entities. *ITEM3* (mean of 0.142) indicates that about 14.2 percent of the sample firms disclose the existence of impaired loans between related entities. *ITEM4* (mean of 0.103) illustrates that around 10.3 percent of the sample firms disclose the provision of non-monetary consideration (e.g. services or non-liquid assets) without commercial justification between related entities. Finally, far less important items include *ITEM6* and *ITEM8*. Specifically, *ITEM6* (mean of 0.032) shows that around 3.2 percent of the sample firms disclose the disposal of capital assets to related entities without commercial justification. *ITEM8* (mean of 0.060) indicates that around 6 percent of the sample firms disclose the transfer of losses between related entities without commercial justification.

[**Insert Table 1 About Here**]

3.4. Independent variables

Our independent variables are denoted by firm size (*SIZE*), firm profitability (*PROFIT*), firm leverage (*LEV*), intangible assets (*INTANG*), multinationality (*MULTI*), and tax haven utilization (*THAV*).

SIZE is measured as the natural logarithm of total assets in keeping with previous research by Stickney and McGee (1982), Porcano (1986), and Richardson and Lanis (2007). *PROFIT* is

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measured as the natural logarithm of pre-tax income in line with Rego (2003). *LEV* is measured

as long-term debt divided by total assets in accordance with previous research by Stickney and

McGee (1982) and Gupta and Newberry (1997). *INTANG* is measured as the natural logarithm of

R&D expenditure as recommended in earlier research by Dyreng et al. (2008).[12] *MULTI* is

measured as the total number of foreign subsidiaries divided by the total number of subsidiaries

in keeping with previous research by Rego (2003) and Mills and Newberry (2004). Finally,

THAV is measured as a dummy variable of 1 if the firm has at least one subsidiary company

incorporated in an OECD (2006) listed tax haven,[13] otherwise 0 (Desai et al., 2006; Dharmapala

and Hines, 2009; Richardson et al., 2013).[14]

3.5. Control variables

We include industry-sector (*INDSEC*) as a control variable in our base regression model.

INDSEC dummy variables, defined by the two-digit GICS codes, are included as control

variables in our base regression model because it is possible for transfer pricing aggressiveness

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[12] Dyreng et al. (2008) found that R&D expenditure is a suitable proxy measure for the potential tax benefits which can result from the use of intangible assets by a firm. R&D expenditure is tax deductible and expenditure on R&D projects can significantly reduce the amount of corporate taxes payable by a firm (Dyreng et al., 2008). R&D expenditure is our proxy measure of intangible assets and, due to the unusual nature of these assets and their non-physical form, it makes it easy for firms to transfer these assets or to manipulate prices and the commercial nature of transactions relating to the use of intangible assets. In fact, R&D expenditure may be transferred to a specific tax jurisdiction to maximize tax benefits. Levels of investment in technology or pharmaceuticals for example could be achieved in the most favorable tax jurisdictions, and funding for such projects could also be achieved via the transfer of loans amongst related parties. Falk (2005) examined the factors affecting R&D in a sample of OECD countries. He found two basic instruments driving R&D expenditure: (1) the provision of a tax treatment which is favorable to firms that invest in R&D; and (2) the ability of firms to obtain financing so that they could invest in R&D projects.

[13] The OECD (2006) catalogues 33 tax havens: 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.

[14] Other methods of measuring *THAV* were also included in our base regression model, such as the proportion of tax haven incorporated subsidiaries. However, results were not significant. In the case of the small-to-medium sized firms (i.e. firms with less than AUD600 million total assets at year end), transfer pricing may be assisted greatly through the use of only one tax haven. Our sample comprises around 34 percent of firms which could be regarded as small-to-medium in size.

to fluctuate across different industry sectors (Stewart, 1977; Oyelere and Emmanuel, 1998; Bernard et al. 2006). Stewart (1977) found that transfer pricing aggressiveness is more common for firms operating in the materials and pharmaceuticals industry sectors. Bernard et al. (2006) also found that transfer pricing aggressiveness is used by firms operating in the materials sector. We thus include ten *INDSEC* dummy variables in our study: capital goods, consumer service retail, energy, food, stables and beverage, materials, media, pharmaceuticals and health care, real estate, transport, and utilities.[15] No sign predictions are made for the industry-sector dummies.

4. Empirical results

4.1. Descriptive statistics

Table 2 reports descriptive statistics of the dependent variable (*TPRICE*) and independent variables (*SIZE*, *PROFIT*, *LEV*, *INTANG*, *MULTI* and *THAV*) for the 2009 year. In particular, the dependent variable *TPRICE* shows that the sample firms have a transfer pricing aggressiveness score of around 26.2 percent. *TPRICE* has a range from 0 percent to as high as 75 percent (i.e. six out of the eight transfer pricing aggressiveness items are exhibited).

[Insert Table 2 About Here]

We also present descriptive statistics of the transfer pricing aggressiveness index according to two-digit industry classification (GICS) codes in Table 3. Although there are a greater number of firms represented in industries such as materials (52), energy (38) and consumer service retail (29) in our sample, firms are relatively evenly distributed across all industries, indicating no significant industry bias.

[Insert Table 3 About Here]

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[15] With materials being the omitted sector in our base regression model.

4.2. Correlation results

The correlation results are reported in Table 4. Pearson product-moment correlation coefficients (Spearman rank correlation coefficients) are reported below (above) the diagonal. The results show significant correlations (with predicted signs) between *TPRICE* and *SIZE*, *PROFIT*, *LEV*, *INTANG*, *MULTI* and *THAV* ($p < 0.10$ or better). Table 4 also reports that only moderate levels of collinearity exist between our explanatory variables. Finally, we calculate variance inflation factors (VIFs) when estimating our base regression model to test for signs of multi-collinearity between the explanatory variables. No VIFs exceed five, so multi-collinearity is not problematic in our study (see Hair et al., 2006).

[**Insert Table 4 About Here**]

4.3. Regression results

Table 5 reports our base regression model results.[16] The regression coefficient for *SIZE* is positive and significantly associated with transfer pricing aggressiveness ($p < 0.01$), so H1 is supported by the results: larger firms engage in greater manipulation of transfer prices. The regression coefficient for *PROFIT* is positive and significantly associated with transfer pricing aggressiveness ($p < 0.05$), which supports H2: more profitable firms have the capacity and incentive to engage in transfer pricing aggressiveness. The regression coefficient for *LEV* is positive and significantly associated with transfer pricing aggressiveness ($p < 0.05$), so H3 is supported by the results: firms with higher debt-to-equity ratios are more aggressive in terms of transfer pricing. The regression coefficient for *INTANG* is positive and significantly associated with transfer pricing aggressiveness ($p < 0.05$), which supports H4: intangible assets are utilized

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[16] We note that coefficient estimates are standardized, and standard errors are corrected for all of the regression models reported in this paper based on the White (1980) procedure.

to aggressively transfer profits internationally.[17] The regression coefficient for *MULTI* is positive and significantly associated with transfer pricing aggressiveness ($p < 0.05$), so H5 is supported by the results: the greater the proportion of foreign controlled subsidiaries, the greater the level of transfer pricing aggressiveness. However, the regression coefficient for *THAV* is not significant, so H6 is not supported. For the control variables, the regression coefficients for firms belonging to the capital goods, consumer service retail, energy, food, staples and beverage, media, and pharmaceuticals and healthcare industry sectors are positive and significantly associated with transfer pricing aggressiveness ($p < 0.05$ or better). However, we observe that the regression coefficients for firms belonging to the real-estate, transport and utilities industry sectors are not significant. Our study thus provides evidence of transfer pricing aggressiveness across a broad range of industry sectors.

[Insert Table 5 About Here]

4.4. Additional analysis: interaction effects

Previous research by Jacob (1996), Conover and Nichols (2000), and the Department of The Treasury (2007) in the U.S. suggests that firms are able to augment their aggressive transfer pricing activities several ways, including the use of intangible assets, international operations and tax haven-incorporated subsidiaries. The Department of the Treasury (2007) emphasized that multinational firms are able to exploit differences in tax rates and tax rules to reduce their group tax liabilities and this can be achieved by shifting high-value intangible assets to the most favorable tax jurisdiction. Harris et al. (1993) also found that the tax liabilities of U.S. firms with tax haven subsidiaries is much lower than those U.S. firms without tax haven affiliates. They

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[17] We also constructed a dummy variable for *INTANG* of 1 if the firm incurred R&D expenditure in the 2009 financial year, otherwise 0. Our (unreported) results show that the regression coefficient for *INTANG* based on the dummy variable measure is also significant ($p < 0.05$).

infer these results to be indicative of aggressive transfer pricing of firms with tax haven subsidiaries.[18] We extend previous research on transfer pricing economics and taxation (e.g. Jacob, 1996; Conover and Nichols, 2000; Department of the Treasury, 2007) by considering empirically whether the interaction effects of intangible assets, multinationality and tax haven utilization jointly impact transfer pricing aggressiveness. Specifically, we multiply *MULTI* and *THAV* by *INTANG* to construct interaction terms for use in our extended regression model. Our base regression model in Equation (1) is therefore extended to include the additional interaction terms.

We report the results of this extended analysis in Table 6. The regression coefficient for *MULTI*INTANG* is positive and significantly associated with transfer pricing aggressiveness ($p < 0.05$). However, the regression coefficient for *THAV*INTANG* is not significant. These results provide some empirical support for previous research (e.g. Jacob, 1996; Conover and Nichols, 2000; DoT, 2007) which suggests that firms are able to enhance transfer pricing aggressiveness by means of intragroup transfers of intangible assets amongst foreign controlled firms. In fact, ownership and responsibility for R&D may be centralized in foreign jurisdictions with relatively lower ETRs. The preferential location of intangible assets (e.g. R&D) in higher tax jurisdictions could possibly bring-about a reduction in the Australian corporate tax liabilities for these firms. This may be reflected in the increased flow of intangible assets between variably-taxed jurisdictions, leading to opportunities to engage in transfer pricing manipulation. The regression coefficients for many of our other independent variables (i.e. *SIZE*, *PROFIT*, *LEV*, *INTANG* and *MULTI*) are also positive and significantly associated with *TPRICE* ($p < 0.05$ or better). Finally,

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[18] The case of Microsoft Corporation provides an interesting example of these various interactions. Specifically, Microsoft licensed its software for use in Europe, the Middle East and Africa through an Irish subsidiary. Microsoft received royalty payments that were tax deductible in high-tax jurisdictions and subject to a low rate of tax in Ireland. This particular practice allowed Microsoft to save at least USD500 million in corporate taxes each year (Mutti and Grubert, 2009).

for our control variables, the regression coefficients for *INDSEC* (i.e. *CAPG*, *COSR*, *ENE*, *FSB*, *MEDI* and *PHAH*) are positive and significantly associated with transfer pricing aggressiveness ($p < 0.05$ or better).

[Insert Table 6 About Here]

5. Conclusions

This study examines the major determinants of transfer pricing aggressiveness of publicly-listed Australian firms. Our regression results show that firm size, profitability, leverage, intangible assets and multinationality are significantly positively associated with transfer pricing aggressiveness after controlling for industry-sector effects. Moreover, our additional regression results indicate that firms augment transfer pricing aggressiveness through the joint effects of intangible assets and multinationality.

Whilst enhanced disclosure by firms regarding the pricing and commercial basis of related-party transactions would be helpful from a tax administration viewpoint, the ATO and ASIC are aware of the burden already faced by Australian firms in complying with the complex transfer pricing rules. The quality of documentation about transfer pricing arrangements varies greatly from one firm to another. However, the provision of specific documentation by management in regards to arm's length pricing contributes to a more effective tax administration and greater transparency of the transfer pricing rules to analysts, shareholders and potential investors. This may also assist in reducing a firm's tax compliance burden and the need to book income tax reserves and tax liabilities with respect to anticipated tax audits.

This study is subject to several limitations. First, our sample is drawn from publicly-listed firms because data is not available for private firms. Second, our transfer pricing aggressiveness

index measure is drawn from aggregated financial data at the firm-level, so transactional transfer

pricing data may be obscured within a broader 'noise' of aggregated financial data that could

hinder our ability to isolate specific elements of transfer pricing. It is possible that some firms

may not have disclosed complete details of related party transactions due to materiality reasons,

or because the nature of transactions may not comply with debt covenant arrangements or may

impede a firm from undertaking further capital raisings. However, as we are dealing with

publicly-listed Australian firms, materiality is unlikely to be a major issue in our study.

Moreover, these firms are also likely to address disclosure requirements in accordance with

AASB 124 Related Party Disclosures (AASB, 2008).

Future research could consider the determinants of transfer pricing aggressiveness across

different jurisdictions internationally. We encourage further empirical research in this area.

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Appendix A. Examples of coding of the eight *TPRICE* index items

(1) The existence of interest free loans between related entities:

'Loans provided to jointly controlled and associated entities relates mainly to loans provided to Reach of $191 million (2008: $161 million) and the 3GIS Partnership (3GIS) of $38 million (2008: $33 million). The loan provided to Reach is an interest free loan and repayable on or after 31 December 2010 upon the giving of six month notice by both PCCW Limited and us. We have provided for the non-recoverability of the loan as we do not consider that Reach is in a position to be able to repay the loan amount in the medium term' (Telstra Limited 2009 Annual Report, p. 223).

(2) The existence of debt forgiveness between related entities:

Parent

	'30 June 2009 $'000	30 June 2008 $'000
Loans to related parties		
Loans advanced to:		
Balance at beginning of the year	566,006	514,249
Loans advanced	155,125	51,757
Loans written down	(225,439)	
Intercompany debtors	1,363	–
Loans advanced from:		
Balance at beginning of the year	288,268	227,754
Loans advanced	–	60,514
Loans forgiven on disposal of discontinued operation	(199,373)	–

(Straights Resources 2009 Annual Report p.141)

'Non-assessable debt forgiveness' (Alesco Ltd 2009 Annual Report, p. 69).

'Loan forgiveness income received on inter-company loan forgiveness $100,000' (Alesco Ltd 2009 Annual Report, p. 68).

(3) The existence of impaired loans between related entities:

'Amounts owing by controlled entities: These loans are interest free and at call. During the year an assessment of the recoverable amount was made and an impairment of USD151,407,000 was recorded' (Roc Oil Limited 2009 Annual Report, p. 66).

	'30 June 2009 $'000	30 June 2008 $'000
Related party receivables	79,794	78,294
Impairment allowance for non-recovery of intercompany loans	(58,645)	(58,645)
	21,149	19,649'

(Antares Energy Ltd 2009 Annual Report, p. 39).

(4) The provision of non-monetary consideration (e.g. services or non-liquid assets) without commercial justification between related entities:

'Intercompany loans
The Company provides working capital to its controlled entities. Transactions between the Company and other controlled entities in the wholly owned Group during the year ended 30 June 2009 consisted of:

(i) Working capital advanced by Apex Minerals NL;
(ii) Provision of management and other services by Apex Minerals NL;
(iii) Expenses paid by Apex Minerals NL on behalf of its controlled entities; and
(iv) Cash received by Apex Minerals NL on behalf of its subsidiaries with no bank accounts.

The above transactions were made interest free with no fixed terms for the repayment of principal on the working capital advanced. At balance date amounts receivable from controlled entities totalled $216,347,982 (2008: $114,831,721) and the amounts payable to controlled entities was $413,182 (2008 $413,394)' (Apex Minerals NL 2009 Annual Report, p. 66).

(5)   The absence of formal documentation held by the firm to support the selection and application of the most appropriate arm's length methodologies or the absence of formal documentation relating to transfer pricing between related entities:

'In addition to the bilateral Advanced Pricing Agreement the Group has in place with both the Australian Tax Office and the United States Internal Revenue Service, on 2 July 2009 a unilateral Advanced Pricing Agreement was entered into with the French Taxation Authority in France in relation to the royalty rate used by GSM (Europe) Pty Ltd for the right to use certain Group brands and trademarks. This agreement will cover the period 1 July 2006 to 30 June 2011 and provides certainty for the Group in respect of royalties being paid in accordance with French transfer pricing rules and regulations. Non-existence of a formal policy regarding related party or intra-company transfers of assets, services and funds' (Billabong Ltd 2009 Annual Report, p. 4). This statement resulted in a score of zero (0). The non-existence of a formal policy regarding related party or intra-company transfers of assets, services and funds would result in a score of one (1).

(6)   The disposal of capital assets to related entities without commercial justification:

'On 31 October 2009, Woodside Energy Ltd executed a Sale and Purchase Agreement to dispose of Woodside's 51.55% interest in the Otway project (disposal group), being Exploration Permits Vic/P43 and T/30P and Production Licences Vic/ L23, T/L2, T/L3 and T/34P, to Origin Energy Resources Ltd…….The consideration receivable is $712.5 million, which will be adjusted for transactions that occur between the effective date and the completion date' (Woodside 2009 Annual Report, p. 97). In this example, there is no mention of an arm's length or commercial basis for the sale.

(7)   The absence of arm's length justification for transactions between related entities:

'It is the Consolidated Entity's policy that all transactions with related parties are on normal terms and conditions, except for the loan of $1,387 million shown below. $1,204 million of this loan was made from the Company to Pacific Brands (Australia) Pty Ltd on 6 April 2004 to enable it to acquire Pacific Brands Holdings Pty Ltd and its associated international operations. An additional loan of $250 million was made by the Company to Pacific Brands (Australia) Pty Ltd after the capital raising conducted in June 2009. An impairment loss of $67 million was also recognized on the loan' (Pacific Brands 2009 Annual Report, p. 82).

(8)   The transfer of losses between related entities without commercial justification:

'The entities have also entered into a tax funding agreement under which the wholly-owned entities fully compensate Billabong International Limited for any current tax payable assumed and are compensated by Billabong International Limited for any current tax receivable and deferred tax assets relating to unused tax losses or unused tax credits that are transferred to Billabong International Limited under the tax consolidation legislation. The funding amounts are determined by reference to the amounts recognised in the wholly-owned entities' financial statements' (Billabong International Limited 2009 Annual Report).

Appendix B. Checklist and decision rules for scoring the eight *TPRICE* index items

- Review the following sections of the annual report for details of each of the eight *TPRICE* index items: (1) financial income and expenses note, (2) trade and other receivables note, (3) investments in controlled entities and associated entities notes, (4) trade and other payables note, (5) interest bearing liabilities note, (6) related party transactions, (7) asset disposal, and (8) tax losses.
- With regards to *TPRICE* item 1, in particular review notes relating to interest bearing liabilities and related party transactions. Loans provided from the parent to subsidiaries or vice-versa that are interest-free are scored as 1; otherwise 0.
- With regards to *TPRICE* item 2, review notes relating to receivables, payables, loans and related party transactions. A loan provided to a group member without any requirement to pay back the loan or forgiveness of a intragroup loan without any commercial basis is scored as 1; otherwise 0.
- With regards to *TPRICE* item 3, review notes relating to receivables and loans. The write-down or impairment of loans advanced to group members without commercial justification is scored as 1; otherwise 0.
- With regards to *TPRICE* item 4, review the section on related party transactions, investments in controlled and associate entities. If there is no statement that the services provided or non-monetary assets provided to other group entities is on commercial or arm's length terms, then the transaction is scored as 1; otherwise 0. In a majority of cases, firms will state that a series of assets transferred or services provided is on normal commercial terms which is scored as 0. If a firm states that the transfer of these items is on 'normal terms' without a reference to commercial or arm's-length, then this transaction is scored as 1.
- With regards to *TPRICE* item 5, review the section on governance to see if a formal transfer pricing policy or methodology is described. Then review related party transaction notes to see if a particular transfer pricing method is described. Non-existence of a formal policy regarding related party or intra-company transfers of assets, services and funds is scored as 1, otherwise 0. Some firms describe the existence of a formal transfer pricing arrangement established with the ATO, so this is scored as 0.
- With regards to *TPRICE* item 6, review the notes on asset sale and purchases and related party transactions. If assets are sold among group members with no description that the transaction was undertaken on normal commercial terms, this is scored as 1; otherwise 0.
- With regards to *TPRICE* item 7, review the notes on related party transactions. If transactions are not described as being on normal commercial terms such as a loan between group members, this is scored as 1; otherwise 0.
- With regards to *TPRICE* item 8, review the notes on related party transactions and tax losses. If there have been losses (accounting or tax) transferred among group members, this is scored as 1; otherwise 0.
- Evidence to support a score of 1 can be obtained from both narrative and/or accounting data. For example, a single line item 'Intercompany debt forgiveness' in the financial statements could be used as evidence to support scoring *TPRICE* item 2.
- If an item is deemed not-applicable (e.g. no material intragroup loans), reduce the number of items comprising *TPRICE* accordingly.

Determinants of transfer pricing aggressiveness: Empirical evidence from Australian firms ☆

Table 1
Descriptive statistics – *TPRICE* index items for sample firms.

Variable	Description	Mean
ITEM1	The existence of interest free loans between related entities.	0.469
ITEM2	The existence of debt forgiveness between related entities.	0.103
ITEM3	The existence of impaired loans between related entities.	0.142
ITEM4	The provision of non-monetary consideration (e.g. services or non-liquid assets) without commercial justification between related entities.	0.103
ITEM5	The absence of formal documentation held by the firm to support the selection and application of the most appropriate arm's length methodologies or the absence of formal documentation relating to transfer pricing between related entities.	0.901
ITEM6	The disposal of capital assets to related entities without commercial justification.	0.032
ITEM7	The absence of arm's length justification for transactions between related entities.	0.300
ITEM8	The transfer of losses between related entities without commercial justification.	0.060

N = 183 for all variables.

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Table 2
Descriptive statistics.

Variable	Mean	Std. Dev.	Minimum	Median	Maximum
TPRICE	0.262	0.146	0	0.250	0.750
SIZE	20.704	1.683	16.997	20.526	25.260
PROFIT	1.910	14.069	0	3.570	25.156
LEV	0.622	0.207	0	0.673	1.254
INTANG	1.745	5.041	0	0	18.021
MULTI	0.367	0.290	0.100	0.302	1
THAV	0.390	0.489	0	0	1

Variable definitions: TPRICE = the transfer pricing aggressiveness index ranging 0–100 percent; *SIZE* = the natural logarithm of total assets; *PROFIT* = the natural logarithm of pre-tax income; *LEV* = long-term debt divided by total assets; *INTANG* = the natural logarithm of R&D expenditure; *MULTI* = the total number of foreign subsidiaries divided by the total number of subsidiaries; and *THAV* = a dummy variable, coded 1 if the firm has at least one subsidiary company incorporated in an OECD (2006) listed tax haven, otherwise 0.
N = 183 for all variables.

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Table 3
Descriptive statistics of *TPRICE* index by industry.

Industry	N	Mean	Std. Dev.	Minimum	Median	Maximum
CAPG	18	0.153	0.117	0	0.125	0.375
COSR	29	0.276	0.151	0.125	0.250	0.625
ENE	38	0.273	0.169	0.125	0.250	0.750
FSB	6	0.375	0.137	0.250	0.375	0.625
MAT	52	0.278	0.130	0	0.250	0.625
MEDI	8	0.203	0.647	0.125	0.250	0.250
PHAH	11	0.250	0.137	0	0.250	0.500
REAL	9	0.305	0.141	0.125	0.375	0.500
TRAN	3	0.333	0.191	0.125	0.375	0.500
UTIL	9	0.222	0.136	0	0.250	0.500

Variable definitions: CAPG = capital goods industry dummy; *COSR* = consumer service retail industry dummy; *ENE* = energy industry dummy; *FSB* = food, staples and beverage industry dummy; *MEDI* = media industry dummy; *PHAH* = pharmaceuticals and healthcare industry dummy; *REAL* = real estate industry dummy; *TRAN* = transport industry dummy; and *UTIL* = utilities industry dummy.
The industry classification is based on two-digit GICS codes.

Table 4
Correlation results.

	TPRICE	SIZE	PROFIT	LEV	INTANG	MULTI	THAV
TPRICE	–	0.302***	0.233***	0.238***	0.149**	0.146**	0.116*
SIZE	0.302***	–	0.165**	0.308***	0.092	0.092	0.316***
PROFIT	0.233***	0.164**	–	0.185**	0.067	0.001	0.103
LEV	0.236***	0.295***	0.183**	–	–0.010	0.048	0.217***
INTANG	0.103*	0.083	0.034	–0.012	–	0.199***	0.088
MULTI	0.145**	0.091	0.001	0.046	0.199***	–	0.297***
THAV	0.116*	0.316***	0.103	0.217***	0.088	0.298***	–

Variable definitions: *TPRICE* = the transfer pricing aggressiveness index ranging 0–100 percent; *SIZE* = the natural logarithm of total assets; *PROFIT* = the natural logarithm of pre-tax income; *LEV* = long-term debt divided by total assets; *INTANG* = the natural logarithm of R&D expenditure; *MULTI* = the total number of foreign subsidiaries divided by the total number of subsidiaries; and *THAV* = a dummy variable, coded 1 if the firm has at least one subsidiary company incorporated in an OECD (2006) listed tax haven, otherwise 0.
N = 183 for all variables.
Pearson product-moment correlation coefficients (Spearman rank correlation coefficients) are reported below (above) the diagonal. The *p*–values are one-tailed for directional hypotheses and two-tailed otherwise.
*Significance at the 0.10 level.
**Significance at the 0.05 level.
***Significance at the 0.01 level.

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Table 5
Base regression model results.

Variable	Predicted Sign	Coefficient (Standardized)	Std. Error	t-value
Intercept	?	1.912	1.642	4.82***
SIZE	+	0.262	0.879	2.59***
PROFIT	+	0.135	0.077	1.83**
LEV	+	0.123	0.792	2.33**
INTANG	+	0.061	0.214	1.82**
MULTI	+	0.032	0.152	2.28**
THAV	+	0.021	0.540	0.25
INDSEC:				
CAPG	?	0.202	0.456	2.32**
COSR	?	0.176	0.450	2.10**
ENE	?	0.178	0.959	2.05**
FSB	?	0.211	0.604	2.60***
MEDI	?	0.214	0.291	2.91***
PHAH	?	0.153	0.664	2.27**
REAL	?	0.015	0.514	0.20
TRAN	?	0.003	0.285	0.05
UTIL	?	0.010	0.969	1.32
Adj. R^2 (percent)	13.51%			
F-value	4.00			
(Two-tailed *p*–value)	(0.01)			
N	183			

Variable definitions: *SIZE* = the natural logarithm of total assets; *PROFIT* = the natural logarithm of pre-tax income; *LEV* = long-term debt divided by total assets; *INTANG* = the natural logarithm of R&D expenditure; *MULTI* = the total number of foreign subsidiaries divided by the total number of subsidiaries; *THAV* = a dummy variable, coded 1 if the firm has at least one subsidiary company incorporated in an OECD (2006) listed tax haven, otherwise 0; and *INDSEC* = industry sector dummy variables that take a value of 1 if the firm is represented in the specific GICS category, otherwise 0. Thus: *CAPG* = capital goods dummy; *COSR* = consumer service retail dummy; *ENE* = energy dummy; *FSB* = food, staples and beverage dummy; *MEDI* = media dummy; *PHAH* = pharmaceuticals and healthcare dummy; *REAL* = real estate dummy; *TRAN* = transport dummy; and *UTIL* = utilities dummy.
Standard errors are corrected using the White (1980) procedure. The *p*–values are one-tailed for directional hypotheses and two-tailed otherwise.
*Significance at the 0.10 level.
**Significance at the 0.05 level.
***Significance at the 0.01 level.

Table 6
Extended regression model results – interaction effects.

Variable	Predicted Sign	Coefficient (Standardized)	Std. Error	t-value
Intercept	?	1.903	1.650	4.79***
SIZE	+	0.263	0.883	2.58***
PROFIT	+	0.135	0.077	1.82**
LEV	+	0.119	0.665	2.37**
INTANG	+	0.070	0.278	1.79**
MULTI	+	0.034	0.142	2.21**
THAV	+	0.026	0.629	0.30
MULTI *INTANG	+	0.072	0.769	2.01**
THAV*INTANG	+	0.056	0.680	0.51
INDSEC:				
CAPG	?	0.212	0.560	2.21**
COSR	?	0.175	0.479	2.12**
ENE	?	0.180	0.977	2.07**
FSB	?	0.208	0.661	2.64***
MEDI	?	0.218	0.318	2.83***
PHAH	?	0.154	0.699	2.25**
REAL	?	0.015	0.518	0.20
TRAN	?	0.002	0.329	0.03
UTIL	?	0.010	0.906	1.33
Adj. R^2 (percent)	13.65			
F-value	4.03			
(Two-tailed *p*–value)	(0.01)			
N	183			

Variable definitions: *SIZE* = the natural logarithm of total assets; *PROFIT* = the natural logarithm of pre-tax income; *LEV* = long-term debt divided by total assets; *INTANG* = the natural logarithm of R&D expenditure; *MULTI* = the total number of foreign subsidiaries divided by the total number of subsidiaries; *THAV* = a dummy variable, coded 1 if the firm has at least one subsidiary company incorporated in an OECD (2006) listed tax haven, otherwise 0; *MULTI*INTANG* = an interaction term computed by multiplying *MULTI* by *INTANG*; and *THAV*INTANG* = an interaction term computed by multiplying *THAV* by *INTANG*; and *INDSEC* = industry sector dummy variables that take a value of 1 if the firm is represented in the specific GICS category, otherwise 0. Thus: *CAPG* = capital goods dummy; *COSR* = consumer service retail dummy; *ENE* = energy dummy; *FSB* = food, staples and beverage dummy; *MEDI* = media dummy; *PHAH* = pharmaceuticals and healthcare dummy; *REAL* = real estate dummy; *TRAN* = transport dummy; and *UTIL* = utilities dummy.
Standard errors are corrected using the White (1980) procedure. The *p*–values are one-tailed for directional hypotheses and two-tailed otherwise.
*Significance at the 0.10 level.
**Significance at the 0.05 level.
***Significance at the 0.01 level.