Book-Tax Relations of Large Australian Companies

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Abstract

Using data from the corporate tax transparency reports of entity tax information released by the Australian Taxation Office for the three income years 2013-14 to 2015-16, this study investigates the relations between (a) 'taxable income' in corporate tax return and 'profit before tax' in financial report and (b) 'tax payable' in corporate tax return and 'tax expense' and 'current tax expense' in financial report, as well as other variables that may explain these book-tax relations. This study finds that on average a 1% increase in profit before tax from continuing operations is associated with 0.66% increase in taxable income. On average a 1% increase in tax expense in income statement is associated with 0.71% increase in tax payable in tax return, and a 1% increase in current tax expense is associated with 0.95% increase in tax payable in tax return. Profits from discontinued operations, profits attributable to non-controlling (or minority) interests in the corporate group, the extent of foreign operations and the tax losses carried forward indicator also explain the book-tax relations.

1. Introduction

Firms measure their profit or net income based on two sets of measurement rules: accounting standards and the conceptual framework (financial reporting rules) and income tax law (tax rules). Given that these two sets of measurement rules serve different purposes,[1] they may have different measurement principles, creating book-tax income differences, i.e. the differences between 'profit before tax' in financial report (book income) and 'taxable income' in tax return (tax income). However, as the book income and tax income are based on the same set of economic transactions and events, there should be a close relation between these two numbers.

Using data from the corporate tax transparency reports (CTTRs) of entity tax information released by the Australian Taxation Office (ATO) for the three income years 2013-14 to 2015-16, this study investigates the relations between (a) 'taxable income' in corporate tax return and 'profit before tax' in financial report and (b) 'tax payable' in corporate tax return and 'tax expense' and 'current tax expense'[2] in financial report. Specifically, this study constructs an Income Model and two Tax Models. The Income Model estimates the elasticity[3] of taxable income with respect to profit before tax from continuing operations of large Australian companies with

[1] The primary purpose of financial reporting rules is to provide financial information useful for investors to make and evaluate resource allocation decisions and for other stakeholders to evaluate firms' financial performance, position and cash flows, whereas the major purpose of tax rules is to raise revenue for the government.

[2] 'Current tax expense' is the major component of 'tax expense' that is currently payable. Other components of tax expense include 'deferred tax expense' that is not currently payable.

[3] Elasticity shows the sensitivity or responsiveness of one variable (Y) to a change in another variable (X), and is measured by the percentage change in Y divided by the percentage change in X.

consolidated total income of $100 million or more. Taxable income may differ from profit before tax from continuing operations because, for example, some companies for some year may have profits from discontinued operations which are reported separately on an after-tax basis from profit from continuing operations. Also, accounting consolidation includes wholly- and partly-owned Australian and foreign subsidiaries, whereas tax consolidation only includes wholly-owned Australian subsidiaries. The two Tax Models estimate the elasticity of tax payable with respect to tax expense and current tax expense respectively. In addition to the causes of book-tax income differences, tax payable is different from tax expense because the latter includes deferred tax expense which is not payable within 12 months after the end of the income year.

The results of the Income Model show that on average a 1% increase in profit before tax from continuing operations is associated with 0.66% increase in taxable income. The results of the Tax Models show that on average a 1% increase in tax expense in income statement is associated with 0.71% increase in tax payable in tax return, and a 1% increase in current tax expense is associated with 0.95% increase in tax payable in tax return. Other factors that explain these book-tax relations include profits from discontinued operations, profits attributable to non-controlling (or minority) interests in the corporate group, the extent of foreign operations and tax losses carried forward.

This study contributes to the literature in the following ways. First, this study provides a tool for investors, investment analysts, corporate regulators and tax authorities to

detect excessive book-tax differences which may indicate manipulation of accounting profits and/or taxable income. Prior studies, such as Desai (2003), attribute the increasing gap between book income and tax income[4] to corporate tax avoidance. Also, capital market research (e.g. Lev and Nissim, 2004; Hanlon, 2005; Ayers et al., 2009) highlight the importance of book-tax differences when assessing the quality and reliability of earnings or book income. Second, this study extends the literature of book-tax differences by investigating the relation between tax numbers in tax returns and accounting numbers in the financial statements. Most of previous empirical studies use different versions of effective tax rate (ETR) to capture book-tax differences due to the unavailability of tax return data.

The remaining sections are organised as follows. Section 2 reviews the relevant literature of book-tax differences. Section 3 develops the hypotheses to be tested in this study. Section 4 explains the research design of this study. Section 5 reports the descriptive statistics and main regression results, and section 6 concludes this paper.

2. Literature review

Book-tax income difference is a research area that has been widely studied.[5]

Tran (2015) points out that a common method of estimating taxable income from financial statements is to gross-up the current tax expense by the applicable statutory

[4] This increasing gap is reflected by the cases that profitable firms report little or no taxable income to tax office or that firms increase their accounting profit without the increase of their current tax liabilities (Mills and Plesko, 2003).

[5] For a review of studies in the United States, see Hanlon and Heitzman (2010).

tax rate (STR). However, four sources of book-tax differences create problems associated with inferring a firm's actual tax liability and taxable income from current tax expense. First, some firms report a profit or loss after tax from discontinued operations, but they do not disclose the tax expense and current tax expense related to discontinued operations in the income tax note to financial statements, so that grossing up current tax expense only gives taxable income from continuing operations. The second source is the presence of tax offsets, including franking credit, research and development and foreign income tax offsets. The presence of tax offsets means that current tax expense divided by STR may not equal to taxable income. The third source is the difference between tax consolidation rules and accounting consolidation rules. According to accounting standards, consolidation is required when a parent company has control over its subsidiary companies (normally when its equity ownership percentage is more than 50%). However, for tax purposes, consolidation can be irrevocably elected when the parent has 100% ownership of its Australian subsidiaries. Divergence between accounting and tax consolidation rules makes book income of an Australian firm different from its taxable income because book income includes profits before tax of domestic subsidiaries with more than 50% but less than 100% ownership and foreign subsidiaries with more than 50% ownership, while taxable income does not. The last source of differences is tax cushion,[6] of which information is not available to the public, even though firms with an annual turnover over above $250 million are

[6] Tax cushion is an uncertain tax liability, e.g. due to a tax dispute or taking an aggressive tax position, that has been accrued as part of current tax expense.

required to report any reportable uncertain tax positions to the ATO. Unfortunately, there is no way to estimate tax cushions related to current and prior periods included in current tax expense.

A number of Australian empirical studies on book-tax income differences (e.g. Harries and Feeny, 2003; Tran and Yu, 2008; Ikin and Tran, 2013) have mainly focused on estimating the divergence of ETR from the STR. With the access of tax payable data in corporate tax return, Harris and Feeny (2003) find that lower ETRs are associated with higher level of foreign income, R&D expenditure, and capital intensity. Tran and Yu (2008) explore how firms' characteristics, such as their size and industry affiliation, affect their ETR.[7] They find that Technology Hardware and Equipment industry has relatively large book-tax differences because high-technology firms are likely to be capital intensive and have a large amount of research and development expenditure, which attracts tax deductions and concessions. Tran and Yu (2008) also find that the relation between firm size and ETR is nonlinear: medium-size firms have the highest ETR.

However, there have been no previous Australian empirical studies that focus on measuring the differences between accounting numbers (profit before tax, tax expense and current tax expense) and tax numbers (taxable income and tax payable) due to the absence of tax return data. Using recently released tax return data in CTTRs, this study

[7] Tran and Yu (2008) use tax expense divided by pre-tax accounting profit to calculate ETR, which captures all permanent differences. They also use current tax expense divided by pre-tax accounting profit to capture both permanent and temporary differences.

extends the literature by measuring the relation between tax numbers in tax returns and accounting numbers in the financial reports.

3. Hypotheses development

3.1 The relation between book income and tax income

This study first investigates the relation between profit before tax and taxable income as well as the main factors causing the divergences between book income and tax income.

Both profit before tax and taxable income measure the net income from a firm's business operations. Profit before tax is measured by financial reporting rules, while taxable income is measured by tax rules. They are related to each other because both of them reflect the same sets of economic transactions and events in business operations. Therefore, profit before tax is expected to have a strong positive association with taxable income. This leads to Hypothesis 1a:

> ***H1:*** *Taxable income is positively associated with profit before tax after controlling for major categories of book-tax income differences.*

Although profit before tax and taxable income are closely related to each other, in most cases there are divergences between the two.

The first source of divergences is due to the presentation of discontinued operations in the consolidated income statement or statement of profit or loss under the Australian

accounting standards. According to Australian Accounting Standard AASB 101 *Presentation of Financial Statements*, the reporting entity first presents profit *before* tax which is from continuing operations only. After subtracting income tax expense related to the profit from continuing operations, the net amount is profit *after* tax from continuing operations. Profit (or loss) *after* tax from discontinued operations is then presented as a separate line item, followed by the total profit (or loss) *after* tax from continuing and discontinued operations. Therefore, it is usually impossible to working out the total profit *before* tax from both continuing and discontinued operations. However, profits from both continuing and discontinued operations are subject to income tax and can be taxable income under tax law. Therefore, if a profit (or loss) *after* tax from discontinued operations is reported in a firm's income statement, the profit *before* tax is likely to be understated by the profit before tax from discontinued operations (or overstated by the loss from discontinued operations) when compared to taxable income in tax return. This leads to Hypothesis 2a:

H2a: *Taxable income is positively (negatively) associated with profit (loss) after tax from discontinued operations.*

The second source of book-tax income differences is the different consolidation rules between financial reporting[8] and tax law.[9] Consolidation rules under Australian

[8] Australian Accounting Standard AASB 10 *Consolidated Financial Statements*.

[9] Consolidation rules under tax law refer to Part 3-90 of Income Tax Assessment Act 1997. In Australia, tax consolidation is elective, not mandatory. Based on a sample of 604 firms in 2007, Tran (2015) found that over 91 percent of firms elected tax consolidation, only 3 percent did not so elect. Four percent of firms did not have wholly-owned subsidiaries resident in Australia hence tax consolidation was not relevant. The remaining 1.5 percent had wholly-owned Australian subsidiaries but did not indicate whether or not they elected tax consolidation. Tax consolidation, once elected, is irrevocable.

accounting standards require a firm to consolidate all its Australian and foreign subsidiaries controlled by the ultimate parent of the group. However, Australian taxation law only allows an Australian head company to include wholly owned Australian subsidiaries in the tax consolidated group. This means that a group's taxable income does not include the taxable income of domestic subsidiaries that are not wholly owned by the parent and the taxable income of all foreign subsidiaries controlled by the parent of the group. Therefore, even if a firm only operates in Australia, the presence of non-controlling interests [10] in the consolidated profit [11] suggests that the consolidated profit will exceed the taxable income of the group because the parent's interest in the profits of non-wholly owned subsidiaries are not included in tax consolidation. This leads to Hypothesis 2b as follows.

H2b: *Taxable income is negatively associated with the non-controlling interests in the group's profit after tax.*

Moreover, if a firm also operates outside Australia and has foreign subsidiaries, the consolidation differences that result from the exclusion of all foreign subsidiaries under tax consolidation rules mean that group taxable income in tax return further falls short of consolidated profits of the group. Besides consolidation differences, Australian tax law also exempts the overseas business income generated by an Australian company

[10] Non-controlling interests, or minority interests, refer to the equity interests in subsidiaries that are not owned by the parent.

[11] In the consolidated income statement, firms report the total profit or loss after tax from continuing and discontinued operations and split it into profit or loss attributable to non-controlling (or minority) interests and profit or loss attributable to owners of the parent.

from its foreign branches[12] and dividends received from foreign subsidiaries[13] from Australian income tax. Therefore, the group taxable income reported in Australian tax return may exclude a firm's profit from foreign sources, whereas its consolidated profit in income statement includes the profits from all sources, leading to a book-tax income difference. This leads to Hypothesis 2c below.

H2c: *Taxable income is negatively associated with the extent of foreign operations.*

In addition, tax losses carried forward is another potential source of divergences. In financial reporting, a loss for a prior period does not affect the profit for the current period. However, under tax law, the tax losses incurred in previous periods can be claimed as a deduction in the current period and reduce the taxable income for the current period. This leads to Hypotheses 2d:

H2d: *Taxable income is negatively associated with the presence of tax losses carried forward.*

Finally, the disclosure of a contingent tax liability[14] in the directors' report and/or a note to financial statements might also signal a difference between book income and

[12] Business income from a foreign branch of an Australian company is non-assessable non-exempt income under section 23AH of the Income Tax Assessment Act 1936.

[13] Non-portfolio dividends paid by a foreign subsidiary to its Australian parent are non-assessable non-exempt income under subdivision 768-A of the Income Tax Assessment Act 1997.

[14] Australian Accounting Standard AASB 137 *Provisions, Contingent Liabilities and Contingent Assets* defines a 'contingent liability' as either a possible obligation that arises from past events and whose existence will be confirmed only by the occurrence or non-occurrence of one or more uncertain future events not wholly within the control of the entity, or a present obligation that arises from past events but fails the criteria for recognition as a liability or provision because it is not probable that an outflow of economic resources will be required to settle the obligation, or the amount of the obligation cannot be measured reliably. AASB 137 requires contingent liabilities to be disclosed, unless the possibility of an outflow of resources embodying economic benefits is remote.

tax income. For example, if the law is unclear whether certain profit X is taxable or not and the firm decides to take the position that the profit is not taxable and report a smaller taxable income in tax return, then its taxable income will be smaller than the accounting profit by X, and its tax payable is 0.3X smaller than tax expense and current tax expense. The company may disclose a contingent tax liability if it thinks that there is a chance (though less than 50%) that it may be required to pay additional tax if the profit X is eventually proved to be taxable. Therefore, a contingent tax liability disclosed in the financial report might indicate the firm's aggressive tax position resulting in a potential understatement of taxable income in the tax return. This leads to Hypothesis 2e as follows.

H2e: *Taxable income is negatively associated with the presence of a contingent tax liability.*

3.2 The relation between tax expense and tax payable

This study also investigates the relations between tax payable in tax return and tax expense and current tax expense in financial report, as well as the sources of difference between the two.

In the absence of tax return data, tax expense and current tax expense have been used in previous studies as proxies for tax payable in tax return to investigate whether firms pay their fair share of tax (e.g. Tran and Yu 2008; Ikin and Tran 2013). Australian Accounting Standard AASB 112 *Income Taxes* requires a reporting entity to disclose a

breakdown of its tax expense into major components: current tax expense (the major portion of tax expense that is currently payable), deferred tax expense (the portion of tax expense that is not payable currently) and other adjustments.[15] Theoretically, current tax expense is the amount after adjusting for the tax effects of permanent and temporary book-tax income differences[16] and is conceptually the equivalent of tax payable in tax return (Tran 1998).[17] Therefore, this study predicts a strong positive association between tax payable and tax expense (current tax expense). This leads to Hypothesis 3 below.

H3: *Tax payable in tax return is positively associated with tax expense (current tax expense) in financial report after controlling for the tax effect of major categories of book-tax income differences.*

Similar to hypothesis 2a, profit or loss from discontinued operations may affect tax payable and create a gap between tax expense (current tax expense) and tax payable. When disclosing the breakdown of tax expense into current tax expense and other components in the income tax note to the financial statements, some firms take discontinued operations into consideration, while others do not, because Australian

[15] See paragraph 80 of AASB 112 for examples of other adjustments. However, Australian companies that are not listed on the Australian Securities Exchange may claim that they are not reporting entity and their financial reports are not general purpose financial reports, so they are not required to disclose current tax expense in the income tax note to financial statements.

[16] According to AASB 112, a temporary difference is the difference between the carrying amount of an asset or a liability in the balance sheet and its tax base (i.e. its value of for tax purposes.) A temporary difference gives rise to a future taxable amount or a future deductible amount when it reverses, hence a deferred tax liability or a deferred tax asset. AASB 112 no longer defines 'permanent difference' which refers to a book-tax difference that will not reverse over time.

[17] Tran (1998) refers to the old Australian accounting standard for income taxes which adopted an income statement approach as opposed to the balance sheet approach adopted by the current AASB 112, but the concept of timing difference in income or expense can be easily related to the concept of temporary difference in asset or liability.

accounting standards are ambiguous in this respect (Tran 2015).[18] However, tax payable in corporate tax return is the total tax liability incurred by a firm, regardless of their financial classification into continuing and discontinued operations. Therefore, tax expense and current tax expense in the financial report may not reflect the total tax a firm owned to the ATO due to the possible exclusion of tax on the profit from discontinued operations. If a profit (or loss) after tax from discontinued operations is reported in a firm's income statement, tax expense and current tax expense are likely to be understated (or overstated) when compared to tax payable in tax return.

H4a: *Tax payable is positively (negatively) associated with profit (loss) after tax from discontinued operations.*

As explained in the development of hypothesis 2b, different accounting and tax consolidation rules cause the consolidated profit to be higher than the taxable income of a group because the taxable income of non-wholly owned subsidiaries are not included in tax consolidation. Tax payable is calculated on the basis of taxable income. Therefore, like the negative relation between non-controlling interests and taxable income, tax payable is also negatively associated with the presence of non-controlling interests in the group's profit or loss after tax. This leads to Hypothesis 4b as follows.

[18] If financial reports are available, instead of using the tax expense reported in the income statements, this study uses tax expense disclosed in the income tax note to the financial statements to ensure that tax expense and current tax expense (only disclosed in the income tax note) are on the same basis. Tax expense in the income statement as downloaded from the Orbis database is still used for firms without financial reports available (mainly foreign-owned Australian companies).

H4b: *Tax payable is negatively associated with the presence of non-controlling interests in the group's profit or loss.*

As explained earlier, foreign-sourced business profit of an Australian company is most likely not Australian taxable income. If exemption does not apply, foreign income tax offset[19] will apply to avoid double taxation. Therefore, foreign operations also reduce tax payable in Australian tax return. This leads to Hypothesis 4c below.

H4c: *Tax payable is negatively associated with the extent of foreign operations.*

In addition, given that tax losses incurred in previous periods can be claimed as a deduction in the current period to reduce taxable income and thus tax payable for the current period, tax losses carried forward are expected to have a negative association with tax payable. This leads to Hypothesis 4d:

H4d: *Tax payable is negatively associated with the presence of tax losses carried forward.*

Finally, if a firm takes an aggressive tax position and report a smaller amount of tax payable in its tax return than what would have been in the absence of the aggressive tax position, it may disclose the presence of a contingent tax liability in the directors' report and/or a note to the financial statements. Thus, the presence of a contingent tax liability

[19] Detailed rules for foreign income tax offsets are explained in division 770 of the Income Tax Assessment Act 1997.

may signal that the tax payable in tax return may have been understated. This leads to Hypothesis 4e below.

H4e: *Tax payable is negatively associated with the presence of contingent tax liability.*

4. Research design

4.1 Data source and sample selection

Due to data constraint, this study only covers a three-year period: 2013-14 to 2015-16 income years for which ATO has released information about taxable income and tax payable of large Australian companies with total income of $100 million or more.

The total income, taxable income and tax payable data in corporate tax returns are collected from the ATO's CTTRs for both public companies (PCs)[20] and foreign owned Australian companies (FOACs) from 2013-14 to 2015-16 income years. The financial data for the three years are collected from multiple sources. Data including firms' characteristic data[21] and financial data[22] disclosed in the balance sheet and the income statement are directly downloaded from the Orbis database. Other financial data that are not available on the Orbis database[23] are manually collected from the firms'

[20] Public company (PC) in Australian tax law mainly refers a company listed on a stock exchange or a subsidiary of a listed company.
[21] Firms' characteristic data includes firms' balance sheet date and industry code.
[22] Financial data directly downloaded from Orbis database include 'profit before tax', 'total profit after tax', 'fixed assets', 'total assets', 'tax expense' and 'R&D expenditure'.
[23] 'Current tax expense', 'profit or loss from discontinued operations', 'profit or loss attributable to non-controlling interest', 'foreign non-current assets' or 'foreign total assets', information about tax losses carried forward and contingent tax liability are manually collected from annual reports. 'Tax expense' is manually collected from notes to financial statements for firms with annual reports available. Otherwise, it is directly downloaded from Orbis database.

annual reports, which are downloaded from DatAnalysis Premium and Connect4 for PCs and purchased from the Australian Securities and Investments Commission (ASIC) for FOACs.[24]

The sample for this study is restricted to large Australian companies that have total income of $100 million or more and whose total income, taxable income and tax payable in tax returns for 2013-14, 2014-15 and 2015-16 income years are made available in the CTTRs released by the ATO. The initial sample consists of 1,588 entities for the 2013-14 income year, 1,963 entities for the 2014-15 income year and 2,043 entities for the 2015-16 income year. Several sample selection criteria are employed in this study. First, domestic-owned private companies are excluded from the sample due to the lack of financial data. Second, only companies with positive taxable income or positive tax payable are included in this study. ATO only discloses the total income if a firm does not have taxable income and tax payable (e.g. when the firm has a tax loss). In that case, the firm is excluded from the study because of missing dependent variables in both the Income Model and the Tax Models. Third, entities which are not companies or are owned by governments are excluded from the sample, such as listed trusts, credit unions, limited partnerships, and companies owned by

[24] The income year for tax purposes and the normal accounting period in Australia is a year ending on 30 June. However, for various reasons, the ATO may allow some companies to adopt different balance dates. According to the practice of ATO, the dividing date is 1 December. A company that adopts a balance date between 1 January and 30 November will have its income year for tax purposes matched with the accounting period ending in the same calendar year. For any balance date ended during December, the company will have its income year for tax purpose matched with its accounting period ending in the previous calendar year. Therefore, for companies whose balance date is between 1 January and 30 November, annual reports for accounting periods ending in 2014 to 2016 are downloaded or purchased. For companies whose accounting period ends in December, annual reports for accounting periods ending in 2013 to 2015 are downloaded or purchased.

governments at different levels. After these steps, this study matches the tax dataset from CTTRs with financial dataset downloaded from the Orbis database. The number of observations decreases further because there are observations where no matching financial data are available on the Orbis database, including banks and insurance companies that are subject to different financial reporting requirements. The final sample includes 2,716 firm-year observations.[25] The process of sample selection is summarised in Table 1.

[Insert Table 1 here]

4.2 Regression models

This study constructs an Income Model and two Tax Models that are pooled ordinary least squares (OLS) regression models. Although the problem of heteroscedasticity exists,[26] this study does not employ panel data analysis (firm fixed effects models) for the following two reasons. First, the panel data are unbalanced. On average, a firm only has 2.1 yearly observations. Given that the omitted yearly observations may be systematic due to the exclusion of zero or negative value of the main variables after logarithm transformation or due to the total income falling below the $100 million threshold, the estimated coefficients from fixed effects models may be biased. Second, the sample correlation between the firm fixed effects and the regressors are not high

[25] The number of firm-year observations for variables that are manually collected from financial reports is smaller than the number of observations in the full sample because, due to resource constraints, only the annual reports of 200 FOACs for the three years are purchased from ASIC.

[26] The presence of heteroscedasticity is due to the fact that a firm may have up to three years of data in the dataset so the errors are auto-correlated between yearly observations of a same firm.

according to unreported results of fixed effects models. This indicates that although the pooled OLS regression models ignore the firm fixed effects, its estimated coefficients are unlikely to exhibit large biases. Instead, this study uses the cluster robust-variance option for all regression models to relax the independent errors assumption in a limited way when errors are correlated within subgroups or clusters of data.

The Income Model represented by equation (1) (for firm *i* and year *t*) is used to estimate the relation between taxable income of large Australian companies, both PCs and FOACs, on the one hand, and profit before tax (from continuing operations) and other financial statement variables on the other.

$$lTaxInc_{i,t} = \beta_0 + \beta_1 lProfBTax_{i,t} + \beta_2 ProfDiscR_{i,t} + \beta_3 ProfNCIR_{i.t} + \beta_4 FOP_{i,t} + \beta_5 FOAC_i + \beta_6 LossCFi_{i.t} + \beta_7 ContTLi_{i,t} + \beta_8 CapInt_{i,t} + \beta_9 R\_DExpR_{i,t} + \beta_{10} lTotAss_{i,t} + \beta_{11-28} Ind_i + \beta_{29-30} Year_t + \varepsilon_{i,t} \quad (1)$$

Two Tax Models represented by equations (2) and (3) describe the relation between tax payable on the one hand, and tax expense, or current tax expense, and other financial statement variables on the other.

$$lTaxPay_{i,t} = \beta_0 + \beta_1 lTaxExp_{i,t} + \beta_2 ProfDiscR_{i,t} + \beta_3 ProfNCIR_{i,t} + \beta_4 FOP_{i,t} + \beta_5 FOAC_i + \beta_6 LossCFi_{i.t} + \beta_7 ContTLi_{i,t} + \beta_8 CapInt_{i,t} + \beta_9 R\_DExpR_{i,t} + \beta_{10} lTotAss_{i,t} + \beta_{11-28} Ind_i + \beta_{29-30} Year_t + \varepsilon_{i,t} \quad (2)$$

$$lTaxPay_{i,t} = \beta_0 + \beta_1 lCTaxExp_{i,t} + \beta_2 ProfDiscR_{i,t} + \beta_3 ProfNCIR_{i,t} + \beta_4 FOP_{i,t} + \beta_5 FOAC_i + \beta_6 LossCFi_{i.t} + \beta_7 ContTLi_{i,t} + \beta_8 CapInt_{i,t} + \beta_9 R\_DExpR_{i,t} + \beta_{10} lTotAss_{i,t} + \beta_{11-28} Ind_i + \beta_{29-30} Year_t + \varepsilon_{i,t} \quad (3)$$

The definitions of variables in both the Income Model and Tax Models are shown in Table 2.

[Insert Table 2 here]

4.3 Variables of interest

4.3.1 Dependent variables

lTaxInc in the equation (1) (i.e. Income Model) is the natural logarithm of taxable income disclosed in the ATO's CTTRs. *lTaxPay* in the equations (2) and (3) (i.e. Tax Models) is the natural logarithm of tax payable disclosed in the ATO's CTTRs.

The distributions of 'taxable income' and 'tax payable' in the dataset are very skewed with heavy right tails. Therefore, this study adopts logarithm transformation to generate two dependent variables with approximate normal distribution, so that the regression results are meaningful.

4.3.2 Independent variables

Logarithm transformation also applies to three main independent variables: profit before tax (from continuing operations), tax expense and current tax expense to make the very skewed data closer to normal distribution. Therefore, the sample of this study only includes large and profitable Australian firms.[27] The main independent variable, *lProfBTax*, in equation (1) is the natural logarithm of profit before tax (from continuing operations) in the income statement. A strong positive association between *lProfBTax* and *lTaxInc* will supports hypothesis 1. The main independent variable, *lTaxExp*, in equation (2) is the natural logarithm of tax expense. Where financial reports are available, tax expense data are manually collected from the tax note to the financial statements instead of from the income statement so that tax expense and current tax expense are on the same basis and are more consistent with *lTaxPay* which is related to both continuing and discontinued operations. The main independent variable, *lCTaxExp*, in equation (3) is the natural logarithm of current tax expense, which is disclosed in the tax note to financial statements in a general purpose financial report and is manually collected. According to hypothesis 3, this study predicts strong positive associations between *lTaxPay* on the one hand and *lTaxExp* and *lCTaxExp* on the other.

ProfDiscR in the three models is the ratio of profit or loss from discontinued operations after tax to the total profit after tax in the income statement.[28] It captures any

[27] Firms reporting a loss after tax in income statement (despite having taxable income or tax payable) are excluded from the sample because logarithm can only be computed for a positive number.

[28] This study chooses to use a ratio, *ProfDiscR*, to measure the relative size of profit or loss after tax from discontinued operations in order to keep the negative or zero value of profit or loss from discontinued operations, as logarithm transformation would eliminate all negative and zero value.

differences between profit before tax (from continuing operations only) and taxable income and between tax expense (current tax expense) and tax payable due to the presence of profit or loss after tax from discontinued operations. According to hypothesis 2a and 4a, *ProfDiscR* is expected to be positively associated with *lTaxInc* and *lTaxPay* respectively in the three models.

Two variables are used to capture book-tax differences due to consolidation and foreign operations. The first variable is *ProfNCIR* which is the ratio of profit or loss after tax attributable to non-controlling interests to total profit after tax.[29] Negative relations between *ProfNCIR* and two dependent variables, *lTaxInc* and *lTaxPay*, will support hypothesis 2b and 4b. The second variable, *FOP*, captures the relative size of foreign operations by foreign subsidiaries that can be consolidated for financial reporting purposes, but not for tax purposes. It also captures the extent of foreign operations that attract foreign income exemption and foreign income tax offsets. *FOP* is measured by the ratio of foreign non-current assets to total non-current assets.[30] Previous studies (e.g. Manzon and Plesko, 2002; Harris and Feeny, 2003; Lisowsky, 2009) mainly use foreign income as a proxy for foreign operations. However, in this study it is argued that it is more reliable to use foreign non-current assets rather than foreign income as a proxy for foreign operations, because the so-called 'foreign income', which is based on the location of customers, can still have an Australian source and is subject to

[29] This study chooses to use a ratio, *ProfNCIR*, in order to keep the negative or zero value of profit or loss attributable to non-controlling interests, as logarithm transformation eliminates all negative and zero value.

[30] Alternatively, *FOP* is measured by the ratio of foreign total assets to total assets if foreign total assets are disclosed in the segment report instead.

Australian tax if a firm mainly operates and manufactures its goods or provides its service in Australia. Based on hypothesis 2c and 4c, *FOP* is expected to be negatively associated with two dependent variables.

The indicator variable, *LossCFi*, takes the value of "1" if a firm has tax losses carried forward disclosed in its financial report, and "0" otherwise. A negative regression coefficient for *LossCFi* in both the Income Model and Tax Models will support hypothesis 2d and 4d.

The indicator variable, *ContTLi*, takes value of "1" if any contingent tax liability is mentioned in the director's report, or in a note to the financial statements, and "0" otherwise.[31] *ContTLi* is predicted to have negative associations with *lTaxInc* and *lTaxPay* respectively based on hypothesis 2e and 4e.

In addition, a FOAC indicator (*FOAC*), taking the value of "1" if the firm is a FOAC and "0" if the firm is a PC, is included in both the Income Model and Tax Models to see whether there is any difference in book-tax relations between FOACs and PCs.[32]

[31] In Australia, firms disclose their contingent tax liabilities inconsistently in their financial reports: some firms disclose contingent tax liabilities in number, whereas other firms only report that they have contingent tax liabilities. Therefore, to ensure consistency of measurement, an indicator variable is used.

[32] Note that the purpose of *FOAC* in both Income Model and Tax Models is not intended to test cross-border profit shifting activities. Cross-border profit shifting cannot be detected by this indicator variable in the three models because schemes used to shift profit reduce both profit before tax and tax expense in financial report and taxable income and tax payable in tax return and will not enlarge the book-tax differences investigated by this study.

4.3.3 Control variables

Five control variables are included in both the Income and Tax Models. The regression coefficient of *CapInt* captures the effect of firms' capital intensity on taxable income and tax payable. *CapInt* is measured by the ratio of non-current assets to total assets. Capital intensity of a firm may result in taxable income lower than profit before tax because of the different depreciation methods used in compute profit and taxable income.[33] Similarly, capital intensity is also expected to have a negative effect on tax payable. Therefore, the signs of the regression coefficient of *CapInt* are expected to be negative in both the Income Model and Tax Models.

The regression coefficient of *R_DExpR* captures the effect of firms' research and development (R&D) intensity on taxable income and tax payable. This variable is measured by the ratio of R&D expenditure to total income. In Australia, tax law provides a tax offset for eligible R&D expenditure to encourage large companies to engage in R&D activities that can benefit the economy.[34] Therefore, this study predicts the signs of the regression coefficient of *R_DExpR* to be negative.

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[33] Firms that have a higher proportion of depreciable assets in total assets (i.e. more capital-intensive) tend to have larger amount of depreciation and amortisation expenses. Firms usually adopt the straight-line method of depreciation for financial reporting purposes. However, they tend to choose diminishing value method to compute depreciation for tax purposes to maximize the present value of tax deductions (see Carlon et al, 2013; Ikin and Tran, 2013). This may result in taxable income lower than accounting profit in the earlier years of the lives of depreciable assets. Although the temporary difference will reverse over time, the reversal may be deferred by business growth. The more a firm is capital-intensive, the higher will be the temporary differences between the carrying amounts and the tax bases of depreciable assets, and hence the higher will be the difference between accounting depreciation (hence accounting profit) and tax depreciation (hence taxable income).

[34] This tax incentive is either a refundable tax offset at 43.5% for the first 100 million Australian dollars of eligible expenditure for eligible entities with an aggregated group turnover of less than 20 million Australian dollars, or a non-refundable tax offset at 38.5% for the first 100 million Australian dollar of eligible expenditure for all other eligible entities.

Firm size measured by the natural logarithm of total assets (*lTotAss*) is also included as a control variable. Larger firms are expected to have higher taxable income and tax payable. Further, larger firms are likely to pay proportionately more taxes than smaller firms due to government scrutiny (e.g. more frequent tax audits) and political attention (Zimmerman, 1983). In Australia, large Australian listed companies are also more likely to pay corporate income tax to frank their dividends to meet their shareholders' demand for franked dividends. Therefore, this study expects *lTotAss* to have positive relations to both *lTaxInc* and *lTaxPay*.

A set of industry indicators is also included as control variables. Firms in the final sample are divided into 19 industry groups based on the Australian and New Zealand Standard Industrial Classification (ANZSIC) code.[35] Eighteen industry dummy variables (*Ind*) are used to control for different tax preferences provided to different industries in comparison with the base industry, namely, Agriculture, Forestry and Fishing (industry group 1). Two year dummy variables (*Year*) are included to control for any changes in tax law and general economic conditions between the income years 2014-15 and 2015-16 and the base income year 2013-14.

5. Empirical results

5.1 Descriptive statistics

[35] For firms whose ANZSIC codes are not available on the Orbis database, the NACE industry code (used in Europe) on the Orbis database is used to derive the division-level ANZSIC code.

Table 3 reports the descriptive statistics of all continuous variables included in equations (1) to (3). The number of firm-year observations for variables that are manually collected from financial reports is smaller than the number of observations in the full sample because only the annual reports of 200 FOACs for three years are purchased from ASIC due to resource constraints. The number of firm-year observations for the variable 'current tax expense' is even smaller because some FOACs claim that their financial reports are special purpose financial reports so they do not follow the disclosure requirements in Australian accounting standards to disclose current tax expense.

[Insert Table 3 here]

According to the descriptive statistics, the mean of *lTaxInc* is approximately 16.85, while the average of *lProfBTax* is nearly 16.98. The mean of *lTaxPay* is nearly 15.57, while the average of *lTaxExp* and of *lCTaxExp* is approximately 15.70 and 16.32, respectively. Thus, on average, book-tax differences are not large. The distribution of the two dependent variables and three main independent variables are closer to the normal distribution after the logarithm transformation.[36]

The mean *ProfDiscR* is nearly 0.06, and the mean *ProfNCIR* is nearly 0.02. The full sample also reports an average of 5.9 percent of foreign operations (*FOP*). For other

[36] After logarithm transformation, the skewness of these five variables are close to zero and the kurtosis of these five variables are also reasonable.

variables, the mean of *CapInt* is nearly 0.46. The average *R_DExpR* is approximately 0.003.[37] The average of *lTotAss* is nearly 19.66.

Table 4 reports the descriptive statistics for three indicator variables included in equations (1) to (3).

[Insert Table 4 here]

Only 1.2 percent of the observations report the existence of contingent tax liability (*ContTLi* = 1). Nearly 39 percent of the observations report tax losses carried forward (*LossCFi* = 1) in their financial reports. Nearly 70 percent of the observations in the sample are FOACs (*FOAC* = 1). Table 5 and 6 report the detailed distribution of the number of PCs and FOACs across three years and 19 industry groups, respectively.

[Insert Table 5 here]

The full sample contains 828 firm-year observations related to PCs and 1,888 firm-year observations related to FOACs, representing 364 PCs and 846 FOACs over the three income years 2013-14 to 2015-16. It is obvious that the number of FOACs in the full sample is more than double the number of PCs.

[Insert Table 6 here]

The largest proportion of observations comes from Manufacturing (industry group 3), while the smallest comes from Education and Training (industry group 16). Wholesale

[37] Note that the minimum value of *R_DExpR* is -0.03. This negative value comes from a firm that has a research and development recharge.

Trade (industry group 16) has the largest number of FOACs, and Manufacturing (industry group 3) has the largest number of PCs. Education and Training (industry group 16) has the smallest proportion of FOACs, and no PCs falls in Public Administration and Safety (industry group 15).

5.2 Correlation analysis

Table 7 reports the correlation matrix of all continuous variables included in equations (1) to (3).

[Insert Table 7 here]

According to the correlation matrix, *lTaxInc* has a positive correlation with *lTaxPay* (the correlation coefficient = 0.946 ($p < 0.05$)). This strong correlation is reasonable because tax payable is computed on the basis of taxable income. *lProfBTax* is positively associated with *lTaxInc* ($p < 0.05$). Similarly, *lTaxExp* and *lCTaxExp* are positively correlated with *lTaxPay* ($p < 0.05$). The correlation coefficient of 0.878 ($p < 0.05$) provides initial support for the notion that current tax expense is a very strong proxy for tax payable on the tax return. The correlation coefficient of 0.884 ($p < 0.05$) between *lCTaxExp* and *lTaxExp* indicates that current tax expense is the major component of tax expense. The correlation coefficients of each pair of independent variables in both the Income Model and Tax Models are relatively small. Therefore, the regression models do not suffer from the problem of multicollinearity.[38]

[38] This is confirmed by the variance inflation factors computed for each model.

5.3 Empirical results

5.3.1 Income Model

The results of equation (1) (i.e. Income Model) are reported in Table 8.

[Insert Table 8 here]

Given that the inclusion of manually collected variables (i.e. *ProfDiscR*, *FOP*, *ProfNCIR*, *ContTLi* and *LossCFi*) reduces the number of observations in the sample, this study firstly runs a basic model (Model 1a) excluding these variables in order to maximize the sample size. The estimated coefficient of *lProfBTax* measure the sensitivity or responsiveness of taxable income to a change in profit before tax (i.e. the elasticity of taxable income with respect to profit before tax). The coefficient of *lProfBTax* is nearly 0.5 ($p < 0.01$), indicating that when profit before tax increases by 1%, taxable income increases by 0.5%. The regression coefficients of the FOAC indicator, capital intensity and R&D intensity are not statistically significant. A positive and significant regression coefficient of *lTotAss* (as a proxy for firm size) indicates that the larger the firm, the more taxable income it has.

Next, this study runs the full Income Model base on equation (1) (Model 1b). After including all manually collected variables, the estimated coefficient of *lProfBTax* increases to 0.66 ($p < 0.01$), suggesting that the elasticity of taxable income to a 1% change in profit before tax increases to 0.66%. Sources of book-tax income differences such as discontinued operations and consolidation differences have incremental effects

on the book-tax income relation. The coefficient of *ProfDiscR*, 0.016 ($p < 0.01$), indicates that when the ratio of profit after tax from discontinued operations to total profit after tax increases by one percentage point, taxable income increases by 0.016% because *lTaxInc* is related to both continuing and discontinued operations. *ProfNCIR* has an estimated coefficient of -0.875 ($p < 0.01$). When the ratio of profit after tax attributable to non-controlling interests to total profit after tax increases by one percentage point, taxable income reduces by 0.875% as subsidiaries with non-controlling interests (i.e. not wholly owned) are not consolidated for tax purposes, hence their profits are not included in taxable income. *FOP* has a significant negative relation to *lTaxInc* with a coefficient of -0.597 ($p < 0.05$). This suggests that when foreign operations increase by one percentage point, taxable income reduces by nearly 0.6% because the profits of foreign branches and subsidiaries are exempt income and not included in taxable income. Consistent with hypothesis 2e, taxable income is smaller for firms that have losses carried forward (*LossCFi* = 1). As expected, *CapInt* is negatively associated with *lTaxInc*, and *LTotAss* is positively related to *lTaxInc*. Insignificant coefficients of *FOAC* indicates no differences in the constant term between FOACs and PCs. The coefficients for *ContTLi* and *R_DExpR* are not statistically significant in both models perhaps because the variations of these two variables across observations are so little that significant associations with *lTaxInc* cannot be detected.[39] In the case of *ContTLi*, another explanation for the insignificant

[39] Only 251 out of 2,173 firm-year observations have non-zero *R_DExpR*, so its variation across observations is very little. Similarly, only 14 out of 1,179 firm-year observations report presence of a contingent tax liability (*ContTLi* = 1), so the variation of *ContTLi* is also very little.

coefficient is that the contingent tax liability is related to tax disputes about prior years, rather than aggressive tax position taken for the current year, so that current year taxable income is not affected.

5.3.2 Tax Models

The results of two Tax Models (i.e. equations (2) and (3)) are reported in Table 9.

[Insert Table 9 here]

For the same reason presented in the Income Model section, this study firstly runs a basic model (Model 2a) using tax expense as the main independent variable.[40] The regression coefficient of *lTaxExp* is nearly 0.53 ($p < 0.01$), indicating that when tax expense increases by 1%, tax payable increases by 0.53%. The estimated coefficient of FOAC is 0.278 ($p < 0.01$). This positive sign indicates that on average FOACs have a higher constant term than PCs do.[41] *lTotAss* also has a positive and significant association with *lTaxPay*.

Next, this study runs a full model (Model 2b) using tax expense as the main independent variable. With additional explanatory variables included in the full model, the sensitivity of tax payable to a 1% change in tax expense increases to 0.71%. Sources of book-tax differences also have incremental impacts on this relation. For example, when

[40] Given that 'current tax expense' is manually collected, it is not necessary to run a basic model as in the case of 'tax expense'.

[41] Based on the empirical results for Model 2a reported in Table 7, on average FOACs (*FOAC* = 1) have a constant term that is 0.278 higher than that of PCs (*FOAC* = 0) which is 1.788. FOACs are Australian subsidiaries of foreign-based multinationals, so they are less likely to have foreign branches and foreign subsidiaries, and so their tax payable is more responsive to change in their tax expense.

the ratio of profit after tax from discontinued operations to total profit after tax (*ProfDiscR*) increases by one percentage point, tax payable increases by 0.026%. *FOP* has a significant negative relation to *lTaxPay* with a coefficient of -0.894 ($p < 0.01$). This suggests that when foreign operations increase by one percentage point, tax payable reduces by nearly 0.9% because of the foreign profit exemption and foreign income tax offsets. Consistent with hypothesis 4e, tax payable is smaller, if a firm has tax losses carried forward (*LossCFi* = 1). Similar to the result from Model 2a, *FOAC* is positively related to *lTaxPay* with an estimated coefficient of 0.199 ($p < 0.05$). *ContTLi* and *R_DExpR* are not statistically significant in Model 2b for the same reason explained before for Model 2a.

This study also estimates the Tax Model using current tax expense as the main independent variable (Model 3). The explanatory power of Model 3 ($R^2 = 0.794$) is higher than the explanatory power of Model 2b ($R^2 = 0.688$), suggesting that current tax expense can better explain the variation in tax payable than tax expense.

The estimated coefficient of *lCTaxExp* is more than 0.95 ($p < 0.01$), indicating that when current tax expense increases by 1%, tax payable increases by 0.95%. This high elasticity of tax payable with respect to current tax expense supports the argument that current tax expense in the financial report is the closest proxy for tax payable in the tax return. The estimated coefficient of *lTaxExp* in Model 2b (0.713) is smaller than the regression coefficient of *lCTaxExp* (0.954) because tax expense includes deferred tax expense, which is not related to the tax liability of the current period. The coefficient

of *ProfDiscR*, 0.017 ($p < 0.01$), suggests that one percentage increase in the ratio of profit after tax from discontinued operations to total profit after tax results in an 0.017% increase in tax payable. Similar to *FOP* in Model 2b, when foreign operations (*FOP*) increase by one percentage point in Model 3, tax payable reduces by 0.95% due to the foreign profit exemption and foreign income tax offsets. The rest of variables in Model 3 do not have significant association with *lTaxPay*.

6. Conclusion

The release of CTTRs of entity tax information by the ATO provides an opportunity to investigate the book-tax relations of large and profitable Australian companies and the sources of book-tax difference. The empirical results of this indicate that the elasticity of taxable income with respect to profit before tax is 0.66%. On average, a 1% increase in tax expense in income statement is associated with 0.71% increase in tax payable in tax return, and a 1% increase in current tax expense is associated with 0.95% increase in tax payable in tax return. Profits from discontinued operations, profits attributable to non-controlling interests in the corporate group, the extent of foreign operations and the tax losses carried forward are main sources of book-tax differences.

The analyses in this study provide a tool for investors, investment analysts, corporate regulators and tax authorities to detect excessive book-tax differences which may indicate manipulation of accounting profits and/or taxable income.

This study has its limitations. First, the time period of this study is relatively short: only three income years from 2013-14 to 2015-16. Second, the observations in the sample and the data are limited by the scope of the CTTRs released by the ATO, the availability of data on the Orbis database and the accessibility of corporate financial reports. The limited access to FOACs' annual reports due to resource constraints substantially reduces the sample size because some data items, such as current tax expense, have to be manually collected from annual reports. In addition, as this study uses a sample of large Australian companies with total income of $100 million or more, including listed Australian companies and foreign-owned Australian companies only, the findings of this study may not apply to domestic-owned private companies and smaller Australian companies.

With these results and limitations of this study in mind, some future research directions are suggested. First, the study period can be extended as the ATO continues to release CTTRs annually. As the data for a longer time period become available for research in the future, more sophisticated analytical tools such as panel data analyses can be applied. Second, if resources permit, more foreign-owned Australian companies can be included in the sample. Third, current Australian accounting standards do not require reporting entities to disclose foreign income taxes separately from Australian income tax in financial reports, so a direct comparison of Australian tax expense and current tax expense with tax payable in Australian tax return is not possible. As the ATO has started

receiving confidential country-by-country reports, the ATO can include relevant data from these reports in suitable statistical models to study book-tax relations.

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Table 1
Sample Selection

Criteria	Number of Firm-year Observations
Initial sample in the CTTRs for:	
2013-14 income year	1,588
2014-15 income year	1,963
2015-26 income year	2,043
Total	5,954
Less: observations that are domestic-owned private companies	(1,145)
Less: observations whose taxable income and tax payable are missing in the CTTRs	(1,529)
Less: observations that are listed trusts, credit unions, limited partnerships, cooperative companies, and companies that are owned by local governments	(115)
Less: observations that do not have financial data on the Orbis database	(449)
Final sample	2,716
Breakdown of final sample:	
2013-14 income year	874
2014-15 income year	920
2015-16 income year	922

Table 2
Variable Definitions

Variable	Definition
Dependent variables	
lTaxInc	The nature logarithm of taxable income in tax return;
lTaxPay	The nature logarithm of tax payable in tax return;
Independent variables	
lProfBTax	The nature logarithm of profit before tax from continuing operations;
lTaxExp	The nature logarithm of tax expense;
lCTaxExp	The nature logarithm of current tax expense;
ProfDiscR	Profit/loss from discontinued operations / Total profit after tax;
ProfNCIR	Profit/loss attributed to non-controlling interest / Total profit after tax;
FOP	Foreign fixed assets / Total fixed assets (if foreign fixed assets are disclosed in the segment report); or Foreign total assets / Total assets (if only foreign total assets are disclosed instead);
FOAC	An indicator variable which takes the value of "1" if a firm is a FOAC, and "0" if the firm is a LAC;
LossCFi	An indicator variable which takes the value of "1" if a firm has tax losses carried forward disclosed in its financial report, and "0" otherwise;
ContTLi	An indicator variable which takes the value of "1" if any contingent tax liability is mentioned in the director's report, or income tax note or contingent liability note in the financial report, and "0" otherwise;
CapInt	Capital intensity, measured by Fixed assets / Total assets;
R_DExpR	Research and development expenditure / Total income;
lTotAss	Natural logarithm of total assets as a proxy for firm size;
Ind	Indicator variables which take the value of "1" for the correct industry, and "0" otherwise (18 indicators for the 18 industries other than Agriculture, Forestry and Fishing (industry group 1));
Year	Indicator variables which take the value of "1" for the correct year, and "0" otherwise (two indicators for the two years other than 2013-14).

Table 3
Descriptive Statistics for continuous variables

Variable	Number of Observations	Mean	Std.Dev	Minimum	Maximum
lTaxInc	2,716	16.853	1.800	0.000	23.345
lTaxPay	2,408	15.566	1.716	5.505	22.097
lProfBTax	2,374	16.979	1.799	6.852	23.885
lTaxExp	2,342	15.697	1.834	5.649	22.731
lCTaxExp	997	16.321	1.693	7.601	22.668
ProfDiscR	1,249	0.056	1.528	-6.447	52.918
ProfNCIR	1,250	0.015	0.142	-2.397	1.279
FOP	1,243	0.059	0.176	0.000	0.994
CapInt	2,713	0.456	0.304	0.000	1.000
R_DExpR	2,713	0.003	0.021	-0.028	0.511
lTotAss	2,713	19.658	1.608	12.376	25.812

This table reports descriptive statistics of all continuous variables in the Income Model and Tax Models (i.e. equations (1) to (3)).
All descriptive statistics are rounded to three decimal places.
The number of firm-year observations for manually-collected variables *lCTaxExp*, *ProfDiscR*, *ProfNCIR* and *FOP* is smaller than the number of observations in the full sample due to data constraint: only the annual reports of 200 FOACs are purchased from ASIC due to resource constraints. The number of firm-year observations for *lCTaxExp* is even smaller because some FOACs claim that their financial reports are special purpose financial reports so they don't need to follow the disclosure requirements in Australian accounting standards to disclose current tax expense.

Table 4

Descriptive Statistics for Indicator Variables

Indicator Variable = 1	No. of Observations	% of Sample
FOAC	1,888	69.5
ContTLi	14	1.2
LossCFi	433	38.9

This table reports descriptive statistics of all indicator variables in the Income Model and Tax Models (i.e. equations (1) to (3)).

Table 5
Distribution of PCs and FOACs by Year

	Year			
FOAC	2014	2015	2016	**Total**
0 (PCs)	268	282	278	828
1 (FOACs)	606	638	644	1,888
Total	874	920	922	2,716

This table tabulates the distribution of indicator variable *FOAC* by year. *FOAC* takes value of "1" if a firm is a FOAC and "0" if a firm is a PC.

Table 6

Distribution of FOACs and PCs by Industry

Industry Group (Title)	PCs	FOACs	Total
1 (Agriculture, Forestry and Fishing)	7	14	21
2 (Mining)	59	115	174
3 (Manufacturing)	188	398	586
4 (Electricity, Gas, Water and Waste Service)	10	23	33
5 (Construction)	20	61	81
6 (Wholesale Trade)	29	437	466
7 (Retail Trade)	79	109	188
8 (Accommodation and Food Services)	10	27	37
9 (Transport, Postal and Warehousing)	37	83	120
10 (Information Media and Telecommunications)	60	64	124
11 (Financial and Insurance Services)	110	209	319
12 (Rental, Hiring and Real Estate Services)	18	49	67
13 (Professional, Scientific and Technical Services)	86	178	264
14 (Administrative and Support Services)	42	49	91
15 (Public Administration and Safety)	0	15	15
16 (Education and Training)	5	2	7
17 (Health Care and Social Assistance)	33	30	63
18 (Arts and Recreation Services)	18	7	25
19 (Other Services)	17	18	35
Total	828	1,888	2,716

Table 7
Correlation Matrix
(Pearson Correlation)

	lTaxInc	*lTaxPay*	*lProfBTax*	*lTaxExp*	*lCTaxExp*	*ProfDiscR*	*ProfNCIR*	*FOP*	*CapInt*	*R_DExpR*	*LTotAss*
lTaxInc	1.000										
lTaxPay	0.946*	1.000									
lProfBTax	0.687*	0.739*	1.000								
lTaxExp	0.692*	0.733*	0.922*	1.000							
lCTaxExp	0.849*	0.878*	0.844*	0.884*	1.000						
ProfDiscR	0.035	0.040	0.033	0.019	0.033	1.000					
ProfNCIR	-0.036	-0.058	0.015	0.019	0.049	-0.008	1.000				
FOP	0.166*	0.142*	0.283*	0.293*	0.285*	0.045	-0.034	1.000			
CapInt	0.212*	0.230*	0.304*	0.273*	0.301*	0.014	0.045	0.159*	1.000		
R_DExpR	0.061*	0.034	0.103*	0.104*	0.146*	-0.007	-0.014	0.353*	-0.012	1.000	
lTotAss	0.594*	0.635*	0.765*	0.763*	0.755*	0.043	0.051	0.292*	0.378*	0.056*	1.000

This table reports the correlation matrix for all continuous variables in equations (1) to (3).
* represents significance level at 0.05 levels.

Table 8
Pooled OLS Regression Results – Income Model
(*t*-statistics in brackets)

	Model 1a	**Model 1b**
lProfBTax	0.498** (10.03)	0.660** (9.30)
ProfDiscR		0.016** (2.85)
ProfNCIR		-0.875** (-3.16)
FOP		-0.597* (-2.05)
FOAC	0.062 (0.77)	-1.147 (-1.10)
LossCFi		-0.415** (-3.88)
ContTLi		0.457 (1.59)
CapInt	0.048 (0.32)	-0.434* (-2.01)
R_DExpR	-0.232 (-0.12)	0.467 (0.19)
lTotAss	0.248** (5.28)	0.218** (2.89)
Constant	2.339** (2.72)	-0.884 (-0.56)
Industry control	Included	Included
Year control	Included	Included
Observations	2,373	975
R^2	0.508	0.573
Clustered Standard Error	1.240	1.184

Refer to Table 2 for definitions of variables.
*, ** represent significance levels at 0.05 and 0.01 levels, respectively.
Clustered Standard Error is applied to adjust for heteroscedasticity.

Table 9
Pooled OLS Regression Results – Tax Models
(*t*-statistics in brackets)

	Model 2a	**Model 2b**	**Model 3**
lTaxExp	0.528** (9.69)	0.713** (11.79)	
lCTaxExp			0.954** (19.44)
ProfDiscR		0.026** (3.61)	0.017** (3.99)
ProfNCIR		-0.551 (-1.66)	-0.336 (-0.98)
FOP		-0.894** (-3.21)	-0.953** (-3.96)
FOAC	0.278** (3.70)	0.199* (2.43)	0.117 (1.79)
LossCFi		-0.168* (-1.97)	-0.056 (-0.82)
ContTLi		-0.038 (-0.09)	-0.132 (-0.37)
CapInt	0.254 (1.70)	-0.233 (-1.36)	-0.229 (-1.47)
R_DExpR	0.496 (0.26)	2.643 (1.13)	0.535 (0.23)
lTotAss	0.223** (4.41)	0.197** (3.46)	0.020 (0.34)
Constant	1.788* (2.42)	-0.952 (-1.08)	0.055 (0.09)
Industry control	Included	Included	Included
Year control	Included	Included	Included
Observations	2,146	897	884
R^2	0.576	0.688	0.794
Clustered Standard Error	1.092	0.912	0.769

Refer to Table 2 for definitions of variables.
*, ** represent significance levels at 0.05 and 0.01 levels, respectively.
Clustered Standard Error is applied to adjust for heteroscedasticity.