The Impact of Foreign Operations and Foreign Ownership on Corporate Tax Avoidance in the Australian Dividend Imputation System

Xuerui Li

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Declaration of Originality

This thesis is an original written work incorporating an account of research completed in the Doctor of Philosophy (Commerce) program. It has not been submitted for any other degree or purposes. To my best knowledge, the thesis contains no material previously published or written by another person except where due reference is made in the text of the thesis.

Xuerui Li

Research School of Accounting

The Australian National University

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Abstract

This thesis investigates the impact of foreign operations and foreign ownership on corporate tax avoidance of listed Australian companies and large Australian companies owned by foreign multinational enterprises (MNEs) in the Australian dividend imputation system.

With dividend imputation, listed Australian companies can 'pass' their corporate income tax to shareholders as a tax credit (franking credit) to offset shareholders' personal tax liabilities. Therefore, listed Australian companies may not have strong incentives to engage in costly tax avoidance arrangements. However, only domestic income tax payments can be attached to dividends as franking credits, and only domestic shareholders can claim the franking credits received as tax offset. Thus, the corporate tax avoidance-reducing effect of dividend imputation may be undermined by foreign operations (which are subject to foreign taxes) and foreign ownership.

Three empirical studies are carried out to investigate the corporate tax avoidance-reducing effect of the dividend imputation system in a comprehensive manner. The first study provides an overview of the impact of franked dividend distributions, foreign operations, and foreign ownership on corporate tax avoidance of listed Australian companies. It is found that companies distributing more franked dividends or having a lower proportion of foreign ownership engage in less corporate tax avoidance. No significant relationship between foreign operations and corporate tax avoidance is found, possibly due to listed Australian companies shifting foreign profits to Australia (inward profit shifting) in order to pay Australian income tax to frank their dividends.

The second study focuses on the relationship between foreign operations and corporate tax avoidance. It examines if listed Australian companies with mainly domestic ownership but with foreign subsidiaries take advantage of the tax rate differentials across countries to reduce their worldwide tax liabilities. The results show that companies with subsidiaries in low-tax countries, or high-tax countries, or both, have similar worldwide tax liabilities compared to their counterparts without such subsidiaries. The findings provide further indirect evidence to support the 'inward profit shifting' conjecture.

The third study focuses on the relationship between foreign ownership and corporate tax avoidance. It examines whether large foreign-owned Australian companies (FOACs)

which are subsidiaries of foreign MNEs engage in intra-group transfer pricing and thin capitalisation to avoid Australian tax in comparison with domestic-owned listed Australian companies (DOLACs) which have little incentives to do so. The results show that FOACs use intra-group transfer pricing and pay high interest rates on intra-group debts to shift profits out of Australia to reduce their Australian tax liabilities, which are manifested in their lower gross profit margins and operating profit margins, higher interest expenses but not higher leverage ratios, as well as lower pre-tax profits and income tax expenses in comparison with DOLACs.

The thesis contributes to the literature by documenting how foreign operations and foreign ownership shapes the tax avoidance behaviours of large companies in the Australian dividend imputation system. It also has significant policy implications for countries and organisations considering integrating corporate and shareholder taxes and formulating rules and regulations to tackle corporate tax avoidance.

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List of Abbreviations

AASB	Australian Accounting Standards Board
ALP	Arm's Length Principle
ASIC	Australian Securities and Investments Commission
ASX	Australian Securities Exchange
BEPS	Base Erosion and Profit Shifting
BTD	Book-tax Difference
CPLM	Cost Plus Method
CUP	Comparable Uncontrolled Price
DOLAC	Domestic-owned Listed Australian Company
DRP	Dividend Reinvestment Plan
EBIT	Earnings before Interest and Tax
EBITDA	Earnings before Interest, Tax, Depreciation and Amortisation
ETR	Effective Tax Rate
EU	European Union
FITC	Foreign Investor Tax Credit
FOAC	Foreign-owned Australian Company
G20	Group of Twenty
GICS	Global Industry Classification Standard
MNE	Multinational Enterprise
NZX	New Zealand Exchange
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
PAYG	Pay As You Go
R&D	Research and Development
RPM	Resale Price Method
STR	Statutory Corporate Tax Rate
U.S.	United States
U.K.	United Kingdom

Chapter 1: Introduction

This thesis investigates the influence of foreign operations and foreign ownership on the corporate tax avoidance of listed companies in the Australian dividend imputation system. It consists of three interrelated studies. The first study examines the corporate tax avoidance-reducing effect of the dividend imputation system on listed Australian companies. It simultaneously considers franked dividend distributions, foreign ownership and foreign operations. The second study focuses on the relationship between foreign operations and tax avoidance by listed Australian companies that have foreign operations, yet no foreign ownership, among the top 20 shareholders. The third study centres on the influence of foreign ownership on tax avoidance by comparing large foreign-owned Australian companies with domestic-owned listed Australian companies.

1.1 Motivation of the Study

This thesis is motivated by two factors: (1) the widely recognised prevalence of corporate tax avoidance in the world, especially in the United States (U.S.) which adopts a classical corporate tax system (hereafter the 'classical system'), and (2) some preliminary empirical evidence on the role of the dividend imputation system in mitigating corporate tax avoidance.

Corporate tax avoidance is pervasive—especially cross-border tax avoidance, in the wake of increased globalisation and technology advancement. In the U.S., although there is no official estimate of the tax revenue loss caused by cross-border corporate tax avoidance, a number of researchers have indirectly gauged the magnitude of the cost. Christian and Schultz (2005) report an estimation of US$87 billion of corporate profits being shifted out of the U.S. in 2001, which, if translated into tax revenue loss, would amount to approximately US$30 billion. Sullivan (2008) estimates that, in 2004, profits of approximately US$75 billion were artificially shifted out of the U.S., which could have resulted in US$26 billion tax revenue if the profits had been subject to U.S. tax. For the same year, Clausing (2009) estimates a revenue loss of more than US$60 billion, based on an estimated profit of US$180 billion being shifted from the U.S. to foreign countries. For 2007, Sullivan (2010) conservatively estimates a tax revenue loss of US$28 billion. For 2008, Clausing (2011) reports approximately US$90 billion (or US$57 billion with an alternative dataset) tax loss, which would constitute 30% (19%) of the corporate tax revenue in the year.

In Europe, corporate tax avoidance is estimated to cause annual revenue loss of €160 to €190 billion for European Union (EU) countries (European Parliament 2016). For example, the revealment of Starbucks's nil tax payment in the United Kingdom (U.K.) since 2009 resulted in public outcry. The company subsequently announced a voluntary payment of £10 million corporate taxes in 2013, and another £10 million in 2014 (BBC 2013).

In Australia, McClure, Lanis and Govendir (2016) demonstrate that 76 multinational enterprises reduced their tax liabilities in Australia by AUD$5.37 billion over 2013 and 2014, and paid an effective tax rate of 16.2%—a rate slightly higher than one half of the statutory corporate tax rate (STR) of 30% in Australia. Individually, Apple paid Australian tax of AUD$80.4 million on its revenue of AUD$5.86 billion for the year 2014, while Ikea paid AUD$31 million on its profit of more than AUD$1 billion over an 11-year period (Richardson 2015).

Given its significance in numbers, corporate tax avoidance has caused heated debate among policy makers and company lobbyists for decades. For example, the Organisation for Economic Co-operation and Development (OECD) has called for a global action plan to address the base erosion and profit shifting (BEPS) problem. In its proposal, the OECD (2013) stressed a number of actions needed, such as strengthening the existing controlled foreign corporations rules and preventing artificial avoidance of permanent establishment status. The Group of Twenty (G20) has also targeted modernisation of the international tax system. In the communiqué of the 2014 Brisbane G20 Leaders' Summit, the member countries agreed on: 'taking actions to ensure the fairness of the international tax system and to secure countries' revenue bases' (Group of Twenty 2014, p. 2).

It may be noticed that most of the notorious corporate tax avoidance scandals mentioned above involve U.S.-based companies. A number of U.S. studies have found that U.S. publicly traded companies engage in tax avoidance activities (e.g. Dyreng, Hanlon & Maydew 2008; Frank, Lynch & Rego 2009), and have observed an increasing trend of tax avoidance (e.g. Desai 2003; Manzon & Plesko 2002; Mills, Newberry & Trautman 2002). Arguably, the main reason for the extensive corporate tax avoidance by U.S. companies is the classical system that the country adopts. The classical system treats companies as separate legal entities from their owners, and taxes them separately. In such a system, companies pay income tax on their profits at the corporate tax rate. When the after-tax profits are distributed as dividends, shareholders pay tax on their dividend

income at their personal income tax rates. As a result of the double taxation on corporate profits distributed as dividends, corporate managers and shareholders in the classical system view corporate income tax as a cost to be minimised to maximise shareholders' after-tax wealth. Therefore, they have strong incentives to engage in corporate tax avoidance.

In contrast to the classical system, the dividend imputation system may not encourage corporate tax avoidance by listed companies.[1] Generally, the imputation system integrates corporate income tax with shareholders' personal income tax, thereby eliminating the double taxation on corporate profits distributed as dividends. This is achieved by allowing companies to attach domestic corporate income tax as tax credits (franking credits) to dividends, and allowing resident shareholders to claim an offset for the franking credits against their personal income tax. As such, in a full dividend imputation system, such as the one in Australia, if corporate income tax is 'passed' to shareholders as franking credits, it is only a pre-payment of shareholders' personal tax, and not a real cost to the company. Therefore, depending on the extent to which corporate income tax can be claimed by shareholders, corporate managers and shareholders may not have strong incentives to engage in corporate tax avoidance. Recent studies by Amiram, Baur and Frank (2013); Ikin and Tran (2013); and Wilkinson, Cahan and Jones (2001) provide preliminary empirical evidence on the corporate tax avoidance-reducing effect of the dividend imputation system for listed companies. Therefore, it is unsurprising that, when submitting to the Senate Economics Reference Committee, the Australian Taxation Office (2015a, p. 34) stated that:

> A suite of indicators generally suggests companies are paying the income tax required under Australia's tax laws. Tax risk appetite has declined over the past decade.
>
> Company income tax receipts continue to move in line with macro-economic indicators, reflecting broad compliance by corporates with their income tax obligations.

Currently, Australia, New Zealand, Canada, Chile, Mexico and Malta are the countries adopting a full dividend imputation system.[2] European countries that had adopted a full or partial imputation system in the past—including the U.K., Ireland, Germany, Italy,

[1] Before 1987, Australia operated the classical system. The dividend imputation system was originally introduced to encourage the use of companies as an organisation form to run business on a large scale. This is because, in the classical system, the double taxation of corporate profits places companies in an unfavourable tax position, compared with sole proprietorships, partnerships and trusts, whose profits are taxed only once.

[2] Canada gives tax credit for corporate income tax paid, regardless of the countries where the tax is paid.

Finland, France and Norway—abolished their imputation systems between 1999 and 2006 because the European Court of Justice found that dividend imputation discriminated against foreign income taxes paid and foreign investors between the member countries within the EU (Harris 2010).

The research objective of this thesis is to provide a comprehensive examination of the corporate tax avoidance-reducing effect of the dividend imputation system on Australian listed companies,[3] with a special focus on the potentially countervailing influence from foreign operations and foreign ownership. The findings from the thesis will contribute not only to the literature on corporate tax avoidance and the dividend imputation system, but also to the continuing debate among policy makers on how corporate tax avoidance can be tackled.

1.2 Research Questions

This thesis investigates the corporate tax avoidance-reducing effect of the Australian dividend imputation system on listed companies, with a focus on examining whether foreign operations and foreign ownership would attenuate this effect.

Theoretically, for listed companies that are featured with separation of ownership and control, the Australian dividend imputation system alleviates the double taxation of Australian corporate profits distributed as dividends to resident shareholders, which makes corporate income tax only a pre-payment of shareholders' tax, and not a real cost to the companies and shareholders. Thus, Australian listed companies may not have strong incentives to engage in corporate tax avoidance which provides no tax savings and requires substantial costs. In other words, the dividend imputation system has a corporate tax avoidance-reducing effect. However, the imputation benefits may not be fully enjoyed by Australian companies with significant foreign operations or foreign ownership. This is because, with the current system, only Australian income tax paid can be passed to shareholders as franking credits, and only Australian resident shareholders can claim the tax offset upon receiving dividends with franking credits (these dividends are called 'franked dividends'). This means that companies with foreign operations or foreign ownership may still encounter double taxation on corporate profits distributed as

[3] For private companies with no separation of ownership and control, the corporate tax avoidance-reducing effect of the dividend imputation system does not apply. Private companies are not examined in this research because of lack of data.

dividends. Therefore, it is expected that the corporate tax avoidance-reducing effect of the Australian dividend imputation system may be undermined for these companies.

To fulfil the purpose of the thesis, the following three research questions are addressed:

1. Does the Australian dividend imputation system alleviate the corporate tax avoidance of Australian listed companies? If so, how does the system achieve this? Do franked dividend distributions, foreign ownership and foreign operations affect corporate tax avoidance?
2. Do Australian listed companies with foreign operations engage in cross-border profit shifting for tax avoidance? If so, what is the effect of the profit shifting on their overall tax liabilities?
3. Do large Australian companies with substantial foreign ownership engage in cross-border profit shifting—particularly intra-group transfer pricing and thin capitalisation—to reduce Australian tax?

The above three questions are answered via three interrelated empirical studies. Study 1 examines how different degrees of franked dividend distributions, foreign ownership and foreign operations affect corporate tax avoidance, based on a sample of Australian listed companies. Study 2 extends Study 1 by further exploring the relationship between foreign operations and corporate tax avoidance. It investigates how the statutory corporate tax rates of the hosting countries of foreign subsidiaries of listed Australian companies affect the companies' tax avoidance. Studies 1 and 2 look at foreign operations from different perspectives. Study 1 focuses on the extent of foreign operations hence measures it as the ratio of foreign assets to total assets. Study 2 emphasises the impact of different foreign tax rates on corporate tax avoidance. Study 3 provides complementary evidence on the relationship between foreign ownership and corporate tax avoidance found in Study 1. It examines whether foreign-owned Australian companies engage in tax-induced cross-border profit shifting - a tax avoidance practice not captured in Study 1 or Study 2. Study 3 compares Australian subsidiaries of foreign multinational enterprises (foreign-owned) with domestic-owned listed Australian companies. The later do not have strong incentives to shift profits overseas due to the imputation tax benefits to their domestic shareholders, and therefore can serve as the benchmark.

This thesis first reviews the broad literature on corporate tax avoidance and the dividend imputation system to provide background knowledge and position the thesis in the

literature. Each of the three empirical studies then reviews the most relevant literature, based on the specific hypotheses being developed.

1.3 Research Design and Major Findings

This thesis consists of three empirical studies. The data employed are sourced from commercial databases, DatAnalysis Premium and Osiris; the IBISWorld website, Bloomberg, and the Australian Securities and Investments Commission (ASIC).

1.3.1 Study 1

The first empirical study investigates the influence of franked dividend distributions, foreign ownership and foreign operations on corporate tax avoidance, based on a sample of profitable Australian listed companies, across the period 2009 to 2012.

The data necessary to construct the measures of corporate tax avoidance, franked dividend distributions, foreign operations, foreign ownership and firm size are manually extracted from annual reports obtained from DatAnalysis Premium. Corporate tax avoidance is measured by the ratio of adjusted current income tax expense to pre-tax accounting profit before the share of associates' profit or loss. Adjusted current income tax is the current income tax, excluding the adjustment for (current) income tax expense for the previous year(s), yet including the adjustment to current income tax expense that is reported in the subsequent year's annual report. Royalty-related taxation and resource rent tax reported as part of income tax expense are excluded. The franked dividend distributions measure is the total of franked interim, franked final and franked special dividends for the year, divided by after-tax accounting profit, excluding the amount attributable to non-controlling interest. Foreign ownership is measured by the ratio of the percentage of foreign shareholdings among the top 20 shareholders to the total percentage of the top 20 shareholdings. The nationality information for each of the top 20 shareholders is sourced mainly from Osiris, and from credible websites, such as Bloomberg and ASIC Connect. The extent of foreign operations is measured by the ratio of (non-current) segment assets located in countries other than Australia and New Zealand to total (non-current) segment assets. Firm size is measured by the natural logarithm of sales revenue. In addition, the four-digit industry classification codes based on the Global Industry Classification Standard (GICS) for each of the firm-year observations are obtained from DatAnalysis Premium. The year indicators are manually assigned to each firm-year observation.

The statistical method used is ordinary least squares (OLS) regression, where the corporate tax avoidance measure is regressed on the franked dividend distributions measure, foreign ownership measure and foreign operations measure, along with control variables, including firm size, industry dummy variables and year dummy variables. The OLS regression analyses show that companies distributing a higher proportion of their after-tax profits as franked dividends, and companies with less foreign ownership engage in less corporate tax avoidance. Franked dividend distributions allow companies to pass their corporate income tax to shareholders as franking credits. Australian shareholders can claim the franking credits received as tax offset, and therefore would prefer companies to distribute franked dividends. In turn, to be able to distribute franked dividends, companies need to pay Australian income tax hence would not have strong incentives to avoid tax. In contrast, foreign shareholders cannot claim the franking credits as tax offset in their home countries, and therefore would prefer companies to avoid tax to increase their after-tax returns on the investment. With regard to the effect of foreign operations on corporate tax avoidance, no significant influence is found, after controlling for franked dividend distributions and foreign ownership. The additional analysis reveals that, when an Australian company with foreign ownership pays more franked dividends to meet the demands of its Australian shareholders, it tends to engage in less corporate tax avoidance.

The findings in Study 1 provide evidence for the corporate tax avoidance-reducing effect of the Australian dividend imputation system for listed companies. The findings also provide directions for the research undertaken in the second and third studies.

1.3.2 Study 2

The second empirical study is an extension of the first study, with the aim of further exploring the insignificant relationship between foreign operations and corporate tax avoidance found in Study 1. Study 2 employs two subsidiary location indicators to replace the foreign operations measure in Study 1 to examine whether companies with subsidiaries incorporated in foreign low-tax countries (with STR not higher than 20%) or foreign high-tax countries (with STR not lower than 35%) take advantage of the tax rate differences to reduce their worldwide tax liabilities. The foreign subsidiary location indicators are created based on the places of incorporation of subsidiaries, which are disclosed in the notes to financial statements.

The sample is based on the sample in Study 1, yet narrowed to include firm-year observations with no foreign ownership among the top 20 shareholders to ensure that the results are not confounded by the relationship between foreign ownership and corporate tax avoidance. The statistical method used is OLS regression. Study 2 employs the corporate tax avoidance measure in Study 1 to proxy corporate worldwide tax liability. The Australian Accounting Standards do not require disclosure of foreign taxes separate from Australian tax, making the reported tax an aggregate figure for worldwide tax. The worldwide tax liability measure is regressed on the two foreign subsidiary location indicators (and their interaction in additional analyses), alongside control variables including the franked dividend distributions, firm size, and industry and year dummy variables.

The results indicate that, among companies without foreign ownership, those with subsidiaries incorporated in low-tax countries, high-tax countries, or both do not have significantly lower or higher worldwide tax burdens, compared with those without such subsidiaries. This means that, for companies with foreign operations, different locations of foreign subsidiaries do not trigger tax avoidance activities to reduce their worldwide tax liabilities, providing strong (although indirect) evidence that foreign profits are shifted to Australia. Such inward profit shifting enables a greater proportion of the companies' worldwide profits to be taxed in Australia, which facilitates the constant distributions of franked dividends, thereby providing a great level of tax benefits to shareholders in the Australian dividend imputation system.

1.3.3 Study 3

The third empirical study provides complementary evidence on the relationship between foreign ownership and corporate tax avoidance found in Study 1. It examines whether large foreign-owned Australian companies (FOACs) engage in intra-group transfer pricing and thin capitalisation to shift profits out of Australia to reduce their Australian tax liabilities, compared with domestic-owned listed Australian companies (DOLACs), which are used as the control group.

FOACs are identified by screening the list of the top 2,000 Australian companies in 2012, which is obtained from IBISWorld, and by checking the description of each of the 2,000 companies provided by the IBISWorld website. DOLACs are selected from the top 500 Australian listed companies, excluding those with more than 20% foreign ownership, among the top 20 shareholders.

The comparison between FOACs and DOLACs is undertaken by performing paired sample *t*-tests using the propensity score matching technique, as well as OLS regression analyses based on the matched sample. The propensity score estimation is based on firm size and industry affiliation for all paired samples construction, as well as capital intensity for the paired samples to enable thin capitalisation examination. The firm size measure and industry dummy variables follow those in the previous two studies. Capital intensity is measured by the ratio of non-current assets to total assets.

In the absence of intra-group transaction data, intra-group transfer pricing and thin capitalisation are measured using financial data from annual reports. Specifically, the extent of engaging in intra-group transfer pricing is measured by the ratio of gross profit to sales revenue, and the ratio of earnings before interest and tax (EBIT) to sales revenue between FOACs (treatment group) and DOLACs (control group), while the extent of using thin capitalisation is measured by the ratio of interest expense to sales revenue, and leverage between the two groups. Moreover, the effectiveness of using intra-group transfer pricing and thin capitalisation to shift profits out of Australia to avoid Australian tax is measured by the ratio of pre-tax profit to sales revenue, and the ratio of income tax expense to sales revenue between the two groups.

The required data items are mainly hand-collected from annual reports, which are obtained from DatAnalysis Premium for DOLACs and purchased from the ASIC for FOACs. The industry classification (four-digit GICS codes) is obtained from DatAnalysis Premium for DOLACs, and manually coded for FOACs, based on the principal activity information disclosed in annual reports.

The results from the paired sample *t*-tests using propensity score matching indicate that FOACs use both intra-group transfer pricing and pay higher interest rates on debts to shift profits out of Australia to avoid Australian tax, as they have lower gross profit to sales revenue ratios, and lower EBIT to sales revenue ratios; higher interest expense to sales revenue ratios, yet similar leverage levels; lower pre-tax profit to sales revenue ratios, and lower income tax expense to sales revenue ratios than do comparable DOLACs. The differences in the intra-group transfer pricing measures between FOACs and DOLACs are larger in absolute values than those in the thin capitalisation measures, suggesting that intra-group transfer pricing has a stronger effect than thin capitalisation, thereby constituting the primary tax avoidance channel by FOACs. The regression analyses based on the paired samples triangulate the findings.

1.3.4 Summary

The results from the three studies together suggest that the Australian dividend imputation system has a corporate tax avoidance-reducing effect for listed companies in general. This effect is stronger for companies distributing more franked dividends and with less foreign ownership. Further, companies with foreign operations, yet without foreign ownership, are likely to shift foreign profits back to Australia to allow their shareholders to enjoy greater tax benefits from the dividend imputation system. In contrast, companies with substantial foreign ownership have strong incentives to engage in corporate tax avoidance, mainly via intra-group transfer pricing, and, to a less extent, through paying high interest rates on debts, to maximise their shareholders' after-tax returns.

The remainder of this thesis is organised as follows. Chapter 2 reviews the literature on corporate tax avoidance, mainly from the perspective of the accounting discipline. Chapter 3 introduces the Australian dividend imputation system and provides a review of the literature on the system. Chapters 4, 5 and 6 present the three empirical studies. Finally, Chapter 7 summarises the findings of the three studies and provides the policy implications for dividend taxation and corporate tax avoidance at both the national and international levels.

Chapter 2: Corporate Tax Avoidance

2.1 Introduction

The body of corporate tax avoidance literature is vast and the topic has been extensively studied by academics in the disciplines of accounting, finance, economics and law. It should be noted that this thesis considers only explicit tax, yet not implicit tax, as explicit tax represents transfer of resources from the corporate sector to the tax authority, and is directly observable from the financial numbers in companies' annual reports or statistics published by the tax authority. Conceptually different from explicit tax, implicit tax is not paid to the tax authority, but is reflected in the reduction in the pre-tax rate of return of tax-advantaged investments or activities because of increased prices for undertaking the investments (including input costs), driven by competition (Scholes & Wolfson 1992).

Prior studies have used different terminologies to describe activities or arrangements for seeking reductions in corporate tax liabilities, including, but not limited to, 'tax avoidance', 'tax aggressiveness', 'tax sheltering' and 'tax evasion'. The main differences in the terminologies lie in the legality and aggressiveness of the tax-reducing activities. Slemrod and Yitzhaki (2002) characterise tax avoidance as legal, yet tax evasion as illegal. Hanlon and Heitzman (2010, p. 137) view tax avoidance broadly as a continuum where 'something like municipal bond investments are at one end (lower explicit tax, perfectly legal)', and 'terms such as "noncompliance", "evasion", "aggressiveness", and "sheltering" would be closer to the other end of the continuum'. Some studies examine tax sheltering activities in particular. Bankman (1998, p. 1775) describes a corporate tax shelter as a tax-motivated transaction that literally interprets laws and regulations without being consistent with the original intention of the laws, and is subsequently 'apt to be subject to legal challenges if discovered on audit'.

This thesis focuses on corporate tax avoidance and follows Guenther, Matsunaga and Williams (2013, p. 2) to define corporate tax avoidance as 'adopting tax policies that reduce the firm's income tax payments'.[4] This chapter reviews the literature on corporate tax avoidance mainly from the perspective of the accounting discipline. Section 2.2

[4] Guenther, Matsunaga and Williams (2013) distinguish tax avoidance from other concepts, such as tax aggressiveness and tax risk. Tax aggressiveness is defined as 'the extent to which the firm takes tax positions that are unlikely to survive a challenge' (p. 3) by the relevant government/tax authorities, while tax risk is defined as 'uncertainty regarding the firm's future tax payments' (p. 4).

introduces the theories for corporate taxation and the various ways to integrate corporate and shareholder taxes. Section 2.3 examines the incentives for corporate tax avoidance. Section 2.4 explains a number of prevailing tax avoidance mechanisms adopted by publicly listed companies.[5] Section 2.5 presents various corporate tax avoidance measures that are widely employed in prior studies, as well as the firm-level characteristics that are suggested to relate to corporate tax avoidance. Finally, Section 2.6 summarises the chapter.

2.2 Theories for Corporate Taxation and Integration of Corporate and Shareholder Taxes

To understand corporate tax avoidance, it is necessary to return to the most fundamental question: why corporate income tax? Arguably, a corporation (or a company) is a separate legal entity, yet not a natural person on whom the economic burden of tax must ultimately fall (Musgrave & Musgrave 1989). Nonetheless, corporate taxation has existed for more than a century and several arguments have been used to justify its existence, as presented below.

After surveying extant attempts to defend the existence of corporate tax, Avi-Yonah (2004) divides the defences into three categories: aggregate, artificial entity and real entity. Specifically, the aggregate theory views corporate tax as an indirect tax on shareholders. The underlying argument is that, without corporate tax, individual shareholders can easily defer or exempt their income tax through earning income from corporations. Moreover, there is administrative advantage provided by corporate tax as an indirect tax on shareholders because there are fewer corporations than shareholders.

In the artificial entity theory, corporations are viewed as artificial entities created by the government that need to pay tax for the benefits provided by the government. Such benefits include the great level of liquidity proffered by access to the share market, as well as the infrastructure and education provided by the host country (benefits for foreign companies in particular), which facilitate economic rent creations.

The real entity theory focuses on publicly listed companies and views them as real entities separate from their shareholders and the government, yet under the control of the

[5] Tax avoidance mechanisms particularly potent to private companies are beyond the scope of this thesis and are subsequently not reviewed.

corporate managers. The managers have the right to allocate corporate resources for profit generation; thus, they can be viewed as the real corporation that should be taxed. Further, agency problems resulting from the separation of ownership and control for publicly listed companies have recently emerged as another justification for corporate tax. Without corporate tax, the manager-shareholders who usually have high income would be taxed at a high individual tax rate upon selling an appreciated corporate asset, while some other shareholders (such as pension funds and universities) would not. Consequently, the additional tax burden imposed on manager-shareholders may deter actions that are in the best interest of all shareholders.

Avi-Yonah (2004) points out that none of the three theories is convincing or persuasive.[6] However, from the normative argument perspective, he proposes that the 'regulatory rationale'—which is the original argument for adopting corporate taxation in 1909—can still be valid now. Specifically, Avi-Yonah (2004) notes that corporate tax has two regulatory functions: directly imposing a limit on the rate of corporate wealth accumulation, and providing incentives or disincentives to particular corporate activities (such as tax concessions provided to encourage investment in research and development [R&D] activities—R&D tax concession).

Mirrlees et al. (2011) also support a separate taxation on corporate profits. In line with the aggregate theory, they argue that taxing shareholders directly on their share of the corporate profits is administratively cumbersome, considering the large number of shareholders that a listed company typically has, the existence of foreign shareholders, the shareholdings by financial intermediaries, and the possibility that corporate profits are retained to finance operations. Further, the absence of corporate income tax may present an opportunity for individual taxpayers to avoid their personal income tax by earning income through companies.

Thus, although corporate income tax may result in double taxation on corporate profits (at the company and shareholder levels), abolishing the tax does not constitute a feasible

[6] In the U.S., other academics propose eliminating the separate corporate income tax by taxing shareholders directly in various forms. For example, Dodge (1995) prescribes a two-tier integration of corporate and shareholder taxes, including eliminating corporate income tax, taxing holders of publicly traded stocks on unrealised appreciation, and taxing holders of non–publicly traded stocks on corporate profits and losses on a pass-through basis. Halperin (1999) argues for eliminating the separate corporate tax on public companies, indexation for inflation, and the allowance of all losses. Polito (1989) proposes an integration program to abolish corporate income tax, and allocate corporate income to shareholders and tax as income to shareholders. However, as discussed previously, corporate income tax should still exist for administrative convenience and to support the implementation of personal income tax.

solution. Instead, integrating corporate and shareholder taxes for the distributed corporate profits appears to be a practical and promising approach to manage the double taxation issue. Various integration approaches have been adopted by different countries. These approaches can be broadly classified as either corporate relief systems or shareholder relief systems, depending on the level at which the issue is relieved. Corporate relief systems relieve the double taxation on distributed corporate profits at the corporate level, by allowing tax deductions for dividend payments (dividend deduction approach); taxing dividends at a rate lower than retained earnings (split rate approach); imposing no corporate tax on distributed profits (but usually coupled with withholding tax on dividends); or imposing income tax on distributed profits, yet not on retained earnings (dividend income is not taxed in the hands of shareholders). Shareholder relief systems alleviate the double taxation problem by granting relief at the shareholder level. Such systems normally give shareholders full or partial credit for the corporate tax paid on the distributed profits (full or partial dividend imputation system), or impose no dividend income tax in the hands of shareholders (dividend exemption).

Among the various approaches, only the full dividend imputation system and dividend exemption ensure only one layer of tax on distributed profits, while maintaining corporate tax on retained earnings. The full dividend imputation system allows shareholders to claim the paid corporate income tax on the distributed profits as an offset against their personal tax liabilities, while dividend exemption means that dividends are exempt from income tax when received by shareholders. In general, corporate profits are taxed at the progressive personal income tax rates of shareholders in a dividend imputation system, yet are taxed at a usually flat corporate tax rate when dividend exemption is adopted. Currently, Australia, New Zealand, Canada, Chile, Mexico and Malta operate a full dividend imputation system. Singapore, Malaysia and Hong Kong are examples of countries or jurisdictions adopting the 'one-tier taxation system', where dividends are exempt in shareholders' hands.[7]

2.3 Corporate Tax Avoidance Incentives

Corporate tax avoidance incentives are more complex than those of individual tax avoidance, primarily because companies feature the separation of ownership and control

[7] Singapore abolished its dividend imputation system and replaced it with the 'one-tier taxation system' in 2003. However, Teck (2006) argues that removing the imputation system adversely affects investors with low marginal tax rates, as they would no longer be able to obtain a refund of the unused franking credits.

(Slemrod 2004). In the case of publicly listed companies, the large number of shareholders may contribute further complications. As a result of the separation of ownership and control, companies' incentives to avoid tax should be discussed from both the principals' perspective and the agents' perspective.

The principals are individual shareholders who, if economically rational, have incentives to maximise the return on their investment in the company. The return is usually in the form of dividends or capital gains, both of which hinge on the after-tax profit of the company. Therefore, if corporate income tax is not fully integrated with shareholder personal income tax, it constitutes a cost and needs to be minimised to maximise the after-tax return to the shareholders.

However, since shareholders do not participate in the daily operations of the business, but delegate their rights to managers, they need some mechanisms to ensure that the managers engage in tax avoidance activities for return maximisation. Such mechanisms typically include tying managers' remuneration 'explicitly or implicitly, to observable outcomes such as the average effective tax rate or after-tax corporation profitability' (Slemrod 2004, p. 885). According to Chen and Chu (2005), such remuneration should compensate managers not only for their efforts in managing tax liability downwards, but also for the risk they bear, despite the efficiency loss from the double compensation. The studies by Hanlon, Mills and Slemrod (2005); Phillips (2003); and Rego and Wilson (2012) provide evidence for the effectiveness of using compensation to drive managers to engage in corporate tax avoidance.

Thus, from the perspective of managers (agents), their first incentive to avoid corporate income tax derives from the greater remuneration that can be obtained if the tax avoidance activities create positive net savings hence increased after-tax profits. The second incentive, as proposed by Desai, Dyck and Zingales (2007), is to use complex corporate structures to not only reduce corporate tax, but also conceal the diversion of corporate resources for managers' private use. The diversion of corporate resources could be reduced by strong external tax enforcement or strong internal corporate governance.

The above discussion suggests that, for publicly listed companies, the primary tax avoidance incentive derives from shareholders' return maximisation intention. Therefore, to tackle corporate tax avoidance, reducing shareholders' incentive is crucial.

2.4 Prevailing Corporate Tax Avoidance Mechanisms

For listed companies, corporate tax avoidance can be broadly categorised into book-tax non-conforming and book-tax conforming tax avoidance (Hanlon & Heitzman 2010). As the names suggest, book-tax non-conforming tax avoidance refers to activities that result in decreases in taxable income, without corresponding reductions in pre-tax accounting profit (book income), while book-tax conforming tax avoidance refers to activities that reduce both taxable income and pre-tax accounting profit.

Book-tax non-conforming tax avoidance is mainly achieved by exploiting the differences between accounting standards and tax rules. Depending on whether the resultant book-tax difference in a particular financial reporting period will be reversed over time, the difference can be classified as either a permanent or temporary difference. Permanent differences arise when certain income or expense items are recognised either for accounting purpose or for tax purpose, but not both. Typical examples of items that lead to permanent differences include tax-exempt income (such as dividends received from non-portfolio shareholdings in foreign companies), some types of tax concessions that allow companies to claim more tax deductions than accounting expense (such as the R&D tax concession) and tax non-deductible expenses (such as entertainment expenses). Temporary differences arise when certain income or expense items can be recognised for both accounting and tax purposes, but are recognised in different periods. For instance, the tax laws allow accelerated depreciation, by which companies are able to claim greater tax deduction in the early life of the depreciating asset than accounting standards, thereby reporting lower taxable income than pre-tax accounting profit in the earlier years. However, temporary differences reverse over time. Thus, companies may have greater taxable income than pre-tax accounting profit in later years of the useful life of the asset because the depreciation allowed under the accounting standards continues, yet tax depreciation has declined or ceased. Having that said, whether and to what extent taxable income exceeds pre-tax accounting profit in the later years also depend on acquisition of new depreciating assets.

Book-tax conforming tax avoidance primarily involves reducing income (such as sales revenue) and increasing expenses (such as the cost of goods sold and interest expense) that are recognised for both accounting and tax purposes. Therefore, both pre-tax accounting profit and taxable income (and the resultant tax liability) are reduced simultaneously.

For listed companies, reporting a low level of accounting profit may lead to high non-tax costs, such as potential breach of debt covenants, lower management remunerations and negative reactions from the capital market. Cloyd, Pratt and Stock (1996) show that, compared with managers of private companies, managers of public companies are less likely to engage in book-tax conforming tax avoidance. Mills and Newberry (2001) confirm the findings of Cloyd, Pratt and Stock (1996), and suggest that non-tax financial reporting costs are generally higher for public companies than for private companies. Nevertheless, for multinational enterprises (MNEs), a particular type of book-tax conforming tax avoidance—namely, cross-border profit shifting—may be more potent than book-tax non-conforming tax avoidance. Cross-border profit shifting can result in a larger proportion of profit (taxable income) being taxed in countries with low tax rates, and a smaller proportion of profit (taxable income) being taxed in countries with high tax rates, thereby helping the MNE, as a consolidated group, to reduce its worldwide tax liability. The costs associated with reporting low accounting profit by subsidiaries in high-tax countries are not an issue because any effects (except resultant tax expense) from intra-group transactions will be eliminated upon consolidation.[8]

Two prevailing cross-border profit shifting mechanisms are intra-group transfer pricing and thin capitalisation. Intra-group transfer pricing refers to the prices charged for the flow of goods and services between members of an MNE that operate in different countries with different tax rates. Using intra-group transfer pricing, MNEs can shift profits from high-tax countries (such as Australia) to low-tax countries (such as tax havens) to take advantage of tax rate arbitrage. Thin capitalisation generally refers to heavy use of debt, rather than equity, as a source of finance. Since interest expense is tax deductible, a higher level of debt creates greater tax deduction. In this thesis, thin capitalisation is defined in the context of MNEs as having subsidiaries located in high-tax countries being heavily debt-financed, or shifting debts from subsidiaries in low-tax countries to subsidiaries in high-tax countries.

Previous studies—mainly using U.S. and European data—have documented MNEs' engagement in intra-group transfer pricing or thin capitalisation to reduce their worldwide

[8] Suppose an MNE has two subsidiaries, A and B, operating in Country A and Country B, respectively. Whether the profit is recorded by Subsidiary A or B, on consolidation, the MNE group has the same reported profit.

tax liabilities (e.g. Dischinger 2007; Grubert & Mutti 1991; Huizinga & Laeven 2008; Mills & Newberry 2004).

2.5 Corporate Tax Avoidance Measures and the Influential Factors

2.5.1 Corporate Tax Avoidance Measures

Prior studies use different proxies for corporate tax avoidance, most of which are variants of the effective tax rate (ETR), which can be broadly defined as the ratio of a measure of corporate tax liability to a measure of pre-tax economic income. Since the true corporate tax liability is not publicly available and the true corporate economic income is not observable, the financial measures of the two—primarily obtained from companies' annual reports—are employed as the proxies. The lower the ETR relative to the STR, the greater the corporate tax avoidance.

However, the most appropriate ETR measure is subject to debate among tax researchers, and depends on the specific research question examined in the particular study. Traditionally, ETR is measured as the ratio of income tax expense, current income tax expense, or cash taxes paid, to pre-tax accounting profit or operating cash flows (e.g. Gupta & Newberry 1997; Shevlin & Porter 1992; Zimmerman 1983).[9] Since the early 2000s, the book-tax difference (BTD) has gained popularity. It is often measured by pre-tax accounting profit minus estimated taxable income (income tax expense, or current income tax expense, grossed-up by STR), scaled by total assets or pre-tax accounting profit (e.g. Chen et al. 2010; Frank, Lynch & Rego 2009; Lennox, Lisowsky & Pittman 2013; Lisowsky, Robinson & Schmidt 2013). Despite the preference shifting from ETR to BTD, Hanlon and Heitzman (2010) and Guenther (2014) argue that the traditional ETR and BTD essentially capture the same type of corporate policies or activities resulting in lower taxable income than pre-tax accounting profit. Therefore, BTD could be viewed as an alternative expression of the traditional ETR, and it would be meaningless to use both measures in the same study.

In recent U.S. studies, cash ETR, especially long-run cash ETR, has been increasingly employed, following Dyreng, Hanlon and Maydew (2008). Long-run cash ETR is the sum of a firm's total cash taxes paid over a long period (such as 10 years), divided by the sum of the firm's total pre-tax accounting profits over the same period. The measure is

[9] For a synthesis of various ETR measures before and during the early 1990s, refer to Callihan (1994).

believed to be superior to the traditional ETR, as it reflects a company's long-run tax payments and the tax benefits of employee stock options, and is not influenced by estimation changes, such as valuation allowance (Dyreng, Hanlon & Maydew 2008).[10] Nevertheless, cash ETR may not be an appropriate tax liabilities or tax avoidance measure in Australia.[11] Australia operates a 'Pay As You Go' (PAYG) system; thus, the cash tax paid by a company in a financial year includes the tax paid for the current year (first three quarterly PAYG instalments) and the tax paid for the previous year (last quarterly PAYG instalment and final balance on assessment). Consequently, the amount of cash tax paid, as reported in the statement of cash flows, consists of partial tax liabilities for two years, which renders cash ETR an inappropriate measure of tax liabilities for Australian companies, unless the study period is sufficiently long that long-run cash ETR can be computed.

Despite its wide use in the literature to proxy for tax avoidance, ETR, together with all its variants, only captures book-tax non-conforming tax avoidance. Recall that ETR is the ratio of income tax expense to pre-tax accounting profit. Activities that reduce tax expense without simultaneously reducing pre-tax accounting profit result in decreased ETR. The lower the ETR, the greater the corporate tax avoidance. If the numerator of ETR is total income tax expense, the ratio captures permanent differences between pre-tax accounting profit and taxable income; if the numerator is current income tax expense, the ratio captures both permanent and temporary differences.

Unlike book-tax non-conforming tax avoidance, which can be measured aggregately by ETR, book-tax conforming tax avoidance is difficult to detect and requires different

[10] Dyreng, Hanlon and Maydew (2008) employ a study period from 1995 to 2004. In the U.S. before 2004, the accounting standard FAS 123 required no recognition of the expense related to employee stock options in calculating net accounting profit. The related tax deduction was allowed when the stock options were exercised. This difference in accounting and tax rules in treating the employee stock options–related expense resulted in permanent difference between pre-tax accounting profit and taxable income. The stock options–related tax deduction did not reduce current tax expense (the tax benefits were added directly to equity), thereby leading to overstated current income tax expense.

[11] In Australia, employee stock options–related expense became deductible for both accounting and tax purposes after the introduction of the Australian Accounting Standards Board (AASB) 2 in 2005. According to AASB 2, for employee stock options, companies need to account for the services provided by the employees during the vesting period, and recognise the corresponding increase in equity. AASB 112 requires the difference between the tax base of the employee services (as compensated by stock options) received to date and the carrying amount (which is nil for financial reporting purpose) to be recognised as deductible temporary difference, which leads to a deferred tax asset. Movement in deferred tax asset is included in income tax expense, and deferred tax asset can be used to offset tax liability in future periods when the employee stock options are actually exercised. Thus, the income tax expense or current income tax expense in the year in which the options are exercised is not overstated. It follows that, in the Australian context, cash ETR is not superior to traditional ETR in relation to the recognition/non-recognition of expenses related to employee stock options.

measures, depending on the specific tax avoidance approach investigated in the research. For intra-group transfer pricing, because of the lack of intra-group trade data, prior studies mostly rely on examining the relation between foreign subsidiaries' profitability levels and the local tax rates (e.g. Egger, Eggert & Winner 2010; Hines & Rice 1994). A negative relation is viewed as evidence for profit shifting, as it indicates that greater profit is taxed in low-tax countries. Similarly, the use of thin capitalisation for tax avoidance by MNEs is often manifested in a positive relation between local tax rates and leverage ratios (e.g. Desai, Foley & Hines 2004).

2.5.2 Firm-level Characteristics Associated with Tax Avoidance

A number of firm-level characteristics are suggested to be associated with corporate tax avoidance, as discussed below.

Firm size

Firm size is the most widely recognised firm-level characteristic related to corporate tax avoidance. However, no consensus has been achieved in the literature regarding whether firm size exerts a positive or negative effect on tax avoidance. Those proposing a positive firm size effect argue that, compared with small companies, large companies have greater incentives and ability to engage in corporate tax avoidance activities that are costly to plan and establish. Siegfried (1972) shows that larger companies have greater power to influence political process for their interest and undertake tax planning to achieve optimal tax savings than do their smaller counterparts. Mills, Erickson and Maydew (1998) find that tax planning costs decrease as firm size increases, suggesting the existence of economies of scale in tax planning. Studies proposing a negative firm size effect on corporate tax avoidance argue that large companies are subject to greater scrutiny and regulatory actions, and subsequently incur higher political costs, such as taxes, than do small companies (e.g. Omer, Molloy & Ziebart 1993; Watts & Zimmerman 1978; Zimmerman 1983).

The empirical results in the literature are also mixed. While a number of studies document a negative (positive) relation between firm size and ETR (corporate tax avoidance) (e.g. Harris & Feeny 2003; Tran & Yu 2008; Tran 1997), some report a positive relation (e.g. Davidson & Heaney 2012). Moreover, the studies by Gupta and Newberry (1997); Holland (1998); and Richardson and Lanis (2008) produce mixed results. The studies by Stickney and McGee (1982); and Wilkinson, Cahan and Jones (2001) find no significant

relation between firm size and ETR. Although these different results may be attributable to different proxies used for firm size, different study periods, and different sample companies, the relation between firm size and ETR may warrant further investigation.

Profitability

Similar to firm size, the influence of profitability level on corporate tax avoidance is not consistently documented in prior studies. Wilkie (1988) and Wilkie and Limberg (1993) find a positive, though not linear, relationship between pre-tax accounting profit and ETR. However, since the two studies do not control for firm size (a factor closely related to profitability), the findings may be confounded by the firm size effect. Recognising this correlation, Rego (2003) argues that, when holding firm size constant, more profitable companies engage in more tax avoidance activities than their less profitable counterparts because of the lower costs of tax avoidance they face. In line with her argument, Rego (2003) documents a negative relation between profitability and ETR, after controlling for firm size. Manzon and Plesko (2002) concur that more profitable companies are in a better position to efficiently use tax deductions, tax credits and tax exemptions than are less profitable companies.

Nevertheless, several studies simultaneously considering firm size and profitability show a positive relation between profitability and ETR (e.g. Chen et al. 2010; Gupta & Newberry 1997; Richardson & Lanis 2008). It should be noted that, in these studies, the relation between firm size and ETR is not consistently strong across different sample periods and across models with different ETR measures. Therefore, it is questionable how profitability captures an aspect of firm-level characteristics different from firm size in terms of influencing ETR.

Foreign entities and foreign operations

Having subsidiaries or branches located in foreign countries with different (especially lower) tax rates offers an opportunity for companies to reduce their worldwide tax liabilities through the aforementioned cross-border profit shifting arrangements, such as intra-group transfer pricing. This opportunity is not available to domestic-operating companies. Previous studies, especially those in the U.S., recognise a positive relation between foreign operations and corporate tax avoidance. Anecdotal evidence—such as the case of Wachovia Bank discussed in McGill and Outslay (2004), and the case of Enron discussed in Bankman (2004)—clearly demonstrates the use of foreign entities for

corporate tax avoidance. Mills, Erickson and Maydew (1998) report that U.S. companies with foreign operations have greater investment in tax planning.

Empirical studies employ different measures of foreign operations, including, but not limited to, a foreign operation indicator that takes the value of 1 if the company has foreign operations (foreign income) and 0 otherwise (e.g. Frank, Lynch & Rego 2009), the extent of foreign operations expressed as the ratio of foreign income (or sales) to total income (or sales) or assets (e.g. Chen et al. 2010; Huseynov & Klamm 2012; Lisowsky 2010), and subsidiary location indicators (e.g. Rego 2003). Despite the different measures, the positive relation between foreign operations and corporate tax avoidance is widely recognised in U.S. studies.

Leverage

Leverage or debt financing is a way to avoid tax; however, the effect of leverage on ETR is not clear cut. Theoretically, leverage should not be an ETR determinant because interest expense is deductible for both accounting and tax purposes. Thus, adopting a highly leveraged capital structure is a book-tax conforming tax avoidance method. However, a number of studies reveal a negative relation between leverage and ETR (e.g. Frank, Lynch & Rego 2009; Markle & Shackelford 2012; Rego & Wilson 2012; Xian, Sun & Zhang 2015).[12] The explanations offered for the empirical results vary. Graham (2003) argues that companies may use debt financing because of the tax deductibility of interest expense, and would subsequently have higher leverage ratios. Mills, Erickson and Maydew (1998) view leverage as a proxy for a company's financial transaction complexity that provides an opportunity for tax avoidance. There are also studies finding no significant effect of leverage on ETR (e.g. Richardson & Lanis 2008).

Although not directly affecting ETR, leverage can be related to corporate tax avoidance in an alternative way. Several studies view issuing debt as one of the competing corporate tax avoidance mechanisms that take advantage of the tax deductibility of particular expenditures, such as depreciation and investment credits. DeAngelo and Masulis (1980) develop a model that predicts a negative relationship between the level of debt and level of available non-debt tax shields. Trezevant (1992) concurs and demonstrates that highly leveraged companies may have less need for non-debt tax shields. Graham and Tucker

[12] Frank, Lynch and Rego (2009) employ corporate tax avoidance proxies other than ETR, such as BTD. As discussed previously, BTD and ETR essentially capture the same concept.

(2006) propose that companies engaging in tax shelters would use less debt financing (lower leverage) to the extent that the tax shelters reduce tax.[13] Based on a sample of 44 tax shelter cases, Graham and Tucker (2006) find supporting evidence for the tax shelter substituting for use of debt. Wilson (2009) and Lisowsky (2010) also indicate that tax shelter use is negatively associated with leverage.

Thus, the relation between leverage and corporate tax avoidance measured by ETR requires further investigation. It is plausible that leverage *per se* does not affect ETR, yet shapes ETR by affecting other factors that are directly related to ETR.

2.6 Summary

This chapter provides a brief review of the corporate tax avoidance literature, mainly in the accounting discipline. Publicly listed companies typically adopt book-tax non-conforming tax avoidance arrangements that can largely be captured by ETR and its variants. For MNEs, intra-group transfer pricing and thin capitalisation (which are book-tax conforming tax avoidance) also appeal, and may be more potent than book-tax non-conforming tax avoidance. Moreover, prior studies document a number of firm-level characteristics that may affect corporate tax avoidance, such as firm size, profitability, foreign operations and leverage.

It should be noted that most prior studies are conducted using U.S. data. However, as will be discussed in the next chapter, the tax system in the U.S. differs from that in Australia, which may render some of the theories and findings in the U.S. studies not applicable in the Australian context.

[13] A tax shelter is defined by the U.S. Congress as an arrangement designed for the purpose of avoiding tax, without exposure to economic risk or loss (U.S. Department of the Treasury 1999).

Chapter 3: The Australian Dividend Imputation System—Mechanism and Literature Review

3.1 Introduction

This chapter introduces the Australian dividend imputation system, covering topics including the mechanism of the system, and the effect of the system on the capital market and corporate policies, as found in the literature.

The chapter is organised as follows. Section 3.2 provides an overview of the Australian dividend imputation system. Section 3.3 explains the mechanism of the system in terms of how companies allocate franking credits to their dividend distributions, and how franked and unfranked dividends are taxed in the hands of resident and non-resident shareholders. It also discusses the main schemes that might be adopted by companies to derive more tax benefits from the dividend imputation system than they are entitled to in the spirit of the law. Section 3.4 reviews prior studies on dividend imputation, with a focus on how it affects corporate policies. Finally, Section 3.5 summarises the chapter.

3.2 The Australian Dividend Imputation System: An Overview

The Australian dividend imputation system was introduced on 1 July 1987, with the provisions contained in Part IIIAA of the *Income Tax Assessment Act 1936* (hereafter ITAA 36). The primary objective of the dividend imputation system was to address the double taxation issue on corporate profits distributed to shareholders as dividends. Before introducing the imputation system, Australia operated a classical system similar to the one currently operating in the U.S. In the classical system, if corporate profits are distributed to shareholders as dividends, they are subject to double taxation: once at the corporate level in the form of corporate income tax, and again at the shareholder level in the form of personal income tax. In Australia, this double taxation on corporate profits placed companies in an unfavourable tax position, in comparison with other forms of business organisation and ownership, such as sole proprietorships, partnerships and trusts, which are not separate legal entities hence are not subject to income taxes other than the one levied on the sole proprietor, partners or beneficiaries. This asymmetrical treatment of business income across different forms of business organisation and ownership violated the efficiency principle, as it affected the business decisions of taxpayers. Thus,

the introduction of the dividend imputation system sought to encourage the use of companies as an organisation form to run business on a large scale.

The dividend imputation system helps achieve the objective of alleviating the double taxation on corporate profits by integrating corporate and shareholder taxes. The integration is accomplished by 'allowing resident corporate tax entities to pass on credits for income tax paid to their members and to allow their resident members to claim tax offsets for those credits' (Woellner et al. 2013). The specific mechanism of the system is discussed in detail in Section 3.3.

Since its introduction in 1987, the dividend imputation system has been amended several times. In 2002, the system was simplified to enable greater flexibility in distributing franked dividends and more consistent treatment across recipients of franked dividends. The new provisions are contained in Part 3-6 of the *Income Tax Assessment Act 1997* (hereafter ITAA 97), and have been effective since 1 July 2002. Table 3.1 summarises the main changes or amendments to the tax laws from 1988 to 2014 implemented to protect the integrity of the imputation system.

Among the changes or amendments, some have a positive effect on the demand, and subsequently the value, of franking credits (such as imposing 15% tax on the income and capital gains of superannuation funds, and allowing these funds to claim franking credits as tax offset), while others reduce the tax benefits of franking credits to some types of investors, thereby lowering the demand and value of franking credits (such as the provisions to prevent franking credit streaming or trading).

Table 3.1: Summary of Changes or Amendments Relevant to the Australian Dividend Imputation System 1988-2014

Year	Changes or Amendments
1988	Taxation on the income and capital gains of, and the eligibility to claim franking credit tax offset for, superannuation funds and friendly societies at a rate of 15%
1990	Provisions to prevent dividend streaming via multiple classes of shares
1991	Provisions to exclude mutual life insurance companies and friendly societies from the imputation system
1999	Provisions to prevent franking credit trading by foreign companies or exempt entities (announced in 1997 and effective from 1997, retrospectively)
2000	Holding period rule to require investors to hold a share for 45 days around the ex-dividend day to be entitled to the franking credit (effective from 1997)
2000	Entitlement to refund for excess or unused franking credits for individuals and superannuation funds
2002	Prohibition on dividend streaming
2003	Trans-Tasman imputation to allow New Zealand companies to attach Australian franking credits to dividends distributed to Australian shareholders, and to allow Australian companies to attach New Zealand franking credits to dividends distributed to New Zealand shareholders
2014	Dividend washing integrity rule to prevent dividend washing

In addition to those listed above, other changes incurred during the period also exert an influence on the value of franking credits. Importantly, in 1999, the capital gains tax was reduced, allowing a 50% discount on capital gains for individuals, and a one-third discount on capital gains tax for superannuation funds. The decrease in capital gains tax increases the value of capital gains relative to dividends, which subsequently reduces the value of franking credits. Moreover, the corporate tax rate has been gradually reduced from a record high of 49% in the late 1980s to 30% in 2002.

3.3 Mechanism of the Dividend Imputation System

3.3.1 Distribution of Franked Dividends

Generally, in the dividend imputation system, Australian resident corporate tax entities (for simplicity, ‘companies’ hereafter) are empowered to frank their dividend distributions—that is, to pass the Australian income tax paid at the corporate level to shareholders as franking credits. The amount of franking credits to be attached to

dividends is at the discretion of the companies. With the STR of 30% in Australia,[14] the maximum franking credits allowed under the law is:

$$\text{Maximum} = \text{Amount of franked distribution} \times \frac{\text{Corporate tax rate}}{1-\text{Corporate tax rate}}$$

$$= \text{Amount of franked distribution} \times \frac{0.3}{0.7} \qquad \text{Eq. (3.1)}$$

Assuming the absence of book-tax income difference, if the company distributes all its after-tax profits as fully franked dividends, the amount of franking credits would essentially be the amount of corporate income tax paid on the underlying profits.[15]

The franking percentage is the ratio of actual franking credits allocated to a distribution to the maximum franking credits allowed for that distribution, as shown in the following equation:

$$\text{Franking percentage} = \frac{\text{Actual franking credits allocated}}{\text{Maximum franking credits allowed}} \times 100\% \qquad \text{Eq. (3.2)}$$

The franking percentage ranges from 0% (unfranked) from 100% (fully franked).

Each company maintains a franking account to record its franking credits and franking debits on a rolling and tax-paid basis. Franking credits most commonly arise if the company receives franked dividends or pays Australian corporate income tax. Franking debits typically arise if the company distributes franked dividends or receives a refund of Australian corporate income tax. The franking account is in surplus (deficit) if the total franking credits are higher (lower) than the total franking debits at a particular time. Companies with franking account in deficit at the end of the year will be imposed with franking deficit tax. The payment of franking deficit tax can be offset against future corporate income tax in some situations. If the franking deficit at the year-end is greater than 10% of the total franking credits during the year, the company's entitlement to franking deficit tax offset will be reduced by 30% as a penalty. Therefore, to be able to distribute franked dividends, and to avoid franking deficit exceeding the penalty threshold,

[14] Small business company tax rate was 28.5% for the 2015-2016 financial year, and is 27.5% for the 2016-2017 financial year. The sample period in this thesis is from 2009 to 2012, during which all corporate tax entities were taxed at a rate of 30%.

[15] For example, a company generating a pre-tax profit of $100 pays Australian corporate income tax of $100 × tax rate (30%) = $30. If it distributes the after-tax profit, $70, as franked dividends to shareholders, then the maximum amount of franking credits that can be passed to shareholders is $70 × (0.3/0.7) = $30.

companies need to maintain a sound franking credit balance—for example, by paying Australian corporate income tax.

It should be stressed that foreign income tax payments do not lead to franking credits. This means that a company may not be able to distribute fully franked dividends if its profits from foreign operations have been subject to foreign taxes, yet not Australian tax.

3.3.2 Franking Credit Tax Offset

Australian resident companies are empowered to distribute franked dividends to their shareholders. However, upon receiving franked dividends, Australian resident and non-resident (foreign) shareholders are taxed differently, as elaborated in the following subsections.

Resident shareholders

Under Division 207 ITAA 97, when receiving franked dividends, resident shareholders include the amount of the dividends and the attached franking credits (which give the pre-corporate tax equivalent of the dividends or grossed-up dividends) in their assessable income, and pay income tax at their personal tax rates. A tax offset for the franking credits can be claimed. Section 67-25(1) ITAA 97, which has been effective since 1 July 2000, stipulates that, in cases where the tax offset exceeds the shareholder's total tax liability, the excess franking credits are fully refundable.

For illustration, Table 3.2 describes the effect of franked dividends on the tax liabilities of shareholders with different marginal tax rates. In all of the three scenarios, the dividend-paying company is assumed to have paid corporate income tax of 30% on the pre-tax profit of $100, and to have distributed all of the after-tax profit ($70) to its shareholder (for simplicity, assuming a single shareholder).

Table 3.2: Franking Credits Offset with Different Shareholder Tax Rates

	Scenario 1	Scenario 2	Scenario 3
Company Level:	$	$	$
Pre-tax corporate profit	100	100	100
Less Australian corporate income tax (30%)	-30	-30	-30
After-tax profit	70	70	70
Shareholder Level:			
Fully franked dividends received	70	70	70
Add franking credits attached	30	30	30
Included in assessable income	100	100	100
Shareholder tax (rates at 15%, 30%, 47%)	15	30	47
Less franking credit tax offset	-30	-30	-30
Tax at shareholder level	-15	0	17
After-tax return	**85**	**70**	**53**

In Scenario 1, the shareholder is taxed at 15%, which is the case for complying superannuation funds in Australia. If the shareholder tax rate is lower than the STR of 30%, the shareholder would receive a refund for the portion of franking credits that are in excess of the shareholder's income tax ($30 − $15 = $15). Consequently, the after-tax return of the shareholder is the total of the cash dividend of $70 and the tax refund of $15. In Scenario 2, where the shareholder's tax rate is the same as the STR (such as a corporate shareholder), no tax refund is receivable and no further tax is payable. In Scenario 3, where the shareholder is taxed at the top marginal personal tax rate of 47%, an additional tax of $17 ($47 − $30) is payable at the shareholder level.

As can be seen from Table 3.2, if the company distributes all its after-tax profit as fully franked dividends (with the maximum franking credits allowed), the total income tax paid by the company and its resident shareholder on the corporate profit is essentially equal to the underlying corporate profit taxed at the shareholder's marginal tax rate. In other words, for companies with resident shareholders, corporate profits distributed as fully franked dividends are only taxed once in the hands of the shareholders. Therefore, corporate income tax becomes only a pre-payment of shareholders' tax, and has no effect on the after-tax return on the investment. As such, the dividend imputation system integrates the corporate and shareholder taxes in the country, and ensures that the distributed corporate profits are only taxed once ultimately at the shareholders' marginal tax rates.

Non-resident shareholders

In accordance with Section 207-70 ITAA 97, non-resident or foreign shareholders do not enjoy the same tax benefits as resident shareholders in the Australian dividend imputation system. Specifically, if foreign shareholders receive franked dividends from Australian companies, no further Australian withholding tax on the dividend income is payable. However, in their countries of residence, foreign portfolio shareholders (those with shareholding of less than 10% of the issued equity shares of the Australian company) are liable to pay income tax on the dividend income, and cannot claim the franking credits received as tax offsets. Therefore, from the perspective of foreign shareholders, the underlying corporate profits from which dividends are paid out are subject to double taxation: once in Australia in the form of corporate income tax, and again in the shareholders' countries of residence in the form of personal income tax.

For a foreign non-portfolio investor (with shareholding of at least 10% of the voting power in the dividend-distributing company), such as the foreign parent company of a subsidiary operating in Australia, foreign tax on the non-portfolio dividends is likely to be exempt or can be deferred indefinitely, depending on the tax system adopted by the foreign investor's home country. If the country adopts a territorial tax system, the non-portfolio dividends are likely to be exempt from income tax (similar to Subdivision 768-A ITAA 97, or the former Section 23AJ ITAA 36, in Australia). If the country adopts a worldwide tax system (such as the U.S.), the investor's home country income tax in excess of foreign tax credit, if any, can be deferred indefinitely, as long as the Australian subsidiary does not pay dividends. In both cases, the more Australian corporate income tax the Australian subsidiary can avoid, the higher the after-tax returns from the Australian subsidiary will be.

3.3.3 Unfranked Dividends

As mentioned in Section 3.3.1, companies may be unable to distribute franked dividends if they do not have a sufficient franking credit balance, probably because of insufficient payment of Australian income tax. Unfranked dividends do not carry any franking credit that resident shareholders can claim as tax offset against their personal income tax. Foreign income tax payments on the underlying corporate profits out of which unfranked dividends are distributed would reduce shareholders' after-tax returns on the investment. The following example serves as an illustration.

Suppose an Australian parent company has a foreign subsidiary generating foreign-sourced profit. The subsidiary pays foreign income tax, and then distributes its after-tax profit as dividends to its Australian parent. Under Subdivision 768-A ITAA 97, the distribution (non-portfolio dividends) is generally exempt from tax in Australia. If the Australian parent company subsequently redistributes the foreign-sourced dividends to its shareholders as unfranked dividends, the shareholders pay income tax on the unfranked dividends at their applicable personal tax rates. Specifically, resident shareholders would include the amount of the unfranked dividends in their assessable income and pay tax at their marginal tax rates. No franking credit tax offset would be available. Under Section 128B ITAA 36, foreign shareholders would be subject to a withholding tax on the unfranked part of the dividends at a rate of 15% or 30%, depending on whether the foreign shareholder's country of residence has a tax treaty with Australia.

Therefore, if an Australian company pays foreign taxes on foreign profits and distributes unfranked dividends (out of the foreign profits) to shareholders, the foreign profits are taxed twice: once at the corporate level in the source countries, and again at the shareholder level in the form of income tax or withholding tax. Thus, the after-tax returns on the investment of the shareholders would be reduced by the two levels of tax.

3.3.4 Dividend Streaming and Franking Credit Trading

To circumvent the residency requirement of the Australian dividend imputation system, a number of arbitrage schemes have been created to increase the value of franking credits in the hands of foreign shareholders who cannot enjoy the franking credit tax offset. The two most commonly used schemes are dividend streaming and franking credit trading.

Dividend streaming refers to the strategy or arrangement where the flow of franked distributions is directed to shareholders who can benefit the most, to the exclusion of other shareholders. Generally, there are four situations where dividend streaming exists:

1. if the shareholder can choose to receive unfranked dividends in substitution for franked dividends (or vice versa)
2. if the shareholder can choose to receive tax-exempt bonus shares instead of franked dividends
3. if the shareholder can choose to receive unfranked or partially franked dividends from another company (such as an offshore associate of the Australian company) in substitution for franked dividends from the Australian company

4. if the shareholder can choose to receive franked dividends from one company (such as an Australian subsidiary of a foreign company) in substitution for unfranked dividends from another company (such as the foreign company).

Through dividend streaming, less franking credit is wasted in the hands of foreign shareholders, and more franking credits become available to resident shareholders.

Franking credit trading occurs when franking credits are transferred from the true economic owners of the shares, who bear the risk of holding the shares, yet do not value the franking credits, to others who can make more use of the franking credits. This is 'a market response to the incentives for tax arbitrage created by the imputation system' (Antioch 2001, p. 326). An example of franking credit trading is dividend stripping, where shares are purchased by a resident shareholder just before a franked dividend is paid, and sold back to the foreign true owner of the shares after the payment of the dividend.

In response to arbitrage schemes, such as dividend streaming and franking credit trading, which erode the tax revenue of the Australian government, the tax rules have been amended continuously. Other than the general anti-avoidance rules contained in Provision IVA ITAA 36, specific rules targeting dividend streaming and franking credit trading have also been introduced.[16]

To summarise, the Australian dividend imputation system allows domestic corporate income tax paid by the company to be claimed as tax offset against domestic shareholders' personal tax liabilities, thereby integrating the corporate and shareholder taxes, and subsequently providing a relatively neutral treatment of businesses in the form of companies and other entities.

3.4 Prior Studies on Dividend Imputation Systems

Prior studies on dividend imputation systems can be broadly categorised into three streams: valuation of franking credits, formation of dividend tax clienteles, and the effect of dividend imputation on corporate policies. This section provides a brief review of the existing studies on these three topics.

[16] See Table 3.1 for a summary of amendments relevant to the Australian dividend imputation system.

3.4.1 Valuation of Franking Credits

Understanding whether and how the dividend imputation system affects the domestic capital market, and subsequently the cost of equity for listed companies, forms the basis for understanding how the dividend imputation system affects corporate policies. Therefore, the valuation of franking credits becomes essential in developing the literature on the relationship between the dividend imputation system and corporate policies.

Despite the benefits of franking credit tax offset in the Australian dividend imputation system, the value of franking credits is not as intuitive as one might think. Factors such as shareholders' residency status and preference for a particular type of investment returns (such as capital gains, cash dividends or share repurchases) may contribute to the complexity in the valuation of franking credits. Extant studies attempting to estimate the market value of franking credits produce mixed results.

Studies before and during the early 1990s typically adopt the ex-dividend share price drop-off approach to infer the value of dividends and the attached franking credits.[17] The ex-dividend drop-off ratio is the decrease in the share price (P) on the ex-dividend day divided by the amount of dividends (D): $\Delta P/D$. A drop-off ratio of 1 implies that the ex-dividend share price decreases by exactly the amount of the dividends, in which case shareholders would be indifferent to trade shares across the dividend day. A drop-off ratio below 1 indicates that dividends are relatively tax disadvantaged, compared with other forms of investment returns, such as capital gains.[18] In a dividend imputation system, ΔP is expected to capture both the value of the dividends and the attached franking credits. If franking credits are of value to the market, an increase in the drop-off ratio following the introduction of the imputation system should be observed.

In the context of the Australian capital market, Brown and Walter (1986) report that, during the period 1973 to 1984 (before the dividend imputation system was introduced), the ex-dividend share price drop-off ratio was around 75% to 80%—significantly less than 1. The result can be interpreted as evidence for dividends being more heavily taxed,

[17] This approach is originally developed by Elton and Gruber (1970) to determine the marginal shareholder tax brackets.

[18] This interpretation is challenged by previous studies, such as those by Miller and Scholes (1978) and Kalay (1982), to have overlooked the existence of short-term traders and tax-exempt investors who are indifferent between capital gains and cash dividends. Short-term traders are taxed on the capital gains generated from selling the shares. Lakonishok and Vermaelen (1983) find supporting evidence for the argument that ex-dividend day share price behaviour reflects the trading activities of short-term investors.

and subsequently less preferred, than capital gains. Note that Australia did not introduce the capital gains tax until 1985. Therefore, shareholders would prefer corporate profits to be retained, rather than distributed, which would concomitantly increase the value of the shares. Selling the shares in a later period at a profit would not raise additional tax on the shareholders.

The study by Brown and Walter (1986) provide a benchmark for subsequent research examining the value of dividends and franking credits after the introduction of the dividend imputation system. A few later studies, also employing the ex-dividend share price drop-off ratio approach, show that, in the post-imputation period, the drop-off ratios are still significantly less than 1, and franking credits are only partially valued by the capital market. For example, Brown and Clarke (1993) examine the ex-dividend day drop-off ratios of shares from 1973 to 1991. Although they expect that the drop-off ratios would increase after the introduction of the imputation system, as dividends would become more attractive than capital gains, the results suggest a different story: the drop-off ratios initially declined in 1988 (one year after the introduction of the dividend imputation system), and bounced back in subsequent years, yet were still significantly less than 1. Brown and Clarke (1993) attribute the decreased drop-off ratios in 1988 to the market needing some time to recognise the value of franking credits.[19]

Moreover, Bruckner, Dews and White (1994) estimate that the value of franking credits increased from 33.5 cents per dollar of the face value for the period 1987 to 1990, to 68.5 cents for the period 1990 to 1993. Bellamy (1994) compares the ex-dividend day drop-off ratios for franked and unfranked dividends over the period 1987 to 1992. He finds that the average drop-off ratios for franked dividends exceeded that for unfranked dividends in every single year during the sample period. Overall, the average drop-off ratio for franked dividends was 0.89, whereas the average for unfranked dividends was 0.60 (Bellamy 1994). These findings suggest that franked dividends are perceived differently than unfranked dividends, thereby lending support to the hypothesis that the marginal investor in a company distributing franked dividends is a resident taxpayer who values franking credits to some extent.

[19] Another plausible explanation that is overlooked in Brown and Clarke (1993) is that Australia introduced the capital gains tax in 1985, and any gains from selling capital assets purchased before 20 September 1985 were tax exempt. Thus, it is likely that, in 1988, there were still many investors holding shares that had been purchased prior to the introduction of the capital gains tax, who subsequently preferred capital gains to cash dividends.

Hathaway and Officer (2004) provide a similar discussion. Using Australian Taxation Office data, combined with the drop-off ratio analyses, Hathaway and Officer (2004) estimate that approximately 71% of corporate tax payments were passed to shareholders in the form of franking credits over the period 1988 to 2002, and about 40% to 50% of the distributed franking credits were claimed by taxable shareholders as tax offset.

Despite its wide application in estimating the value of franking credits or franked dividends, the traditional ex-dividend share price drop-off ratio approach is criticised by a few researchers. For instance, since cum-dividend and ex-dividend shares are not traded contemporaneously, the time lag may cause the observed drop in share prices to be unable to accurately reflect the value of dividends or the attached franking credits.[20] To reduce the noises in share prices, Walker and Partington (1999) model the 'instantaneous' drop-off by observing share trading contemporaneously with and without dividends in the period between the ex-dividend day and the book's closing day.[21] With their relatively clean drop-off measure, Walker and Partington (1999) report that, for fully franked dividends, the instantaneous drop-off ratios are averaged at 1.23 across the trades, and at 1.15 across the ex-dividend event. This means that the market value of $1 of fully franked dividend is significantly higher than $1, suggesting that franking credits are of value to the market.

Studies from the late 1990s to the 2000s highlight the influence of the existence of foreign shareholders on the value of franking credits. The theoretical analysis undertaken by Wood (1997) indicates that the value of franking credits depends on the extent to which the Australian market is integrated with the world capital market, whereby greater integration would result in lower value of franking credits. Feuerherdt, Gray and Hall (2010) apply the ex-dividend drop-off approach to hybrid securities including reset preference shares and convertible preference shares, and show that franking credits attached to dividends are not fully valued by the market, if there is any value at all. They find evidence that 'the value of the package of a dividend and franking credit is, on average, equal to the amount of the dividend', which implies that, at one extreme, franking credits have no value if the cash dividend component is fully valued (Feuerherdt, Gray & Hall 2010, p. 388). This finding is consistent with the notion that the Australian

[20] For other limitations of the traditional ex-dividend drop-off approach, see Cannavan, Finn and Gray (2004) for details.

[21] The Australian Securities Exchange allows trading in cum-dividend shares, even after the official ex-dividend day, as long as it is before the book's closing day.

capital market is integrated with the world capital market, where the marginal investor is a foreigner who does not value franking credits.

Similar conclusions are drawn by Cannavan, Finn and Gray (2004). The authors estimate the value of cash dividends and franking credits based on the individual share futures contracts and the low exercise price options (unique derivative securities in the Australian market over the period 1994 to 1999). They find that, before the introduction of the 45-day rule to restrict the trading of franking credits, franking credits were valued at up to 50% of face value for high-yielding companies, but not for low-yielding companies, because of the high transaction costs that might prevent the effective transfer or trading of franking credits. However, with the 45-day rule, the estimated value of franking credits is insignificantly different from zero, implying that the marginal investor is a foreigner. It should be noted that the conclusions drawn in Cannavan, Finn and Gray (2004) may be limited to investors engaging in futures contract, and may not be generalised to long-term investors who may be less willing to incur the nontrivial transaction costs, such as commissions, and administrative and monitoring cost of engaging in futures contract.

Cummings and Frino (2008) extend the methods developed by Cannavan, Finn and Gray (2004) to estimate the value of franking credits based on the Australian Securities Exchange (ASX) 200 index-futures prices over the period 2002 to 2005. They reveal that about 52% of the franking credits were valued—a higher proportion than that reported in Cannavan, Finn and Gray (2004). The higher value may be attributable to the two significant changes in the law during the sample period of Cummings and Frino (2008), but not Cannavan, Finn and Gray (2004): the reduced capital gains tax effective from July 1999, and the refund for excess or unused franking credits from 2000.

Beggs and Skeels (2006) undertake a more comprehensive examination of the effect of the legislative amendments to the dividend imputation system on the value of franking credits. They study the ex-dividend share price drop-off ratios from 1986 to mid-2004—a period including almost all the amendments or changes in law to protect the integrity of the dividend imputation system. Before breaking down the entire sample period into several intervals to capture the effect of the amendments in the law, Beggs and Skeels (2006) find that, for the full sample, including both franked and unfranked dividends, the estimated gross drop-off ratios (for gross dividends, including the cash dividend component and franking credit component) were significantly less than 1, suggesting that the marginal investor did not fully value the gross dividends.

Similar results are also reported for the sub-sample including franked dividends only. Nevertheless, for the sub-sample including unfranked dividends only, the estimated drop-off ratios (the same as cash dividend drop-off ratios) were not significantly less than 1, from 1990 to 2003 (Beggs & Skeels 2006). Estimating the franking credit drop-off ratios separately from the cash dividend drop-off ratios, the authors find that the two were not significantly different from each other during the years 2002 to 2004, indicating that franking credits and cash dividends were valued equally. However, in most of the years by 2000, franking credits were found to be not valued.

After partitioning the sample periods based on the timeline of the legislative amendments, Beggs and Skeels (2006) show that the franking credit drop-off ratios increased significantly after 2000 (exclusive), suggesting that the allowance of refunding unused franking credits introduced in 2000 appears to permanently increase the value of franking credits.

In short, prior studies on the valuation of franking credits generate mixed results regarding whether and to what extent franking credits are valued by shareholders. Although the inconsistent findings across studies may be attributable to the different and imperfect estimation approaches used and the different periods covered, the effect of the inability of foreign shareholders to claim the franking credit tax offset on the valuation of franking credits should not be overlooked. Further, the degree of integration into the international capital market also plays a role. In the small and open economy of Australia, large listed companies are likely to have foreign investors. For these companies, the cost of equity capital is determined by supply and demand in the international capital market, where the Australian dividend imputation system may not exert any influence. For small listed companies that have limited access to foreign capital, the imputation system may help them reduce the cost of newly raised equity capital. However, this effect depends on the extent to which their cost of equity capital is affected by that of large companies.

3.4.2 Formation of Dividend Tax Clienteles

The concept ‘dividend tax clienteles’ refers to a group of investors who prefer the company in which they invest to follow certain dividend policies. The theory of dividend tax clienteles predicts that investors for whom dividends are tax disadvantaged relative to capital gains will invest in no- or low-dividend-paying companies, whereas investors for whom dividends are less or not tax disadvantaged will invest in (high-) dividend-paying companies (Miller & Modigliani 1961). The existence of dividend tax clienteles implies

that the trading volume around ex-dividend days will increase, as these two types of investors will trade with each other (Dhaliwal & Li 2006). Several U.S. studies, such as the study by Dhaliwal, Erickson and Trezevant (1999), find supporting evidence for the dividend tax clienteles theory.

In the Australian dividend imputation system, since franking credits can only be claimed by resident shareholders as tax offset and are wasted in the hands of foreign shareholders, it follows that companies distributing franked dividends would be preferred by resident investors.

Bellamy (1994) argues that, if shares are valued on an after-tax basis, then the ex-dividend day drop-off, reflecting the after-tax value of the dividend, would be greater for a 'franked share' (shares with franking credits) than for an 'unfranked share' (p. 277), assuming that the marginal investor is a taxed resident.[22] In his study, the drop-off ratio for franked shares exceeded that for unfranked shares in every single year from 1987 to 1992, supporting the dividend tax clientele hypothesis (Bellamy 1994).

However, the causality direction of the observed dividend tax clienteles effect is questionable. The studies by Lasfer (1996) and Blouin, Raedy and Shackelford (2011) indicate that companies take into account their shareholders' tax positions when determining dividend policies. Thus, it is possible that companies and investors move simultaneously: the former want to attract new and maintain existing investors, and the latter want to maximise their after-tax returns by investing in companies with their preferred dividend policies.

To summarise, the existence and triggering factor of the observed clustering of certain investors around certain companies is inconclusive. Arguably, the introduction of the dividend imputation system may cause changes in the ownership structure of companies, as domestic investors would prefer companies distributing franked dividends; it may also cause changes in the dividend policies of companies, as domestic companies seeking (domestic) investments would distribute franked dividends to attract or maintain their investors.

[22] As aforementioned, there are studies suggesting that the marginal investor in the Australian market is a foreign investor.

3.4.3 Influence on Corporate Policies

Although little consensus is achieved regarding the extent to which the dividend imputation system affects the cost of equity capital for listed companies, the influence of the system on corporate dividend and financing policies is widely recognised. Moreover, some preliminary empirical evidence on the corporate tax avoidance-reducing effect of the system also emerges.

The dividend imputation system and classical system shape corporate policies differently, primarily because of their different tax treatments on distributed corporate profits. The classical system is featured with double taxation on corporate profits distributed as dividends: once at the corporate level in the form of corporate income tax, and again at the shareholder level in the form of dividend income tax. The dividend imputation system alleviates the double taxation problem by allowing shareholders to claim corporate income tax as attached to dividends as franking credits to offset their personal income tax. Thus, provided that franking credits are at least partially valued by the market, corporate policy decision makers need to consider the preference of the market and formulate policies accordingly.

Dividend policies

Following the introduction of the dividend imputation system in Australia, significant increases in dividend payouts, particularly franked dividend payouts, have been observed. Data from the Australian Taxation Office (2015b) indicate that, since the introduction of the imputation system, at the aggregate level, franked dividend payments increased from 35,050 in number or $15,193,952,518 in value in 1988/1989, to 155,500 in number or $101,475,003,954 in value in 2012/2013, despite the increase in the number of sample companies from 420,500 to 854,745 over this period.

This increase can be largely attributable to the increased demand of franking credits from the market participants, especially superannuation funds. As aforementioned, superannuation funds are taxed at a concessional rate of 15%, and are allowed to claim the full franking credits received (the excessive franking credits can be refunded). Therefore, provided that franking credits are valued by the market, companies are motivated to distribute franked dividends to maintain their current shareholders and attract new investors. Coleman, Maheswaran and Pinder (2010) conduct mail surveys and face-to-face interviews with financial executives in large companies to explore the

companies' dividend and finance decisions. They find that the ability to distribute franking credits constitutes one of the determinants of corporate dividend policies, as approximately 41% of the respondents view the level of franking credits available for distribution as important or very important (Coleman, Maheswaran & Pinder 2010).

Bellamy (1994) examines the dividend policies of Australian listed companies for the five years after the introduction of the imputation system. He indicates that, after adjusting for the changes in the number of shares issued, the dividend paid per share was higher for companies distributing franked dividends than for companies distributing unfranked dividends, in every single year from 1988 to 1992 (Bellamy 1994). Further regression analyses show a significantly positive association between dividend payments and franking level, triangulating the above finding (Bellamy 1994).

Also exploring the influence of the imputation system on corporate dividend policies, Pattenden and Twite (2008) argue for a tax-induced preference on franked dividends because distributing franked dividends is the only way to allow shareholders to enjoy the benefit of the franking credit tax offset. Consistent with the argument, their study reports increased initiation and payments of dividends in the wake of the dividend imputation system. Within regular dividends, Pattenden and Twite (2008) also find increased use of dividend reinvestment plans (DRPs). DRPs are appealing to shareholders because they allow shareholders to reinvest the dividends received to purchase new shares at a discounted price. DRPs are also favoured by companies because they contribute to retained earnings, which is an inexpensive source of finance. Importantly, Pattenden and Twite (2008) document a positive relationship between dividend payout ratios and franking credit availability (measured by corporate ETR in the previous year).[23]

Previous research also examine the influence of the dividend imputation system on different forms of dividends. In addition to the increasingly used DRPs (Pattenden & Twite 2008), share repurchases also attract attention. For instance, Brown, Handley and O'Day (2015) demonstrate that Australian companies use off-market share repurchases (containing a dividend component to which franking credits can be attached) to distribute franking credits in excess of the needs of ordinary dividends. This behaviour is inconsistent with the 'dividend substitution hypothesis' (that companies substitute share

[23] However, they also find that, before the introduction of the dividend imputation system, the relationship between corporate ETR and dividend payout ratios was negative (Pattenden & Twite 2008).

repurchases for dividends) documented in the U.S. which operates a classical system (e.g. Grullon & Michaely 2002; Skinner 2008).[24]

Henry (2011) draws a similar conclusion. Based on a sample of ASX 300 companies for the period 1992 to 2008, Henry (2011) reports that the mean and median values of dividend distributions were 68.4% and 63.2%, respectively, and the mean and median values of total dividend payments including share repurchases were 77.1% and 66.4%, respectively. The small discrepancies between dividend distributions and total dividends including share repurchases are interpreted by Henry (2011) as evidence against the 'dividend substitution hypothesis'.

In short, the introduction of the dividend imputation system results in increased investor preference for franked dividends as the form of return on their investment. To cater to this preference, companies are motivated to distribute franked dividends. Nigol (1992, p. 42) proposes that 'where the payment of franked dividends is concerned, there is an optimal dividend policy: companies should pay dividends to the limit of their franking account balances'. It should be highlighted that maintaining the policy of distributing a high level of franked dividends calls for corporate financing and tax policies to change accordingly, which are discussed below.

Financing policies

In the classical system, the pecking order theory suggests that companies prioritise their financing choices based on the associated costs, and, accordingly, retained earnings should be the most preferred source of finance, followed by external debt, with new equity regarded the 'last resort' (Myers & Majluf 1984; Myers 1984). Retained earnings are not subject to the adverse selection problem, hence serve the most preferred source of finance. When internal financing is insufficient, external financing via issuing debt or equity is required. For an outside investor, in comparison with investing in debt, investing in equity is riskier because of the greater information asymmetry between investors and managers, which should be compensated by a higher rate of return. Thus, the lower information costs associated with debt makes it a preferred source of external financing over equity. Subsequent studies such as Shyam-Sunder and Myers (1999) provide supporting evidence.

[24] In the U.S., although the *Jobs and Growth Tax Relief Reconciliation Act of 2003* leads to dividends being taxed at a concessional rate of 15%, dividends are still slightly tax disadvantaged, relative to capital gains, mainly because capital gains tax can be delayed.

After reviewing the relevant literature following Myers and Majluf (1984), Barclay and Smith (1999) argue that taxes, contracting costs and information costs are all important determinants of corporate financing decisions. For tax reasons, a higher level of debt results in greater interest expense for tax deduction, thereby reducing corporate tax liability, and subsequently increasing after-tax corporate profit. In contrast, dividend distributions are not tax deductible.[25] For contracting costs, higher leverage (more debt financing) may lead to higher costs of financial distress, including the direct expense associated with administrating bankruptcy, and indirect costs resultant from increased difficulty in getting investment. Lastly, the information costs associated with issuing debt and issuing equity also differ. Due to the information asymmetry between managers and outside investors, equity issuance may signal to the market about the overvaluation of the equity, as perceived by the managers who are assumed to have better knowledge about the company's true financial position and financial performance than do outside investors. In contrast, debt issuance may signal to the market that the managers are confident about the company's future performance hence its ability to fulfil the obliged interest payments to debtholders. Therefore, the choice between debt financing and equity financing hinges on the managers' perception of the true condition of company.

The above studies assume the classical system, while the determinants of corporate financing policies and their respective importance in other types of tax systems have been largely overlooked. In particular, tax may not appear as a primary consideration in the classical system: it may make debt financing preferred over equity financing because of the tax deductibility of interest expense, but not dividends. However, in a dividend imputation system, tax may constitute one of the most important determinants of corporate financing policies, as exposited below.[26]

In a dividend imputation system, to benefit from the franking credit tax offset, shareholders may prefer (domestically) taxed corporate profits to be distributed as franked dividends, instead of being retained as the internal source of finance. As a result of a high level of franked dividend payouts, retained earnings may decrease to a level insufficient to finance profitable projects. Thus, the leading position of retained earnings

[25] Barclay and Smith (1999) also argue that, considering the total tax, including corporate tax and shareholder tax, the tax advantage of debt financing over equity financing would be less than the tax savings from interest expense because shareholders, upon receiving dividends (distributed out of higher after-tax corporate profit because of the tax savings), would also be taxed.

[26] In articulating the relationship between the dividend imputation system and corporate financing decisions, it is assumed that at least some shareholders of the companies indeed value franking credits.

as the best source of finance may be challenged. Moreover, the preference of debt over equity may be reversed in a dividend imputation system. With the imputation mechanism, corporate income tax paid becomes a pre-payment of shareholders' personal tax and does not reduce shareholders' after-tax wealth. As Pattenden (2006, p. 70) states, the imputation mechanism makes it 'equivalent to the corporation paying dividends out of pre-tax income'. Graham (2003, p. 1099) proposes that franking credits have 'an effect analogous to making equity (at least partially) tax deductible, which reduces the net tax advantage of debt'. If companies still use debt financing to avoid corporate tax (as interest expense is tax deductible), less franking credits would be available and less franked dividends can be distributed. This would disappoint domestic shareholders, especially superannuation funds, which can use the excessive franking credits to reduce tax on other income, or even obtain a refund. Therefore, debt financing may no longer be a preferred source over equity financing.

Twite (2001) examines changes in corporate leverage ratios, retained earnings and new equity issues following the introduction of the dividend imputation system in Australia, and documents a substitution effect of equity for debt. Specifically, the median level of leverage ratios experienced small increases during the years 1986 to 1988, which could be attributed to the introduction of the capital gains tax (making debt financing tax-favoured). However, after 1988, the median level of leverage ratios dropped back (the level in 1997 was even lower than that in 1982). This indicates a decline in the preference for debt after the introduction of the dividend imputation system. For retained earnings as a proportion of total capitalisation, the median level decreased from 0.139 in 1988 to 0.099 in 1997, despite slight fluctuations in between. For equity issues, the change in the ratio of issued ordinary shares to total capitalisation exhibited the opposite pattern to leverage ratios—it decreased until 1985, yet increased after 1988. All these changes are consistent with the substitution effect of equity for debt after the introduction of the dividend imputation system.

Recent studies comparing Australia with other (developed) countries on corporate leverage ratios or equity financing yield similar conclusions to Twite (2001). For example, Fan, Titman and Twite (2012) show that, during the period 1991 to 2006, across 39 countries, Australian listed companies exhibited the lowest median leverage ratio—less

than 0.1.[27] Similarly, Alcock, Finn and Tan (2011) report that the median leverage ratio of 147 Australian top 400 companies (by average market capitalisation) during the period 1989 to 2006 was 0.18. In another international comparison, Melia, Docherty and Easton (2016) find that, across their sample period from 1976 to 2010, the average annual change of shares on issue was 4% in the U.S. (Pontiff & Woodgate 2008), yet 19% in Australia. More importantly, in Australia, the figure was 11% before the introduction of the dividend imputation system, yet almost doubled to 21% afterwards (Melia, Docherty & Easton 2016).

The observed decreased leverage ratios, combined with the increased equity issues of Australian listed companies, provide evidence that the dividend imputation system results in increased preference of equity over debt as a source of finance. Hamson and Ziegler (1990) argue that a clientele situation regarding financing decisions (debt versus equity) may occur in the dividend imputation system, as companies with resident shareholders may prefer equity financing, whereas companies with foreign shareholders may still stick to debt financing. Thus, the documented substitution effect of equity for debt in the post-imputation period in Australia may serve as indirect evidence that franking credits are at least partially valued by the market.

Corporate tax policies

Importantly, corporate tax policies in a dividend imputation system may also differ from those in a classical system. In a classical system, such as the system in the U.S., publicly listed companies typically engage in corporate tax avoidance activities (e.g. Dyreng, Hanlon & Maydew 2008; Frank, Lynch & Rego 2009), and the trend of tax avoidance is increasing over time (e.g. Desai 2003; Manzon & Plesko 2002). As discussed in Chapter 2, corporate tax avoidance incentives come from both the shareholder (principals) side and manager (agents) side. First and foremost, shareholders want to reduce corporate income tax because it reduces the after-tax returns on their investment. Since they do not run the business on a daily basis, but delegate their rights to the company managers, they typically formulate remuneration contracts in a way that motivates managers to engage in corporate tax avoidance activities.

[27] Fan, Titman and Twite (2012) include 1,554 Australian listed companies in the sample, representing about 50% (in number) of the listed companies in Australia, and 79% of the share market capitalisation in Australia (time series median value).

Second, from the managers' perspective, their motivation comes from not only the higher remuneration or bonus that they can obtain upon achieving tax savings, but also from the use of complex structures concomitant of engaging in tax avoidance arrangements to conceal their diversion of corporate resources for their private use. The diversion of corporate resources can be tackled by implementing strong corporate governance. Thus, arguably, the shareholders' strong incentives to reduce corporate income tax are the primary reason for the observed significant corporate tax avoidance.

However, in a full dividend imputation system, such as the system in Australia, shareholders may not have strong incentives to (motivate managers to) avoid corporate income tax, as long as they can benefit from the franking credit tax offset. The dividend imputation system allows companies to pass corporate income tax as franking credits to shareholders. Upon receiving franked dividends, shareholders include both the amount of the dividends and amount of the attached franking credits in their assessable (taxable) income, and pay income tax at the applicable personal tax rates. An offset for the received franking credits can then be claimed against their personal tax liabilities. Thus, the total tax paid by the company and its shareholders on the underlying corporate profit is essentially equal to the amount of tax on the profit at the shareholders' level only. In this sense, corporate income tax is only a pre-payment of shareholders' tax, and does not reduce shareholders' after-tax returns on their investment. Therefore, in contrast to the scenario in the classical system, shareholders in the dividend imputation system may not have strong incentives to avoid corporate income tax.

Empirical studies on the influence of the dividend imputation system on corporate tax avoidance are comparatively sparse. This subsection reviews three studies on the topic, with the aim of laying the foundation for this thesis. Among the three studies, the first study investigates corporate tax avoidance in the New Zealand dividend imputation system. New Zealand operates a full dividend imputation system, similar to Australia. The second study is a cross-country study that explores how different degrees of dividend imputation affect corporate tax avoidance. The third study examines corporate tax avoidance in the Australian dividend imputation system, which this thesis builds and improves on.

The first study is conducted by Wilkinson, Cahan and Jones (2001), investigating how dividend imputation shapes New Zealand companies' incentives to avoid tax. The authors first argue for a positive (negative) relation between foreign ownership and corporate tax

avoidance (average ETR) as foreign shareholders are denied the franking credit tax offset. They then argue for a moderating effect of dividend payout ratios on the aforementioned positive relation. They posit that companies with high foreign ownership and high dividend payout ratios would have lower average ETR (greater tax avoidance) because foreign shareholders cannot access the distributed franking credits, while companies with high foreign ownership yet low dividend payout ratios would have higher average ETR (less tax avoidance) because foreign shareholders are less disadvantaged. Moreover, in 1993, New Zealand introduced the foreign investor tax credit (FITC) regime to allow foreign portfolio investors to partially enjoy the tax benefits of the imputation system.[28] Thus, the authors propose that the introduction of the FITC would reduce the tax avoidance incentives of companies with foreign portfolio investors, thereby further moderating the combined effect of foreign ownership and dividend payout ratios on average ETR.

To test the proposed moderating effects, Wilkinson, Cahan and Jones (2001) employ longitudinal data for 37 New Zealand companies for the five-year period from 1991 to 1995, which covered two years before and two years after the introduction of the FITC in 1993. The regression results support all of the proposed moderating effects argued above (a negative relation between average ETR and the interaction of foreign ownership and dividend payouts, and a positive relation between average ETR and the three-way interaction of foreign ownership, dividend payouts and the FITC dummy variable). However, the foreign ownership variable *per se* is found to be positively related to average ETR, indicating that, before the introduction of the FITC, without dividend payouts (and keeping the control variables constant), companies with greater foreign ownership had higher average ETR hence less tax avoidance. The authors do not provide an explanation for this seemingly counterintuitive finding. Overall, Wilkinson, Cahan and Jones (2001) provide one of the earliest pieces of empirical evidence that the dividend imputation system may reduce companies' incentives to avoid tax.

The second study is conducted by Amiram, Bauer and Frank (2013), and is a cross-country study on the influence of the degree of dividend imputation on corporate tax avoidance. The authors exploit recent changes in shareholder dividend tax policies across 28 OECD countries over the period 1994 to 2008. During this period, the countries

[28] Australia does not have a similar regime to allow foreign investors to (partially) enjoy the franking credit tax offset.

exhibited different degrees of dividend imputation policies in terms of the length of time of adoption and/or whether full or partial imputation was adopted. Amiram, Bauer and Frank (2013) regress a number of corporate tax avoidance measures on the country-level dividend imputation policy variables, as well as firm-level characteristics that are expected to affect corporate tax avoidance.[29]

Using a difference-in-difference approach, Amiram, Bauer and Frank (2013) find that, in general, companies under dividend imputation systems have relatively low corporate tax avoidance. For Australia in particular, following the changes in the Australian dividend imputation system in 2002, which created greater imputation benefits, companies are found to have lower corporate tax avoidance than before. In countries where imputation systems were abolished, corporate tax avoidance is found to increase after the abolishment. This is especially true for companies paying dividends and for companies with foreign assets. Moreover, Amiram, Bauer and Frank (2013) also demonstrate that companies under full dividend imputation systems, on average, have the lowest corporate tax avoidance, compared with companies under partial imputation systems or no imputation system. In addition, companies that are more closely held by shareholders (indicating greater alignment between managers and shareholders) in imputation systems have lower tax avoidance (Amiram, Bauer & Frank 2013).

In short, Amiram, Bauer and Frank (2013) provide some empirical evidence on the reduced corporate tax avoidance in dividend imputation systems. One issue that should be noted is that, the foreign operations measure in their study is a dummy variable that cannot capture how different degrees of foreign operations affect corporate tax avoidance. Possibly because of this dichotomous measure of foreign operations, Amiram, Bauer and Frank (2013) document mixed results regarding the influence of foreign operations on corporate tax avoidance. Moreover, foreign ownership is not taken into account. As

[29] Amiram, Bauer and Frank (2013) use four corporate tax avoidance measures:

(a) $\text{Corporate statutory tax rate} - \frac{\text{Taxes paid}}{\text{Pre-tax income adjusted for special items}}$,

(b) $\text{Corporate statutory tax rate} - \frac{\text{Taxes paid}}{\text{Net operating cash flows with taxes paid added back}}$,

(c) $\frac{\text{Taxes paid}}{\text{Pre-tax income adjusted for special items}} \div \text{Corporate statutory tax rate}$

(d) $\frac{\text{Taxes paid}}{\text{Net operating cash flows with taxes paid added back}} \div \text{Corporate statutory tax rate}$.

The firm-level characteristics are profitability, leverage, firm size, presence of foreign operations, growth opportunities (book-to-market ratio), consecutive accounting losses, constrained cash flow resources, intangible assets, R&D intensity, capital intensity, and financial reporting aggressiveness (performance-adjusted discretionary accruals).

discussed before, if the shareholders of the companies are primarily foreigners who do not value franking credits, then dividend imputation systems can barely alter the companies' tax avoidance strategies.

The third and most relevant study is conducted by Ikin and Tran (2013), examining the effect of dividend imputation on corporate tax avoidance in the Australian dividend imputation system. In particular, Ikin and Tran (2013) investigate whether the extent of franked dividend distributions, share option-based manager remuneration, corporate income tax rate falls, and tax office scrutiny affect the corporate tax strategies of listed Australian companies over the years 1999 to 2003. Ikin and Tran (2013) proxy corporate tax aggressiveness or tax avoidance by the ratio of ETR (total income tax expense to pre-tax accounting profit) to STR, and the ratio of ETR' (current income tax expense to pre-tax accounting profit) to STR. They control for factors that are suggested to affect the two tax aggressiveness measures, including firm size, foreign operations, R&D expenditures, capital intensity, profitability and industry affiliation.

Ikin and Tran (2013) find that companies distributing more franked dividends adopt a more conservative tax strategy (defined as not pursuing reductions in corporate income tax through tax planning) than do companies distributing unfranked dividends or not distributing dividends. Further, they find that managers who are remunerated with share options adopt conservative tax strategies. With share options-based remuneration tied to share performance, managers have incentives to take actions to increase the share price. Given that franking credits are valued by shareholders, managers are willing to adopt conservative tax strategies to ensure sufficient corporate income tax payments for distributions of franked dividends. They also find that large companies under close scrutiny by the taxation office adopt conservative tax strategies to avoid penalties and reputation damages. Finally, in the years preceding tax rate reductions, companies continue to adopt conservative tax strategies, as shifting income and deductions across periods are costly and may not help save tax.

Overall, Ikin and Tran (2013) provide evidence that, in the Australian dividend imputation system, corporate managers tend to adopt conservative tax strategies. As with Amiram, Bauer and Frank (2013), Ikin and Tran (2013) do not examine the effect of foreign ownership on corporate tax avoidance because of data paucity. Further, the foreign operations measure in their study is the ratio of foreign revenue to total revenue.

This measure may overestimate foreign operations because foreign revenue may include revenue from exporting to foreign countries that is actually sourced in Australia.

In a nutshell, prior studies indicate that, in a dividend imputation system, companies increase their franked dividend distributions to satisfy domestic shareholders' need for franking credits, increase their preference for issuing new equity as a source of finance, and decrease their engagement in tax avoidance activities. However, it should be stressed that the effect of dividend imputation on corporate policies largely depends on the extent to which shareholders can enjoy the franking credit tax offset.

3.5 Summary

This chapter explains the mechanism of the Australian dividend imputation system and reviews prior studies examining the effect of dividend imputation on valuation of franked dividends and subsequently corporate policies. Only Australian corporate income tax can be attached to dividends as franking credits, and only Australian resident shareholders can claim the franking credits received as tax offset; thus, the extent to which dividend imputation shapes corporate policies depends on how much the tax benefits can be enjoyed by the shareholders.

The influence of dividend imputation on corporate tax policies seems to have been insufficiently investigated. Among the three studies reviewed in this chapter, Wilkinson, Cahan and Jones (2001) examine a relatively small sample of 37 New Zealand companies, while Amiram, Bauer and Frank (2013) and Ikin and Tran (2013) do not examine the effect of shareholder residency because of data paucity. Despite these drawbacks, the corporate tax avoidance-reducing effect of dividend imputation appears to be supported with preliminary empirical evidence.

This thesis builds on Ikin and Tran (2013) to provide a more comprehensive investigation of the effect of dividend imputation on corporate tax avoidance in the Australian context. The following three chapters examine how franked dividend distributions, foreign operations and foreign ownership affect corporate tax avoidance. Specifically, Chapter 4 provides an overall investigation, and Chapters 5 and 6 focus on the influence of foreign operations and foreign ownership, respectively, on corporate tax avoidance in the Australian dividend imputation system.

Chapter 4: Effect of Franked Dividends, Foreign Ownership and Foreign Operations on Corporate Tax Avoidance in Australia

4.1 Introduction

This chapter addresses the first research question raised in Chapter 1:

Does the Australian dividend imputation system alleviate the corporate tax avoidance of Australian listed companies? If so, how does the system achieve this? Do franked dividend distributions, foreign ownership and foreign operations affect corporate tax avoidance?

After reviewing the mechanism of the Australian dividend imputation system in Chapter 3, this study argues that the Australian dividend imputation system has a corporate tax avoidance-reducing effect for listed Australian companies. This effect should be more pronounced for companies with greater franked dividend distributions, a lower proportion of foreign shareholders, and less extensive foreign operations, as they can pass a higher percentage of corporate income tax in the form of franking credits to shareholders who can use the credits as tax offset. In other words, these companies are hypothesised to engage in less corporate tax avoidance than their counterparts with less franked dividend distributions, higher foreign ownership, and more extensive foreign operations.

To test the hypothesis, this study employs a sample of Australian listed companies from the DatAnalysis Premium database over the period 2009 to 2012. It uses OLS regression analyses, with a corporate tax avoidance measure (CETR) regressed on variables that measure franked dividend distributions, foreign ownership and foreign operations. This study also includes control variables, such as firm size, industry affiliation dummy variables and year dummy variables. CETR is the current income tax expense, excluding adjustment for the previous year(s) and including adjustment for the current year, as reported in the subsequent year, divided by pre-tax accounting profit before the share of associates' profit or loss. The lower the CETR, the greater the corporate tax avoidance.

The regression results indicate that CETR is significantly positively associated with franked dividend distributions, and significantly negatively related to foreign ownership, lending support to the hypotheses that companies distributing more franked dividends or

having a lower proportion of foreign ownership engage in less corporate tax avoidance. However, the relationship between CETR and foreign operations is not statistically significant, possibly because of companies shifting foreign profits to Australia to pay Australian income tax to frank their dividends. The additional analysis shows that, when an Australian company with foreign ownership pays more franked dividends to meet the demands of its Australian shareholders, it tends to engage in less corporate tax avoidance.

The remainder of this chapter is organised as follows. Section 4.2 reviews the relevant literature and develops hypotheses. Section 4.3 describes the research design. Section 4.4 reports the regression results and analyses. Section 4.5 provides robustness checks. Section 4.6 discusses the limitations of the research design. Section 4.7 summarises and concludes the chapter.

4.2 Literature Review and Hypotheses Development

4.2.1 Franked Dividend Distributions and Corporate Tax Avoidance

Franking credits (also called imputation credits) are of value to resident shareholders who can claim the credits as tax offset against their personal tax liabilities. However, franking credits have no value unless passed to shareholders via dividend distributions. Thus, as proposed by Howard and Brown (1992), the introduction of the dividend imputation system creates a bias towards dividend payments. Monkhouse (1993) demonstrates that, with dividend imputation, the optimal dividend policy is to pass franking credits to shareholders on a timely basis to avoid the loss of value as time passes. Nigol (1992, p. 42) argues that 'companies should pay dividends to the limit of their franking account balances'.

Indeed, significant increases in dividend distributions are observed in the post-imputation periods in Australia. A study published by the Reserve Bank of Australia documents an approximate 38% increase in real dividends per share between 1985/1986 and 1990/1991, and estimates that about 20% was attributable to tax changes, including the introduction of the dividend imputation system in 1987 (Callen, Morling & Pleban 1992).[30] Recent data from the Australian Taxation Office show that, since the introduction of the imputation system, at the aggregated level, the number (value) of franked dividend

[30] The other changes include the introduction of the capital gains tax and the taxation of the earnings of superannuation funds.

payments in 2012/2013 was around 4.4365 (6.6786) times as large as that in 1989/1990, despite the almost doubled number of companies included in the sample over the period (Australian Taxation Office 2015b).

In the academic literature, Bellamy (1994) find that increases in dividends are greater for companies distributing franked dividends than for companies distributing unfranked dividends. Pattenden and Twite (2008) report that companies raise their dividend initiations, dividend payouts and DRPs in the post-imputation periods. Brown, Handley and O'Day (2015) and Henry (2011) show that Australian companies use off-market share repurchases to distribute franking credits in excess of the needs of ordinary dividends.

The prevalence of franked dividends in Australia can be largely explained by the tax benefits of franking credits, as well as the signalling effect of taxed corporate profits from which franked dividends are distributed. Specifically, distributing fully franked dividends allows companies to pass the corporate income tax to shareholders as franking credits, which can be used to offset shareholders' tax liabilities. This means that distributed corporate profits are only taxed in the hands of shareholders at their personal tax rates. Thus, corporate income tax becomes only a pre-payment of shareholders' tax and does not reduce shareholders' after-tax returns.

This tax offset benefit is more profound for superannuation funds that comply with superannuation regulations and are taxed at a rate of 15%—that is, only half the STR of 30%.[31] Thus, upon claiming the 30% franking credits from fully franked dividends received, superannuation funds can not only reduce the dividend income tax to zero, but can also reduce the tax liabilities on their other income or obtain a tax refund. This generous tax benefit is so evident that investing in companies that pay franked dividends is recognised and used as an active practice to manage taxes of funds (Mackenzie & McKerchar 2014). Apelfeld, Fowler and Gordon (1996) show that tax-aware investment funds outperform tax-unaware funds on an after-tax basis. Jun, Gallagher and Partington (2011) report that pension funds are overweight in shares with fully franked dividends, and underweight in shares with partially franked or unfranked dividends. It is clear that superannuation funds exhibit an investment preference for companies distributing fully franked dividends. Given that superannuation funds are the major shareholders of listed

[31] Superannuation funds in pension mode are taxed at 0%.

Australian companies, their investment preference encourages a high level of franked dividend distributions.[32]

Apart from the tax benefits associated with franking credits, the pervasiveness of franked dividends in Australia can also be explained by the signalling effect of taxed corporate profits. To be more specific, taxed corporate profits from which franked dividends are distributed are perceived as more persistent than untaxed corporate profits because they contain less management discretions. Coulton, Ruddock and Taylor (2014, p. 1310) propose that 'dividend and their tax status are expected to serve a signal of earnings persistence'. They find that companies distributing fully franked dividends have significantly more persistent earnings than do companies distributing unfranked dividends. Similarly, a number of studies—such as those by Blaylock, Shevlin and Wilson (2012); Hanlon (2005); Jackson (2009); and Weber (2009)—show that larger BTD is associated with less persistent earnings.

Earnings persistence is an important consideration when making investment decisions. Thus, for companies distributing unfranked dividends (possibly because of insufficient franking credit balance as a result of insufficient payment of domestic corporate income tax) or companies with large BTD (indicating possible earnings management), shares may be undervalued. Prior studies show that investors reduce their expectations on earnings persistence for firm-year observations with large BTD (Hanlon 2005) and rely on current earnings to a lower extent (Joos, Pratt & Young 2000). Moreover, Hanlon (2005) finds that analysts view large BTD as a red flag for future earnings problems and produce less optimistic (less negative) forecast errors (the difference between realised earnings and forecast earnings).

In short, the tax benefits of franking credits and the positive signalling effect of taxed corporate profits explain shareholders' preference for franked dividends, hence the increased prevalence of franked distributions by Australian listed companies. To avoid adverse reactions from shareholders, companies typically adopt stable dividend policies (e.g. Brav et al. 2005; Denis & Osobov 2008; Lintner 1956). This means that companies distributing franked dividends for a particular year are likely to have been and continue distributing franked dividends. To keep a stable dividend policy of making franked

[32] Australian institutional investors, largely consisting of superannuation funds and managed funds, were the largest single class of investor of listed Australian equities before 2007. From 2007 to 2010, their ownership remained at around 45% (Black & Kirkwood 2010).

distributions, companies need to constantly pay sufficient Australian corporate income tax to maintain a sound franking credit balance. Thus, the current study hypothesises that companies distributing more franked dividends engage in less corporate tax avoidance than do companies distributing less franked dividends, as engaging in tax avoidance arrangements not only reduces franking credit availability, but also requires substantial tax planning costs. This leads to the first hypothesis in this chapter:

Hypothesis 4.1: Ceteris paribus, companies with higher franked dividend distributions engage in less corporate tax avoidance (and thus have higher CETR) than do companies with lower franked dividend distributions.

This hypothesis is similar to the one tested in Ikin and Tran (2013); however, Ikin and Tran (2013) do not incorporate a foreign ownership measure in their regression model because of data paucity. As will be discussed in the following subsections, this study simultaneously considers franked dividend distributions, foreign ownership and foreign operations.

4.2.2 Foreign Ownership and Corporate Tax Avoidance

In the Australian dividend imputation system, foreign shareholders do not benefit as much as resident shareholders. Specifically, if foreign shareholders receive franked dividends from Australian companies, no further Australian withholding tax on the dividend income is payable. However, in their countries of residence, foreign shareholders are liable to pay income tax on the dividend income, and cannot claim the franking credits received as tax offsets.[33]

Therefore, from the perspective of foreign shareholders, the underlying corporate profits from which dividends are paid out are subject to double taxation: once in Australia in the form of corporate income tax, and again in the shareholders' countries of residence in the form of personal income tax. This means that, for foreign shareholders, Australian tax reduces their after-tax returns, and franking credits are of no value.

Prior studies demonstrate that the franking credits are not fully valued by the Australian capital market, possibly because of the participation of foreign investors who do not

[33] If foreign shareholders receive unfranked dividends from Australian resident companies, a withholding tax will be imposed at a rate of 30% or 15%, depending on whether their countries of residence have a tax treaty with Australia. Regardless of whether franked or unfranked, the dividends are not subject to further income tax in Australia.

benefit from the franking credit tax offset. Wood (1997) develops a model to recognise both resident and foreign shareholders in the Australian capital market, and finds that the value of franking credits capitalised into the price of shares that offer a great amount of franking credits is between 0.6 and 1. More recent studies, such as those by Cannavan, Finn and Gray (2004) and Feuerherdt, Gray and Hall (2010), show that franking credits are not of significant value, which implies that the marginal investor in the Australian market is a foreign investor.

Since the Australian dividend imputation system does not alleviate double taxation on the distributed profits for foreign shareholders, and foreign shareholders do not value franking credits, Australian companies with more foreign ownership may have stronger incentives to engage in corporate tax avoidance to maximise their foreign shareholders' after-tax returns than companies with less foreign ownership. This leads to the second hypothesis in this chapter:

Hypothesis 4.2: Ceteris paribus, companies with greater foreign ownership engage in more corporate tax avoidance (and hence have lower CETR) than do companies with lower foreign ownership.

4.2.3 Foreign Operations and Corporate Tax Avoidance

The Australian dividend imputation rules stipulate that only Australian corporate income tax can be attached to dividends as franking credits, which makes foreign income taxes a cost to be minimised to maximise shareholders' after-tax returns on their investment.[34] Therefore, companies with foreign operations which are paying foreign income taxes would have incentives to engage in foreign tax avoidance. However, Australian income tax does not need to be minimised, as long as shareholders can benefit from the franking credit tax offset.

Foreign tax avoidance can be achieved in three ways. First, the foreign subsidiary of the Australian parent company can undertake tax-advantaged or tax-favoured investments locally in the foreign country where it operates. Examples of such investments include

[34] In general, Australian companies are required to pay Australian income tax on their global income. However, non-portfolio dividends paid by a foreign company to an Australian company and income from a foreign branch of an Australian company are non-assessable, non-exempt income under Subdivision 768-A ITAA 97 (in place of the previous Section 23AJ ITAA 36) and Section 23AH ITAA 36, respectively. These two provisions effectively make Australian companies' foreign business income exempt from Australian income tax.

activities that attract full or partial income tax exemption; purchasing or holding business property, plants and equipment that are allowed accelerated depreciation deduction under the local tax laws; and incurring expenditures that may be capital in nature, yet can be claimed as immediate deduction under the local tax laws. Second, more effectively, the group can shift foreign profits to other countries with relatively low tax rates, or even to tax havens, by means of activities such as intra-group transfer pricing. These two foreign tax avoidance approaches result in reduced foreign taxes and hence reduced overall tax liabilities, which include both Australian and foreign taxes.[35] It follows that companies with foreign operations are expected to have lower tax liabilities (and hence lower CETR) than otherwise similar companies with predominantly domestic operations.

The third foreign tax avoidance approach is to shift foreign profits back to the parent or other group members in Australia (inward profit shifting). As a result of this inward shifting, a greater proportion of the group's worldwide profit is taxed in Australia and a greater proportion of the corporate income taxes paid can be passed to shareholders as franking credits. With this approach, companies with foreign operations are expected to have similar tax liabilities (and hence similar CETR) to otherwise similar companies with predominantly domestic operations, although they indeed avoid foreign taxes.

To take into account the different effects of the above three foreign tax avoidance methods on a company's overall tax liability, this study develops two competing hypotheses regarding the relationship between foreign operations and corporate tax avoidance:

Hypothesis 4.3A: Ceteris paribus, companies with more extensive foreign operations have lower tax liabilities than do companies with lesser foreign operations.

Hypothesis 4.3B: Ceteris paribus, companies with more extensive foreign operations have similar tax liabilities to companies with lesser foreign operations.

The literature has not adequately addressed the effect of foreign operations on corporate tax avoidance in dividend imputation systems. For instance, Amiram, Baur and Frank (2013) demonstrate that the existence of foreign operations is associated with greater tax avoidance. However, the foreign operations indicator (a dichotomous variable) they use cannot capture how different degrees of foreign operations affect corporate tax avoidance. Further, in their cross-country study, Amiram, Baur and Frank (2013) consider the

[35] The Australian accounting standards do not require separate disclosure of foreign taxes and Australian tax.

existence of foreign operations as a control variable and do not provide a direct test of whether, in dividend imputation systems, corporate tax avoidance is greater for companies with foreign operations. Ikin and Tran (2013) measure foreign operations as the ratio of foreign revenue to total revenue, and find an insignificant association between foreign operations and corporate tax avoidance in the Australian dividend imputation system. However, it should be noted that 'foreign revenue' may include revenues from foreign customers that can be generated by exporting. This revenue is still sourced in Australia. Therefore, unless the 'foreign revenue' is sourced in foreign countries (that is, the income-generating activity is undertaken in foreign countries), the foreign operations measure may not capture the degrees of foreign operations well.

4.3 Research Design

4.3.1 Regression Model

The following OLS regression model is employed to test the relationships between corporate tax avoidance and franked dividend distributions, foreign ownership and foreign operations in the Australian dividend imputation system:

$$\text{CETR} = \alpha + \beta_1 \text{FDD} + \beta_2 \text{FOW} + \beta_3 \text{FOP} + \beta_4 \text{SIZE} + \beta_{5\text{-}22} \text{IND} + \beta_{23\text{-}25} \text{YEAR} + \varepsilon$$

Eq. (4.1)

where:

- CETR: current effective tax rate—the corporate tax avoidance measure
- FDD: franked dividend distributions
- FOW: foreign ownership
- FOP: foreign operations
- SIZE: firm size
- IND: industry dummy variables[36]
- YEAR: year dummy variables[37]
- ε: the regression error term.

[36] There are 19 industries in total where the sample companies operate. Thus, 18 industry dummy variables are created. The base industry is Energy, with a GICS code of 1010.

[37] There are four years across the sample period. Therefore, three year dummy variables are created. The base year is 2009.

Based on the hypotheses developed in Section 4.2, the coefficient for the franked dividend distributions measure (FDD), β_1, is expected to be significantly positive (Hypothesis 4.1); the coefficient for the foreign ownership measure (FOW), β_2, is expected to be significantly negative (Hypothesis 4.2); and the coefficient for the foreign operations measure (FOP), β_3, is expected to be significantly negative (Hypothesis 4.3A) or insignificantly different from zero (Hypothesis 4.3B). The definitions for each of the variables in the above regression model are explained below.

4.3.2 Variables in the Regression Model

Dependent variable: CETR

CETR is employed as the dependent variable to proxy for corporate tax avoidance. The specific definition of CETR is shown in Equation (4.2) as follows:

$$\text{CETR} = \frac{\text{Current income tax expense} + \text{Tax adjustment} - \text{Royalties and resource rent tax}}{\text{Pre-tax accounting profit before the share of associates' profit or loss}}$$

Eq. (4.2)

Both the numerator and denominator take into account discontinued operations because discontinued operations contribute to the overall profitability of the company, and subsequently affect the company's tax liability.[38]

Efforts are made to develop a relatively 'clean' and 'precise' measure of a company's tax liability for a particular year (the numerator of the CETR measure). Specifically, the first component of the numerator, current income tax expense (for year *t*), does not include adjustment for the over- or under-provision of current income tax for the previous year (year $t - 1$). This exclusion makes the current income tax expense figure unaffected by adjustments to the previous year's current income tax, and therefore relatively 'clean'. The second component, tax adjustment, refers to the adjustment to the current year's current income tax expense (year *t*) that is reported in the subsequent year's annual report (year $t + 1$). The current year's current income tax expense (year *t*) may need to be adjusted subsequently to correct any over- or under-estimation as more (accurate)

[38] For discontinued operations, in most cases, income tax expense, rather than current income tax expense, is disclosed (in notes to financial statements). Since the income tax expense attributable to discontinued operations is unlikely to be deferred, in cases where the current income tax expense attributable to discontinued operations is not separately disclosed, income tax expense attributable to discontinued operations is used as the replacement.

information becomes available in the subsequent year (year $t + 1$).[39] The inclusion of this second component makes the current income tax figure relatively 'precise'. Lastly, royalty-related taxation (royalties) and resource rent tax are excluded because they are better regarded as part of cost of goods sold than as income tax.[40]

With regard to the denominator, pre-tax accounting profit is employed to proxy for the economic income of the company. The share of associates' profit or loss is excluded because it is an after-tax figure, and the share of associates' current income tax expense is not included in the numerator of CETR.

The corporate tax avoidance measure, CETR, is superior to the traditional ETR or traditional CETR and cash ETR as a proxy for tax avoidance of Australian listed companies. Compared with the traditional ETR (the ratio of total income tax expense to pre-tax accounting profit) which reflects the permanent difference between taxable income and pre-tax accounting profit, CETR captures both permanent and temporary differences. It is also a more precise measure of the corporate tax liability for a particular year than the traditional CETR (the ratio of current income tax expense to pre-tax accounting profit) and cash ETR (the ratio of cash tax paid to pre-tax accounting profit) because it incorporates adjustment to current tax expense for the current period and excludes adjustment for the prior period. As discussed in Chapter 2, the amount of cash tax paid during a year consists of partial tax liabilities for two years: it includes the cash tax paid for the current year (first three quarterly PAYG instalments) and the cash tax paid for the previous year (last PAYG instalment and final balance on assessment).

The degree of corporate tax avoidance can be indicated by comparing CETR with STR (30% in Australia). The lower the CETR relative to the STR, the greater the extent of corporate tax avoidance.

Independent variables of interest: FDD, FOW and FOP

The independent variables of interest in this chapter are franked dividend distributions (FDD), foreign ownership (FOW) and foreign operations (FOP).

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[39] For a company in year *t*, its last PAYG instalment and final balance on assessment are to be paid in year $t + 1$.

[40] Royalty-related taxation and resource rent tax are levied based on the mining production output. Thus, they do not change in proportion to profit.

(1) Franked dividend distributions (FDD)

Franked dividend distributions (FDD) is the proportion of after-tax profit for a year that is (to be) paid out as franked dividends. It is measured by dividing the total amount of franked interim, final and special dividends for the year by the after-tax profit excluding the amount attributable to non-controlling interest, as shown in the following Equation (4.3):

$$\text{FDD} = \frac{\begin{array}{c}\text{Interim dividend} \times \text{Franking percentage} + \text{Final dividend} \times \\ \text{Franking percentage} + \text{Special dividend} \times \text{Franking percentage}\end{array}}{\begin{array}{c}\text{After-tax accounting profit excluding the amount attributable to} \\ \text{non-controlling interest}\end{array}}$$

Eq. (4.3)

It should be noted that the interim, final and special dividends included in the numerator are dividends that are declared for the year.[41] Special dividends are included because they can affect the franking credit availability, thereby influencing the company's tax paying or tax avoidance behaviour. Moreover, for consolidated groups, the denominator of FDD does not include the portion of the after-tax profit that is attributable to non-controlling interest because the franked dividends in the numerator are those paid to the shareholders of the parent company.

(2) Foreign ownership (FOW)

The foreign ownership variable, FOW, measures the extent to which a company is owned by foreign investors. To this study's knowledge, there are no firm- or year-specific foreign ownership data available from either commercial databases or company annual reports for Australian listed companies. Therefore, this study constructs a foreign ownership measure based on the top 20 shareholders' information disclosed in annual reports, which show the 20 largest shareholders' names and respective numbers and percentages of shareholdings for each firm-year observation.[42] Efforts are made to identify the nationalities of the top 20 shareholders by referring to the Osiris database which shows the nationalities of some company shareholders (including individuals and family trusts). However, the ownership information in the Osiris database is not always current; thus,

[41] In most cases, interim dividends declared for the year are also paid during the year, while final dividends declared for the year are paid in the next year.

[42] Prior studies, such as those by Wilkinson, Cahan and Jones (2001) and Chu (2011), also use the top 40/top 20 or top 10 shareholders' information to develop their ownership composition measures.

additional efforts are made to search for the shareholders (mainly corporate shareholders) from some credible websites, such as Bloomberg and ASIC Connect, to identity their nationalities.[43] The foreign ownership measure, FOW, is defined as follows in Equation (4.4):

$$\text{FOW} = \frac{\text{Percentage of foreign shareholdings}}{\text{Total percentage of the top 20 shareholdings}}^{44} \qquad \text{Eq. (4.4)}$$

In defining 'foreign' ownership, New Zealand shareholders are treated as Australian shareholders because the Australian and New Zealand governments have extended their dividend imputation systems to include companies residing in the other country under the trans-Tasman triangular imputation rules contained in *Taxation Laws Amendment Act (No. 6) 2003*. The rules allow Australian companies with New Zealand operations and New Zealand shareholders to provide franking credits to New Zealand shareholders for New Zealand corporate income tax paid, proportionate to New Zealand shareholders' ownership of the Australian company, and vice versa for New Zealand companies with Australian operations and Australian shareholders. Therefore, the double taxation on the income generated from New Zealand operations is alleviated to some extent. Consequently, Australian companies with New Zealand operations and shareholders may not have strong incentives to reduce Australia and New Zealand corporate income taxes. In addition, FOW assumes that the percentage of foreign shareholdings among the top 20 shareholders also applies to the non-top 20 shareholders.

(3) Foreign operations (FOP)

The foreign operations measure, FOP, captures the extent to which a company operates in foreign countries. Prior studies use various proxies for foreign operations, such as the ratio of foreign income on lagged assets (e.g. Chen et al. 2010), the presence of foreign

[43] The ASIC is responsible for the registration and regulation of companies in Australia. Despite all the efforts made, the nationalities of some shareholders—most of whom are individuals—remain unidentified. For this study, these shareholders are assumed to be Australian resident shareholders. As a result, companies' foreign ownership may be under-estimated.

[44] For example, if the top 20 shareholders hold 60% of the shares of the company, and, among the 60%, 15% (collectively) is owned by foreign shareholders, then FOW would be calculated as: FOW = 15% ÷ 60% = 25%.

income (e.g. Amiram, Baur & Frank 2013; Frank, Lynch & Rego 2009), and the existence of a subsidiary in a tax haven (e.g. Lisowsky 2010).

In this study, a company's extent of foreign operations is determined based on the geographical segment (non-current) assets information. Specifically, the extent of foreign operations is measured by the ratio of segment non-current assets or segment assets located in foreign countries to total segment non-current assets or total segment assets, respectively, depending on which information is disclosed in the notes to financial statements.[45]

Foreign income (sales or operating result) information is not used because companies may export goods or services to foreign customers without having a physical presence in foreign countries. Exporting income still constitutes Australian income on which companies need to pay Australian tax, and the tax paid can be passed to shareholders as franking credits. Thus, FOP in this study is a refined measure of foreign operations when compared with other measures relying on foreign revenue or foreign income, as it is better able to capture the physical operations in foreign countries. The specific calculation of FOP is shown in Equation (4.5) below:

$$\text{FOP} = \frac{\text{Segment (non-current) assets located in foreign countries}}{\text{Total segment (non-current) assets}} \qquad \text{Eq. (4.5)}$$

As with FOW, in defining FOP, New Zealand is not treated as a 'foreign' country. In fact, during the data collection process, it is found that a substantial number of companies do not disclose New Zealand operations separately from Australian operations in their segment reporting, which makes it impossible to isolate their segment (non-current) assets located in New Zealand.

[45] In the segment reporting (notes to financial statements), some companies disclose segment non-current assets, and some companies disclose segment assets. In cases where both types of information are disclosed (very rare cases), the non-current assets figures are used in calculating FOP, because they can better capture the physical operations in foreign countries.

Control variables: SIZE, IND and YEAR

To control for the influence of other factors on CETR, the following control variables are included in the regression model: firm size, industry affiliation dummy variables, and year dummy variables. [46]

(1) Firm size (SIZE)

In the literature, firm size is recognised to have a strong association with corporate tax avoidance. However, as discussed in Chapter 2, no consensus has been achieved regarding whether the association is positive or negative. This study argues that, in the Australian dividend imputation system, the larger the sizes of the companies, the more likely their shares are included in the investment portfolios of institutional investors (such as superannuation funds) who prefer and expect the companies to pay franked dividends. Therefore, compared with small companies, large companies may have greater incentives to pay Australian corporate income tax to frank their dividends.

Firm size is measured by the natural logarithm of sales revenue, rather than total assets, because sales revenue can best reflect firm size, especially for companies with electronic commerce.

(2) Industry dummy variables (IND)

Companies operating in different industries have different tax liabilities because of different cost structures, different levels of capital intensity, different levels of R&D investment, and different industry-specific tax treatments (such as special tax concessions). For instance, companies in the technology and pharmaceuticals industries typically incur substantial R&D expenditures that may attract tax concessions. Consequently, these companies may have lower taxable income and lower tax expense compared with companies with similar pre-tax accounting profit, yet not benefiting from the tax concessions. Industry affiliation effect is controlled for by including industry dummy variables based on the four-digit GICS codes.

(3) Year dummy variables (YEAR)

[46] Firm fixed effects model is not employed. It lacks power as there are only two observations per firm on average. Nevertheless, firm specific control variables are considered in the main tests and the additional analyses (including robustness checks).

Year-specific characteristics—such as general economic conditions and changes in tax laws—may also lead to variations in CETR. Therefore, year dummy variables are included as control variables.

(4) Other firm-level CETR influential factors

Apart from firm size, a few other firm-level characteristics are also suggested in prior studies to have significant influence on ETR, including capital intensity, R&D intensity and leverage. These factors are not controlled for in the regression model for the following reasons. Although capital intensity and R&D intensity are theoretically negatively associated with corporate tax liabilities, their effect on CETR can be at least partially captured by industry affiliation dummy variables. Given that companies operating in the same industry would have similar levels of capital intensity and R&D intensity, any exceptionally high levels of capital or R&D intensity might be attributed to the deliberate use of tax concessions for corporate tax avoidance. Leverage is not included as a control variable because interest expense is deductible for both accounting and tax purposes in Australia, and does not create any book-tax income difference. Higher leverage ratios do not result in CETR being lower than the STR.[47]

4.4 Sample and Regression Results

4.4.1 Sample

The sample covers a four-year period from 2009 to 2012. The year 2009 is chosen as the starting year to reduce the influence of the global financial crisis on companies' profitability levels hence tax payments. The year 2012 is selected as the ending year to prevent potential changes in companies' tax avoidance arrangements in anticipation of the *Action Plan on Base Erosion and Profit Shifting*, released by the OECD in 2013 to address corporate tax avoidance via cross-border profit shifting.

The initial sample consists of companies listed on the ASX from 2009 to 2012, from the commercial database, DatAnalysis Premium, with a total of 7,783 firm-year observations.[48] Relevant financial data are obtained from DatAnalysis Premium to assist

[47] In the Robustness Checks section, analyses are performed to incorporate additional control variables including profitability, capital intensity, intangible intensity, leverage, growth opportunity, and cash flow constraint. The results are presented in Appendix D.
[48] The DatAnalysis Premium database includes companies listed on the ASX and New Zealand Exchange (NZX). Companies listed on the NZX are first excluded.

identification of firm-year observations, for which data items, such as current tax expense, are hand-collected from annual reports. During the identification process, the following firm-year observations are excluded:

1. Foreign companies: the Australian dividend imputation system does not apply to foreign companies.
2. Financial companies, trust funds and stapled securities: financial companies are subject to special regulations and disclosure requirements. Trust funds and trusts in stapled securities are 'pass-through' entities for tax purposes (trust income is not taxed at the trust level, but at the beneficiaries or unit-holders level).
3. Utilities companies: these companies are subject to special rules that regulate prices charged on utilities, thereby affecting their financial performance measures.
4. Dual-listed companies, including BHP Billiton and Rio Tinto Group: a dual-listing corporate structure enables companies to maximise the imputation benefits. The Australian company in a dual-listing structure is able to distribute franked dividends to its predominately Australian shareholders to minimise the franking credits wasted on foreign shareholders' hands.
5. Firm-year observations with non-positive pre-tax accounting profit before the share of associates' profit or loss: CETR cannot be computed if the denominator is 0; CETR is likely to be negative and subsequently difficult to interpret if the denominator is negative.
6. Firm-year observations with non-positive income tax expense [49]: for an observation with positive pre-tax accounting profit, income tax expense may be non-positive because of using prior years' tax losses to reduce the current year's tax liability. An observation is likely to have a non-positive current income tax expense if its total income tax expense is non-positive.
7. Firm-year observations with incomplete data or only half-year data.[50]

[49] In the regression analyses, current income tax expense, rather than income tax expense, is employed as the main component in the numerator of the tax avoidance measure, CETR. Excluding observations with non-positive income tax expense may result in over-exclusion, yet helps achieve a high level of efficiency in the data collection process because current tax expense data have to be hand-collected from financial reports.

[50] Examples of observations with incomplete data include observations without annual reports available for access, observations without the top 20 shareholders' information available in annual reports, and observations with no sales revenue (a required data item for the regression analyses). Firm-year observations without sales revenues mainly operate in the metal and mining industry. They may have gains from sales of assets and investments.

The above seven exclusions result in a total of 1,309 firm-year observations, for which data are hand-collected from notes to financial statements in annual reports.

To ensure that the regression results are not dominated by extreme cases, the following firm-year observations are excluded before performing regression analyses:

1. Firm-year observations with CETR greater than 1 or less than 0 [51]: this is a common practice in prior studies (e.g. Gaertner 2014; Hoopes, Mescall & Pittman 2012; Ikin & Tran 2013; Li & Tran 2016). [52]
2. Firm-year observations with a dividend payout ratio greater than 1 or less than 0.[53]
3. Firm-year observations with CETR significantly affected by use of tax losses, which are observations using tax losses from prior years (whether or not previously recognised as a deferred tax asset) that reduce current income tax expense by more than 5%.[54]
4. Firm-year observations with CETR significantly affected (by more than 5%) by changes in tax rates or tax laws.

The above exclusions result in a sample of 888 firm-year observations. Table 4.1 summarises the sample identification and selection procedure.

[51] Firm-year observations with non-positive pre-tax accounting profit before the share of associates' profit or loss, and firm-year observations with non-positive income tax expense are already eliminated in steps (5) and (6). However, these two exclusions do not ensure that firm-year observations with CETR greater than 1 or lower than 0 are eliminated.

[52] Some studies winsorise their ETR measure to be between 0 and 1, while other studies truncate the sample to include observations with an ETR measure between 0 and 1. This study adopts the truncation approach because setting negative CETR to be 0 would create bias towards 0, and setting CETR that is greater than 1 to be 1 would create bias towards 1.

[53] Dividend payout ratio is the total of interim, final and special dividends for the year, divided by after-tax accounting profit, excluding the amount attributable to non-controlling interest.

[54] Rather than excluding all observations using tax losses from prior years, the 5% threshold is used to maintain a sample size that is as large as possible. If companies using prior years' tax losses to reduce the current year's tax were kept in the sample, they would appear as tax-avoiding firms (because of asymmetrical treatments of profit and loss in tax law).

Table 4.1: Sample Reconciliation

	2009	2010	2011	2012	Total
Companies listed on Australian Securities Exchange (ASX) as obtained from DatAnalysis Premium database*	1958	2030	1769	2027	7784
Less foreign incorporated companies listed on ASX	59	79	50	95	283
Less financial companies, trust funds, and stapled securities	264	264	259	288	1075
Less utilities companies	33	33	25	27	118
Less dual-listed companies	2	2	2	2	8
Less firm-year observations with non-positive pre-tax accounting profit before the share of associates' profit or loss	1161	1149	1021	1164	4495
Less firm-year observations with non-positive income tax expense	94	129	92	90	405
Less firm-year observations with incomplete data or only half-year data	20	21	18	32	91
Total for data collection	**325**	**353**	**302**	**329**	**1309**
Less firm-year observations with CETR greater than 1 or less than 0	28	31	30	32	121
Less firm-year observations with a dividend payout ratio greater than 1 or less than 0	22	34	26	31	113
Less firm-year observations with CETR significantly affected by utilisation of tax losses	45	38	30	37	150
Less firm-year observations with CETR significantly affected by changes in tax rates or tax laws	0	18	5	14	37
Total for regression analyses	**230**	**232**	**211**	**215**	**888**

* DatAnalysis Premium database includes companies listed on the Australian Securities Exchanges (ASX) and New Zealand Exchange (NZX). Companies listed on the NZX are first excluded.

4.4.2 Descriptive Statistics

Table 4.2 presents the descriptive statistics of the variables (numbers are rounded to four decimal places). Table 4.3 presents the frequency of industry dummy variables. For CETR, the mean and median values are 0.2526 and 0.2712, respectively. Given that CETR captures tax concessions and subsidies (such as the accelerated depreciation of non-current assets allowed under tax rules, R&D tax concessions, and tax subsidies to mining companies), the mean and median of CETR are expected to be lower than 0.3 (STR).[55] Prior studies also report that the mean and median values of the ratio of current income tax expense to pre-tax accounting profit lies between 0.2 and 0.3 for Australian listed companies (e.g. Li & Tran 2016; Tran & Yu 2008). Ikin and Tran (2013) show that, on average, the ratio is 84% of the corporate tax rate.[56] CETR ranges from 0 to 0.9838.

The franked dividend distributions measure, FDD, has a mean and median value of 0.3990 and 0.4485, respectively. It ranges from 0 to 0.9998, indicating that, at one extreme, some companies distribute unfranked dividends or zero dividends, while, at the other extreme, some companies distribute nearly all their after-tax profits as fully franked dividends.

The foreign ownership measure, FOW, ranges from 0 to 0.9831. The mean value of FOW is 0.0535, meaning that, on average, the sample companies have about 5.35% foreign ownership. The median value is 0, suggesting that at least 50% of the sample companies do not have foreign investors as one of the top 20 shareholders. Further investigation reveals that many of the firm-year observations with FOW greater than 50% (17 out of 42) operate in the Materials sector (GICS code 1510).

The foreign operations measure, FOP, ranges from 0 to 1. It has a mean of 0.1340 and a median of 0, meaning that, although the sample companies have approximately 13.4% foreign operations on average, at least half do not have segment (non-current) assets located in countries other than Australia and New Zealand. Further investigation indicates that, of the 102 firm-year observations with FOP greater than 50%, the most

[55] R&D tax concessions result in permanent differences between pre-tax accounting profit and taxable income. Tax subsidies to mining companies are essentially accelerated depreciation allowed for exploration and prospecting expenditure incurred by mining companies, which result in temporary differences.

[56] Ikin and Tran (2013) employ a sample period from 1999 to 2003, during which the STR experienced reductions from 36% to 30%.

representative industry groups are Materials (26 observations), Energy (18 observations) and Consumer Durables & Apparel (14 observations).

The firm size, SIZE, has a mean and median value of 18.9670 and 18.8101, respectively, with a range of 11.4721 to 24.7783.

Table 4.2: Descriptive Statistics

Variables	Mean	Median	Std. Dev.	Min	Max	Skewness	Kurtosis
CETR	0.2526	0.2712	0.1363	0	0.9838	0.5871	6.1145
FDD	0.3990	0.4485	0.3165	0	0.9998	0.0287	1.6741
FOW	0.0535	0	0.1597	0	0.9831	3.5664	15.5548
FOP	0.1340	0	0.2764	0	1	2.1687	6.4308
SIZE	18.9670	18.8101	1.8341	11.4721	24.7783	0.0857	4.0189

CETR is calculated as (current income tax expense + tax adjustment – royalties and resource rent tax) / pre-tax accounting profit before the share of associates' profit or loss. FDD is calculated as (interim dividend × franking percentage + final dividend × franking percentage + special dividend × franking percentage) / (after-tax accounting profit excluding the amount attributable to non-controlling interest). FOW is calculated as the percentage of foreign shareholdings / total percentage of the top 20 shareholdings. FOP is calculated as segment (non-current) assets located in foreign countries / total segment (non-current) assets. SIZE is the natural logarithm of sales revenue.

Table 4.3: Frequency of Industry

Industry (Four-digit GICS codes)	Industry	Frequency	Percentage of Firm-year Obs.
1010	Energy	57	6.42
1510	Materials	118	13.29
2010	Capital Goods	145	16.33
2020	Commercial & Professional Services	84	9.46
2030	Transportation	27	3.04
2510	Automobiles & Components	7	0.79
2520	Consumer Durables & Apparel	41	4.62
2530	Consumer Services	56	6.31
2540	Media	33	3.72
2550	Retailing	86	9.68
3010	Food & Staples Retailing	10	1.13
3020	Food, Beverage & Tobacco	32	3.6
3030	Household & Personal Products	7	0.79
3510	Health Care Equipment & Services	46	5.18
3520	Pharmaceuticals, Biotechnology & Life Sciences	18	2.03
4510	Software & Services	75	8.45
4520	Technology Hardware & Equipment	14	1.58
4530	Semiconductors & Semiconductor Equipment	3	0.34
5010	Telecommunication Services	29	3.27
	Total	**888**	**100**

Table 4.3 indicates that the sample companies cover a wide range of industry sectors. The industry in which most of the firm-year observations are located is Capital Goods (16.33%), followed by Materials (13.29%) and Retailing (9.68%).[57] Three industries have fewer than 10 observations: Automobiles & Components, Household & Personal Products, and Semiconductors & Semiconductor Equipment.[58]

4.4.3 Correlation of Variables

Table 4.4 presents the pairwise correlation matrix. The industry and year dummy variables are not presented. As can be seen from the table, CETR is significantly positively correlated with FDD (correlation of 0.2854) and SIZE (correlation of 0.1823), and significantly negatively correlated with FOW (correlation of -0.1373), all at the 1% level. These results suggest that the more the franked dividend distributions, the larger the firm size, and the lower the foreign ownership, the higher the CETR (less corporate tax avoidance). FOP is negatively correlated with CETR; however, the correlation is only significant at the 10% level.

Table 4.4: Pairwise Correlation Matrix

	CETR	FDD	FOW	FOP	SIZE
CETR	1.0000				
FDD	0.2854***	1.0000			
FOW	-0.1373***	-0.2123***	1.0000		
FOP	-0.0654*	-0.2576***	0.2910***	1.0000	
SIZE	0.1823***	0.3230***	-0.0422	0.0426	1.0000

CETR is calculated as (current income tax expense + tax adjustment – royalties and resource rent tax) / pre-tax accounting profit before the share of associates' profit or loss. FDD is calculated as (interim dividend × franking percentage + final dividend × franking percentage + special dividend × franking percentage) / (after-tax accounting profit excluding the amount attributable to non-controlling interest). FOW is calculated as the percentage of foreign shareholdings / total percentage of the top 20 shareholdings. FOP is calculated as segment (non-current) assets located in foreign countries / total segment (non-current) assets. SIZE is the natural logarithm of sales revenue.

* indicates statistically significant at the 0.10 level (2-tailed); ** indicates statistically significant at the 0.05 level (2-tailed); *** indicates statistically significant at the 0.01 level (2-tailed).

Among the independent variables of interest and the control variable SIZE, FDD is significantly negatively correlated with FOW (correlation of -0.2123) and FOP

[57] The industry sector Capital Goods includes subsectors such as Construction and Engineering and Building Products. The industry sector Materials includes subsectors such as Metal and Mining. The industry sector Retailing includes subsectors such as Distributors and Multiline Retail.

[58] Excluding the companies in these three industry sectors barely changes the results.

(correlation of -0.2576), and significantly positively correlated with SIZE (correlation of 0.3230). FOW is significantly positively correlated with FOP (correlation of 0.2910). All the above correlations are significant at the 1% level. None of the correlations presented in the table above is higher than 0.33 in absolute values, suggesting that collinearity should not be a concern.

4.4.4 Regression Results[59]

Table 4.5 presents the OLS regression results. To improve the model fit, 26 firm-year observations with standardised residuals greater than 3 in absolute values are excluded, leaving a sample of 862 firm-year observations.[60]

Panel A shows that the overall regression model is statistically significant, since the F-statistic sits at 11.39 and is significant at the 1% level. The adjusted R-square is 0.2318, meaning that the model is capable of explaining 23% of the variations in CETR.

[59] Regression diagnostics are performed to ensure that the underlying assumptions of the OLS regression are met. In Appendix A, a quantile-quantile (Q-Q) plot is presented to check for normal distribution of residuals, a residual versus the fitted value plot is presented to check whether the linearity assumption and the homoscedasticity assumption are met, the Durbin-Watson statistic is calculated to check for autocorrelation, and the variance inflation factors of variables in the model are presented to check for multicollinearity.

[60] Appendix B shows the regression results before excluding observations with standardised residuals greater than 3 in absolute values. The results are similar to the results reported in this section.

Table 4.5: Regression Results

Panel A: Model Summary				
No. of Obs.	R-square	Adj. R-square	F-statistic	Prob. > F
862	0.2541	0.2318	11.39	0.0000
Panel B: Coefficients				
Variables	Coef.	Std. Err.	t	P > |t|
FDD	0.1366882	0.0131616	10.39	0.000
FOW	-0.0473342	0.0234981	-2.01	0.044
FOP	0.0038178	0.0141473	0.27	0.787
SIZE	0.00827	0.0021456	3.85	0.000
Industry 1510	0.0088536	0.0168849	0.52	0.600
Industry 2010	0.0073838	0.0166392	0.44	0.657
Industry 2020	0.0307137	0.018207	1.69	0.092
Industry 2030	0.0143851	0.0241963	0.59	0.552
Industry 2510	0.0099173	0.0408964	0.24	0.808
Industry 2520	0.0561347	0.0214865	2.61	0.009
Industry 2530	0.0007439	0.0199731	0.04	0.970
Industry 2540	0.0329301	0.0229462	1.44	0.152
Industry 2550	0.0332193	0.0183036	1.81	0.070
Industry 3010	-0.0404683	0.0366815	-1.10	0.270
Industry 3020	-0.0392034	0.0231332	-1.69	0.091
Industry 3030	0.0403771	0.0409957	0.98	0.325
Industry 3510	0.0283808	0.020706	1.37	0.171
Industry 3520	-0.0131363	0.0276216	-0.48	0.634
Industry 4510	-0.0246105	0.0187712	-1.31	0.190
Industry 4520	0.0474933	0.0307088	1.55	0.122
Industry 4530	0.0289741	0.0603166	0.48	0.631
Industry 5010	0.0293416	0.0239114	1.23	0.220
Year 2010	-0.0296206	0.0095818	-3.09	0.002
Year 2011	-0.0199538	0.0098808	-2.02	0.044
Year 2012	-0.0299622	0.0098378	-3.05	0.002
Constant	0.0378584	0.0429867	0.88	0.379

CETR is calculated as (current income tax expense + tax adjustment – royalties and resource rent tax) / pre-tax accounting profit before share of associates' profit or loss. FDD is calculated as (interim dividend × franking percentage+ final dividend × franking percentage + special dividend × franking percentage) / after-tax accounting profit excluding the amount attributable to non-controlling interest. FOW is calculated as the percentage of foreign shareholdings / total percentage of the top 20 shareholdings. FOP is calculated as segment (non-current) assets located in foreign countries / total segment (non-current) assets. SIZE is the natural logarithm of sales revenue.

As indicated in Panel B, the coefficient for FDD is 0.1367 (kept to four decimal places) and is significant at the 1% level. This means that, for a unit increase in FDD (from 0 to

1), CETR would increase by 13.67 percentage points. Accordingly, more franked dividend distributions lead to higher CETR hence lower corporate tax avoidance, after controlling for the effects of foreign ownership, foreign operations, firm size, industry affiliations and year-specific characteristics. Thus, this supports Hypothesis 4.1, which predicts a negative (positive) relation between franked dividend distributions and corporate tax avoidance (CETR). The result is also consistent with Ikin and Tran (2013) who show that, when the ratio of ETR (total income tax expense to pre-tax accounting profit) to STR, or the ratio of ETR' (current income tax expense to pre-tax accounting profit) to STR, is regressed on the product of dividend franking percentage and dividend payout ratio (FR*PO), along with other test variables and control variables, the coefficient for FR*PO is 0.163 and 0.301, respectively, and significant at the 1% level.

The coefficient for FOW is -0.0473 and is significant at the 5% level, meaning that a one-unit increase in FOW (from 0% to 100%) is associated with approximately 4.73 percentage points decrease in CETR. If FOW increases by 10 percentage points, on average CETR will reduce by 0.473 percentage points. With a mean CETR of 24%,[61] the decline in tax revenue collection from the sample companies is nearly 2%. This result indicates that, other things being equal, companies with greater foreign ownership exhibit lower CETR. In other words, the higher the proportion of foreign shareholders who cannot claim franking credits as tax offset, the greater the tax avoidance in which the company engages. Therefore, this supports Hypothesis 4.2 which predicts a positive (negative) relation between foreign ownership and corporate tax avoidance (CETR).

The coefficient for FOP is not significantly different from zero (*p*-value of 0.787), suggesting that, after controlling for franked dividend distributions, foreign ownership, firm size, industry affiliation and year-specific characteristics, foreign operations do not play a vital role in determining CETR. The insignificant association between FOP and CETR is consistent with Hypothesis 4.3B (not Hypothesis 4.3A). Companies with foreign operations may avoid foreign taxes by shifting foreign income to Australia and paying Australian corporate income tax which can be passed to shareholders as franking credits. Babcock (2000, p. 16) shows that imputation-based mature multinational companies have strong incentives to shift foreign income home because 'home income is essentially free from corporate tax', and may do so by locating highly profitable activities at home and less profitable activities or activities with highly subjective profit determination abroad.

[61] For the sample of 862 firm-year observations, the mean of CETR is 0.2408859.

The finding discussed above is also consistent with Ikin and Tran (2013) who document an insignificant effect of foreign operations on corporate tax avoidance, although they use the ratio of foreign revenue to total revenue as the proxy for foreign operations.

In terms of the control variables, the coefficient for SIZE is 0.0083 and is significant at the 1% level. This implies that larger companies tend to have slightly higher CETR, and hence engage in less corporate tax avoidance than do their smaller counterparts. The positive firm size effect can be attributed to two factors. First, large companies are subject to greater government scrutiny (such as more frequent tax audits) than are small companies, and thus have incentives to avoid the penalties, regulations and reputational loss caused by the adverse results of government scrutiny (Zimmerman 1983). Second, larger companies are more likely to be mature companies with a substantial number of investors who depend on their franked distributions (such as retirees and superannuation funds), and thus tend to engage less in corporate tax avoidance to maintain a sound franking credit balance to be able to frank their dividends.

The results also indicate the industry affiliation effect. Companies operating in the Commercial & Professional Services (GICS code 2020) and Retailing (GICS code 2550) sectors have CETR higher (marginally significant at the 10% level) than do their counterparts in the Energy sector (base industry, GICS code 1010). Moreover, companies operating in the Consumer Durables & Apparel sector (GICS code 2520) have CETR higher (significant at the 1% level) than those operating in the Energy sector, all else being equal. Meanwhile, companies in the Food, Beverage & Tobacco sector (GICS code 3020) have CETR lower (marginally significant at the 10% level) than do their counterparts in the Energy sector.

With regard to year-specific characteristics, the coefficients for the Year 2010, Year 2011 and Year 2012 dummy variables are negative, significant at the 1%, 5% and 1% levels, respectively. These figures suggest that, on average, the CETR in Year 2009 (the base year) is higher than that in the following three years. This may be because of companies' use of previous tax losses after recovering from the global financial crisis.[62]

[62] For companies that incurred losses during the global financial crisis, it is possible they could not use the tax losses until 2010, 2011 or 2012, when they made sufficient taxable profit. Only companies using prior year tax losses to reduce current tax expense by no more than 5% are included in this study's sample.

4.4.5 Additional Analysis: Interaction Effect

This section provides further analysis on whether franked dividend distributions and foreign ownership interact with each other to shape corporate tax avoidance behaviours in the Australian dividend imputation system. The extent of foreign operations, FOP, is not taken into account because it is found to have no significant influence on CETR, as reported in Section 4.4.4. The original OLS model is extended to include FDD*FOW, which is the interaction between FDD and FOW, as shown in the following equation:

$$\text{CETR} = \alpha + \beta_1\text{FDD} + \beta_2\text{FOW} + \beta_3\text{FDD*FOW} + \beta_4\text{SIZE} + \beta_{5\text{-}22}\text{IND} + \beta_{23\text{-}25}\text{YEAR} + \varepsilon \quad \text{Eq. (4.6)}$$

Table 4.6 reports the regression results of the extended model. To improve the model fit, 26 firm-year observations with standardised residuals greater than 3 in absolute values are excluded, leaving 862 observations in the sample.[63]

Panel A indicates that the overall model is significant, with the F-statistic being 11.57 and significant at the 1% level. The adjusted R-square becomes slightly higher than the original model, sitting at 0.2349. Based on Panel B, it seems that the inclusion of the interaction term results in some changes to that reported for the original model. The coefficient for FDD decreases slightly from 0.1360 to 0.1297, and remains significant at the 1% level. The coefficient for FOW becomes more negative, from -0.0473, significant at the 5% level, to -0.0735, significant at the 1% level. The coefficient for the interaction term, FDD*FOW, is 0.1420 and significant at the 10% level. This means that the higher the foreign ownership of the company, the higher the positive effect of franked dividend distributions on CETR. In other words, when an Australian company with foreign ownership pays more franked dividends to meet the demands of its Australian shareholders, it tends to engage in less corporate tax avoidance, which offsets the negative effect of foreign ownership on CETR, as reflected by the negative coefficient for FOW.

[63] Untabulated regression results before excluding the 26 firm-year observations yield the same conclusions as those reported in this section.

Table 4.6: Regression Results—Extended Model

Panel A: Model Summary				
No. of Obs.	R-square	Adj. R-square	F-statistic	Prob. > F
862	0.2571	0.2349	11.57	0.0000

Panel B: Coefficients				
Variables	Coef.	Std. Err.	t	P > |t|
FDD	0.1297038	0.013281	9.77	0.000
FOW	-0.0734745	0.0272487	-2.70	0.007
FDD*FOW	0.1420422	0.076475	1.86	0.064
SIZE	0.008368	0.0021151	3.96	0.000
Industry 1510	0.0100833	0.0168286	0.60	0.549
Industry 2010	0.0077047	0.0164947	0.47	0.641
Industry 2020	0.0291968	0.0180356	1.62	0.106
Industry 2030	0.0150597	0.0240932	0.63	0.532
Industry 2510	0.0104988	0.0407633	0.26	0.797
Industry 2520	0.0577161	0.0214296	2.69	0.007
Industry 2530	0.0007178	0.0198475	0.04	0.971
Industry 2540	0.0327651	0.0226757	1.44	0.149
Industry 2550	0.0337057	0.018087	1.86	0.063
Industry 3010	-0.0378928	0.0364678	-1.04	0.299
Industry 3020	-0.040001	0.0228884	-1.75	0.081
Industry 3030	0.0424843	0.0409255	1.04	0.300
Industry 3510	0.0290692	0.0206577	1.41	0.160
Industry 3520	-0.0104736	0.0275972	-0.38	0.704
Industry 4510	-0.0234456	0.0187428	-1.25	0.211
Industry 4520	0.0472173	0.0305894	1.54	0.123
Industry 4530	0.0283494	0.0601085	0.47	0.637
Industry 5010	0.0294329	0.0237357	1.24	0.215
Year 2010	-0.0292473	0.0095641	-3.06	0.002
Year 2011	-0.0199171	0.0098594	-2.02	0.044
Year 2012	-0.0286638	0.009832	-2.92	0.004
Constant	0.038366	0.0428465	0.90	0.371

CETR is calculated as (current income tax expense + tax adjustment – royalties and resource rent tax) / pre-tax accounting profit before the share of associates' profit or loss. FDD is calculated as (interim dividend × franking percentage + final dividend × franking percentage + special dividend × franking percentage) / after-tax accounting profit excluding the amount attributable to non-controlling interest. FOW is calculated as the percentage of foreign shareholdings / total percentage of the top 20 shareholdings. FDD*FOW is the product of FDD and FOW. SIZE is the natural logarithm of sales revenue.

4.5 Robustness Checks

Three robustness checks are performed to ensure the robustness of the reported effects of franked dividend distributions, foreign ownership and foreign operations on corporate tax avoidance. First, a robustness check is performed to examine whether the reported results would change if New Zealand is treated as a foreign country. In the main test and additional analysis, FOW and FOP are defined to treat New Zealand shareholders and New Zealand operations as Australian because the Australian and New Zealand governments have extended their dividend imputation systems to include companies residing in the other country. Although the trans-Tasman triangular imputation rules alleviate double taxation on income generated from New Zealand operations by Australian companies, there is still deadweight loss of corporate income tax paid because Australian shareholders cannot claim New Zealand tax as offset, and New Zealand shareholders cannot claim Australian tax as offset. Therefore, it is worth examining whether the negative effect of FOW and insignificant effect of FOP on CETR still hold when New Zealand shareholders and operations are treated as foreign.

Appendix C presents the regression results using the revised foreign ownership measure (FOW-R) and revised foreign operations measure (FOP-R), which treat New Zealand as a foreign country. Generally, the results resemble those reported in Section 4.4.4 (main test, original model), with the coefficient for FOW-R still negative and significant at the 5% level, and the coefficient for FOP-R still insignificantly different from zero. However, it should be noted that FOP-R may underestimate the extent of foreign operations because some companies do not disclose their New Zealand operations separately from Australia operations. Thus, the results in Appendix C should be read with caution.

Second, a number of firm-level control variables employed in prior ETR studies, including profitability, capital intensity, intangible intensity, leverage, growth opportunity, and cash flow constraint, are included in the original regression model (reported in section 4.4.4) as additional control variables. Following Amiram, Bauer and Frank (2013), profitability is measured as the ratio of pre-tax accounting profit before the share of associates' profit or loss to lagged total assets;[64] capital intensity is measured as property, plant, and equipment divided by lagged total assets; intangible intensity is

[64] Attempts are also made to use two alternative profitability measures, namely, the ratio of pre-tax accounting profit before the share of associates' profit or loss to total assets, and the ratio of net operating cash flow to total assets. Results are similar to those reported in Appendix D.

measured as intangible assets divided by lagged total assets; leverage is measured as the ratio of long-term debt to lagged total assets; growth opportunity is measured as lagged book equity divided by lagged market capitalisation; cash flow constraint is calculated as 1 minus the ratio of net operating cash flows to lagged total assets.

Appendix D presents the regression results. After controlling for the above additional firm-level characteristics, FDD is still positively associated with CETR (significant at the 1% level), and FOW is still negatively associated with CETR (significant at the 5% level). The coefficient for FOP is not significantly different from zero. The results are consistent with those reported in section 4.4.4.

Third, a measure of unfranked dividend distributions as a proportion of after-tax profit is included in the regression model to test whether unfranked dividend distributions are negatively related to corporate tax avoidance measured by CETR. Unfranked dividends do not carry franking credits and therefore can be viewed as paid out of corporate profit not subject to Australian tax. It follows that companies distributing unfranked dividends would have stronger incentives to engage in corporate tax avoidance than do companies distributing franked dividends.

Unfranked dividend distributions as a proportion of after-tax profit (UFDD) is measured by dividing the total amount of unfranked interim, final and special dividends for the year by the after-tax profit excluding the amount attributable to non-controlling interest. Appendix E presents the regression results after incorporating UFDD in the model. It is observed that UFDD is not significantly related to CETR, while the coefficient for FDD increases slightly and is still significant at the 1% level. The insignificant relation between UFDD and CETR suggests that unfranked dividend distributions may not be one of the corporate tax avoidance determinants. Untabulated descriptive statistics show that UFDD has a mean and median value of 0.0442 and 0, respectively. In fact, 756 of the 862 firm-year observations have zero UFDD. It is possible that the found insignificant relationship between UFDD and CETR is partially because of the small number of observations distributing unfranked dividends.

4.6 Limitations

The research design is subject to three main limitations. First, this study focuses on the corporate tax avoidance of profitable Australian listed companies only, so the results may not be generalisable to loss-making listed companies. The corporate tax avoidance of loss-

making listed companies (mainly small and start-up companies) is largely overlooked in the literature, as their ETRs would be difficult to interpret because of a non-positive numerator and/or denominator. Second, the foreign ownership measure in this study is not precise. Despite the significant efforts made to verify the nationalities of the top 20 shareholders, the nationalities of some shareholders remain unknown. Third, the potential endogeneity among the dependent variables and test variables cannot be ruled out, because the variables reflect management decisions which are likely to be inter-related. Additional analyses (not reported), including panel data analyses using fixed effects model, random-effects model, and robust standard error and firm-clustered standard error analyses, have been performed. The results indicate that omitted control variables representing firm-level characteristics do not cause significant bias to the regression coefficients of the test variables, and the reported standard errors are robust. Nevertheless, the possible impact of endogeneity cannot be excluded entirely and the results must be interpreted with respect to this limitation.

4.7 Summary and Conclusion

This chapter investigates the corporate tax avoidance-reducing effect of the Australian dividend imputation system on profit-making listed companies. Based on the data of Australian listed companies for the years 2009 to 2012, this chapter finds that companies distributing more franked dividends have higher CETR which indicates less corporate tax avoidance. Franked dividend distributions allow companies to pass their corporate income tax to shareholders as franking credits, which reduce shareholders' tax liabilities. Thus, corporate income tax becomes only a pre-payment of shareholders' tax and does not lower shareholders' after-tax returns. As such, companies distributing franked dividends may not have strong incentives to engage in costly corporate tax avoidance arrangements.

This chapter also observes that companies with greater foreign ownership have lower CETR hence greater tax avoidance. Foreign shareholders cannot claim the franking credits as tax offset in their home countries. Thus, Australian corporate income tax reduces their after-tax returns and needs to be avoided to enhance their after-tax wealth. Chapter 6 attempts to answer the question regarding how Australian companies with substantial foreign ownership avoid Australian tax.

This chapter finds no significant relationship between foreign operations and CETR. It is possible that companies with foreign operations shift their foreign profits back to

Australia (inward profit shifting) so that a greater proportion of their worldwide profit is subject to Australian tax which can be passed to shareholders as franking credits. Chapter 5 provides stronger evidence to support this conjecture.

The additional analysis demonstrates a positive relationship between CETR and the interaction between franked dividend distributions and foreign ownership. This indicates that, when an Australian company with foreign ownership pays more franked dividends to meet the demands of its Australian shareholders, it tends to engage in less corporate tax avoidance.

This chapter provides empirical evidence on the corporate tax avoidance-reducing effect of the Australian dividend imputation system. Given that the majority of profitable Australian listed companies have predominantly domestic ownership and distribute franked dividends, the findings help explain why corporate tax avoidance is not prevalent among Australian listed companies. Along with Ikin and Tran (2013) and Amiram, Bauer and Frank (2013), the results from this chapter suggest that countries that do not adopt a dividend imputation system may consider adopting such a system as part of the solutions to the corporate tax avoidance problem.

Chapter 5: Cross-border Profit Shifting—The Australian Case

5.1 Introduction

This chapter addresses the second research question raised in Chapter 1:

Do Australian companies with foreign operations engage in cross-border profit shifting for tax avoidance? If so, what is the effect of the profit shifting on their overall tax liabilities?

Chapter 4 finds that Australian listed companies with more extensive foreign operations do not engage in greater corporate tax avoidance than do companies with less extensive foreign operations. Although this finding is consistent with those in other Australian studies, such as those by Davidson and Heaney (2012) and Ikin and Tran (2013), it is inconsistent with U.S. and European studies which show that MNEs take advantage of the tax rate differences across countries and shift their global profits to low-tax countries or jurisdictions to avoid tax.[65]

The observed different relationships between foreign operations and corporate tax avoidance may be attributable to the different ways that dividends and foreign profits are taxed in different countries. In particular, Australia operates a full dividend imputation system, in which Australian corporate income tax payments can be passed to Australian shareholders in the form of franking credits attached to dividends. As discussed and demonstrated in Chapter 4, this mechanism reduces companies' incentives to avoid Australian tax. Moreover, Australia adopts a territorial approach to tax 'active' business profits from foreign subsidiaries and branches (hereafter 'territorial system'), which effectively exempts foreign profits from home country income tax in most cases. This means that the consolidated group, consisting of the Australian parent company and its foreign subsidiaries, is liable to pay foreign taxes (without additional Australian tax) on the foreign profits. With the full dividend imputation system coupled with the territorial approach to tax foreign profits, Australian companies may have incentives to shift their foreign profits back to Australia (inward profit shifting) to make them subject to

[65] For simplicity, countries, jurisdictions and special regions are aggregately referred to as countries.

Australian tax, even at the expense of foregoing the apparent benefits of lower tax rates in foreign countries.

Most of the major economies in the world do not operate a full dividend imputation system combined with a territorial system. For instance, the U.S. adopts the classical system along with a worldwide approach to tax foreign profits (hereafter 'worldwide system'). In its worldwide tax system, if foreign profits are repatriated to the U.S. in the form of dividend payments, they are subject to income tax in the U.S., although a foreign tax credit can be claimed to mitigate the double taxation on foreign profits.[66] Most developed European countries—such as Germany, France and Switzerland—although adopting a territorial system similar to Australia, do not operate a dividend imputation system.[67] Instead, they follow the partial shareholder relief tax systems, where shareholders pay personal income tax on dividend income, yet receive tax credits for part of the corporate income tax paid on the underlying profit. Some European countries, including the U.K., Ireland, Germany, Italy, Finland, France and Norway, had adopted full or partial imputation systems in the past, yet abolished their imputation systems between 1999 and 2006, following the adverse rulings from the European Court of Justice on the grounds that dividend imputation systems treat domestic and foreign shareholders differently, and are not consistent with the rules on free movement within the EU (Harris 2010).

This chapter is a further exploration of the relationship between foreign operations and corporate tax avoidance in the Australian dividend imputation, based on the findings in the previous chapter. It examines the cross-border profit shifting behaviour of Australian MNEs, which is expected to be different from MNEs in other major economies because of Australia's full dividend imputation system and territorial system.

Consistent with the theoretical framework developed by Babcock (2000), which describes how imputation-based territorial MNEs (MNEs operating in countries adopting both the dividend imputation system and territorial system, such as Australian MNEs) change their

[66] For example, when the foreign tax rate is lower than the home country tax rate, the amount of home country tax levied on the foreign profit is essentially the difference between the tax liability on the profit as if the profit were sourced in the home country, and the amount of the foreign tax paid.

[67] The U.K. and a few major Asian economies follow a worldwide system with slight variations from the U.S. worldwide system. In reality, neither the worldwide tax system nor the territorial tax system is adopted in their pure forms. As suggested by Fleming, Peroni and Shay (2008), the two tax systems should be labelled 'hybrid' in their names. For a comprehensive review of the two tax systems, see Fleming, Peroni and Shay (2008).

investment incentives as their foreign operations mature, this chapter argues that Australian MNEs have incentives to shift foreign profits to Australia to circumvent the statutory limitation on franking credits, thereby enjoying greater tax benefits provided by the imputation system. As a result of foreign profits being shifted inwards and subsequently taxed in Australia, Australian MNEs are expected to have similar tax liabilities to their domestic-operating counterparts.

This study draws a sub-sample of the firm-year observations employed in Chapter 4 for further investigation. Specifically, only observations without foreign shareholders among the top 20 shareholders (FOW of 0) are retained. This is undertaken to ensure that the results found in this study are not confounded by foreign ownership, as foreign ownership is shown to be negatively (positively) associated with CETR (corporate tax avoidance) in Chapter 4.

With regard to the variables, following the discussion in Chapter 4, CETR is employed as the corporate tax avoidance or tax liability measure for Australian listed companies. CETR is defined as current income tax expense, excluding adjustment for the previous year(s), and including adjustment for the current year (as reported in the subsequent year), divided by pre-tax accounting profit before the share of associates' profit or loss. Instead of using the foreign operations measure developed in Chapter 4 (FOP), this study employs two foreign subsidiary location indicators to distinguish companies with subsidiaries in countries with low corporate tax rates (defined as not higher than 20%) and companies with subsidiaries in countries with high corporate tax rates (defined as not lower than 35%).

The OLS regression results show that companies with subsidiaries located in low-tax countries, high-tax countries, or both do not have tax liabilities significantly different from those companies without such subsidiaries. This finding provides further evidence to support the conjecture that, to maximise the tax benefits provided by the dividend imputation system, Australian companies shift foreign profits back to Australia, rather than to low-tax countries.

The remainder of this chapter is organised as follows. Section 5.2 reviews the relevant literature on how different arrangements of dividend taxation and foreign profit taxation shape MNEs' cross-border profit shifting behaviour. Hypotheses are developed accordingly. Section 5.3 presents the research design. Section 5.4 discusses the sample

and regression results. Section 5.5 presents the robustness checks. Section 5.6 discusses the limitations of the research. Finally, Section 5.7 summarises and concludes the chapter.

5.2 Literature Review and Hypotheses Development

5.2.1 Cross-border Profit Shifting by Non-imputation- versus Imputation-based MNEs

Prior studies on MNEs' cross-border profit shifting are conducted mainly in the U.S. which has never adopted a dividend imputation system, and European countries, some of which had adopted dividend imputation, yet subsequently abolished it. A common finding in these studies is that MNEs take advantage of the tax rate arbitrage across countries by shifting their worldwide profits to low-tax countries. Back in the early 1990s, two influential papers by Grubert and Mutti (1991) and Hines and Rice (1994) rely on aggregate (country-level) data and find that U.S. MNEs' subsidiaries operating in low-tax countries or tax havens have a disproportionally larger amount of income, greater allocation of real capital, and greater amount of exports to and imports from U.S.-related parties.

Recent research using firm-level financial data and intra-group trade data provide more direct evidence on U.S. and European MNEs' cross-border profit shifting for tax avoidance. For example, Dischinger (2007) undertakes an econometric panel study based on the firm-level data of European subsidiaries of MNEs. It is documented that a subsidiary's pre-tax profit is negatively associated with the tax rate difference between the foreign host country (where the subsidiary is operating) and the home country (where the MNE is domiciled). Clausing (2003) employs monthly intra-firm trade prices (both export and import) of MNEs with either subsidiaries or parent companies located in the U.S.. She indicates that, when the tax rate of a foreign country decreases, the U.S. intra-firm export prices become lower and U.S. intra-firm import prices become higher, relative to those of non-intra-firm trade transactions. These findings are consistent with tax-motivated cross-border profit shifting.

Studies examining imputation-based (mainly Australian) MNEs' cross-border profit shifting are sparse and document inconsistent results regarding the effect of foreign operations on corporate tax avoidance. For example, Ikin and Tran (2013) demonstrate that the extent of a company's foreign operations—as measured by the ratio of foreign

revenue to total revenue—does not have significant influence on the company's tax avoidance.

Taylor and Richardson (2012) investigate the international corporate tax avoidance of the top 300 Australian listed companies. They demonstrate that these companies engage in thin capitalisation, transfer pricing and income shifting, and use multinationality and tax havens for tax avoidance purposes. Nevertheless, it should be noted that the measures of the tax avoidance channels in their study do not indicate the direction of profit shifting (such as whether or not the profit is shifted to low-tax countries). Consider the transfer pricing measure as an example.[68] In Taylor and Richardson (2012), it is an index constructed based on the sum of eight transfer pricing indicators, divided by eight. The eight indicators include the existence of interest free loans, existence of debt forgiveness, existence of impaired loans between related parties, and provision of non-monetary considerations without commercial justification, just to name a few. Thus, a higher index can only imply greater transfer pricing activities, but not the direction of the profit shifting. Moreover, the extent of companies' multinational operations in Taylor and Richardson (2012) is measured by the proportion of total foreign-sourced income in total income. Consistent with Ikin and Tran (2013), Taylor and Richardson (2012) do not document a consistently significant relationship between multinational operations and corporate tax avoidance across models with different corporate tax avoidance measures.

The findings in these two studies suggest that Australian MNEs may indeed engage in cross-border profit shifting. However, the direction of the shifting and the influence of the shifting on the overall corporate tax liability may be different from those of non-imputation-based MNEs.

5.2.2 Cross-border Profit Shifting by Worldwide- versus Territorial-based MNEs

MNEs in countries with the worldwide system to tax foreign profits (hereafter 'worldwide-based MNEs') may have different degrees of cross-border profit shifting than do MNEs in countries with the territorial system (hereafter 'territorial-based MNEs'). On the surface, it appears that, because of the additional home country tax payable upon foreign profits repatriation in the worldwide system, territorial-based MNEs may enjoy

[68] Transfer pricing refers to the prices charged on the flow of goods and services between members of an MNE that operate in different countries with different tax rates. It is typically used to shift profit across countries where the MNE operates. Chapter 6 further investigates tax avoidance via transfer pricing arrangements.

greater tax savings than worldwide-based MNEs, especially in the long term, by shifting profits to low-tax countries. However, the tax savings difference in the two systems as a result of profit shifting may be blurred because of the deferral provision and cross-crediting allowed in the (U.S.) worldwide system. Specifically, the additional home country tax on profits generated in low-tax countries can be indefinitely deferred if the foreign profits are reinvested in foreign operations (deferral provision), or can be reduced by the amount of the excess tax paid on profits generated in high-tax countries (cross-crediting). Thus, whether or not territorial-based MNEs have greater incentives than worldwide-based MNEs to engage in tax avoidance is an empirical question.

Markle (2016) compares the tax-induced profit shifting behaviour of worldwide- and territorial-based MNEs. He finds that, on average, territorial-based MNEs engage in greater profit shifting than do worldwide-based MNEs with the same tax avoidance incentives and opportunities. After parsing profit shifting into that among foreign subsidiaries and that involving the parent companies, Markle (2016) shows that territorial-based MNEs engage in greater profit shifting involving parent companies, yet similar levels of profit shifting among foreign subsidiaries, in comparison with worldwide-based MNEs. This finding indicates that, although the deferral provision and cross-crediting may provide conditions for convergence of the tax savings arising from profit shifting under the two systems, such conditions are not always present. Moreover, Markle (2016) also documents that territorial-based MNEs' tax-induced profit shifting is not affected by reinvestment opportunities in the foreign country that receives the shifted profit, while that of worldwide-based MNEs is. This is consistent with the profit shifting model of U.S. MNEs developed by Klassen, Laplante, and Carnaghan (2014), which predicts that, because home country tax on foreign profits can only be deferred, yet not avoided permanently under the worldwide system, profit shifting to low-tax countries would decrease when the required rate of return on the foreign investment increases.

Atwood et al. (2012) examine the effect of home country tax system characteristics on corporate tax avoidance across countries. They find that, after controlling for firm-specific characteristics including performance, size, operating costs, leverage, growth, the presence of multinational operations, and industry, territorial-based MNEs engage in greater tax avoidance than do worldwide-based MNEs.

Based on the findings of prior studies, it seems conclusive that territorial-based MNEs engage in greater cross-border profit shifting for tax avoidance than do their counterparts

operating in a worldwide system. Nevertheless, the effect of dividend taxation on the cross-border profit shifting of MNEs in the territorial and worldwide systems is largely overlooked.

5.2.3 Cross-border Profit Shifting by Imputation-based Territorial MNEs: The Australian Case

Australia has been adopting a full dividend imputation system since 1987, and has gradually changed from a worldwide system to a territorial system in relation to 'active' business income from foreign operations by Australian resident companies, following the Ralph Review and the Review of International Taxation in 2002 (The Treasury 2013). Thus, the country provides a natural setting to examine the combined effect of dividend imputation and territorial systems on MNEs' cross-border profit shifting.

This study argues that, because of the full dividend imputation system and territorial approach to tax 'active' foreign business income, Australian MNEs engage in tax-motivated cross-border profit shifting in a distinctive manner. Specifically, to circumvent the statutory limitation on franking credits (only Australian income tax can be attached to dividends as franking credits) and subsequently enjoy greater tax benefits from the imputation system, Australian MNEs have incentives to shift foreign profits to Australia. By doing so, a larger proportion of the company's worldwide profits are subject to Australian tax which can be subsequently 'refunded' to resident shareholders via franked dividend distributions. This direction of profit shifting should hold, regardless of whether the MNE has operations in foreign low-tax countries (including tax havens) or high-tax countries. This means that Australian MNEs would be willing to forego the apparent benefits of a lower tax rate in a foreign country and shift profits to Australia to maximise the imputation benefits. As a result of the inward profit shifting, they would have similar tax liabilities to those without subsidiaries in foreign low- or high-tax countries. This leads to the following two hypotheses:

Hypothesis 5.1: Ceteris paribus, companies with subsidiaries incorporated in low-tax countries (countries with STR not higher than 20%) have similar tax liabilities compared to companies without such subsidiaries.

Hypothesis 5.2: Ceteris paribus, companies with subsidiaries incorporated in high-tax countries (countries with STR not lower than 35%) have similar tax liabilities compared to companies without such subsidiaries.

5.3 Research Design

5.3.1 Regression Model

The following OLS regression model is employed to test the hypotheses developed in Section 5.2.

$$\text{CETR} = \alpha + \beta_1 \text{LOW} + \beta_2 \text{HIGH} + \beta_3 \text{FDD} + \beta_4 \text{SIZE} + \beta_{5\text{-}22} \text{IND} + \beta_{23\text{-}25} \text{YEAR} + \varepsilon$$

Eq. (5.1)

where:

- CETR: current effective tax rate—the corporate tax liability measure
- LOW: an indicator for firm-year observations with at least one subsidiary incorporated in a low-tax country (with STR not higher than 20%)
- HIGH: an indicator for firm-year observations with at least one subsidiary incorporated in a high-tax country (with STR not lower than of 35%)
- FDD: franked dividend distributions
- SIZE: firm size
- IND: industry dummy variables[69]
- YEAR: year dummy variables[70]
- ε: the regression error term.

Based on the hypotheses developed in Section 5.2, the coefficients for LOW and HIGH are expected to be insignificantly different from zero. The definitions for each of the variables in the above regression model are explained below.

[69] There are 19 industries in total where the sample companies operate. Thus, 18 industry dummy variables are created. The base industry is Energy, with a GICS code of 1010.

[70] There are four years across the sample period. Therefore, three year dummy variables are created. The base year is 2009.

5.3.2 Variables in the Regression Model

Dependent variable: CETR

Chapter 4 develops a corporate tax avoidance measure, CETR. In this study, the same CETR is used as the corporate tax liability measure. The definition of CETR is reproduced below in Equation (5.2):

$$\text{CETR} = \frac{\text{Current income tax expense + Tax adjustment − Royalties and resource rent tax}}{\text{Pre-tax accounting profit before the share of associates' profit or loss}}$$

Eq. (5.2)

The item 'current income tax expense' does not include adjustment made to the current tax expense of previous year(s). The item 'tax adjustment' refers to adjustment to the current year's current income tax expense, which is reported in the subsequent year's annual report. Discontinued operations are taken into account when calculating both the denominator and numerator, as they contribute to the overall profitability hence tax liability of the company.

Independent variables of interest: LOW and HIGH

The information disclosed by Australian listed companies in their annual reports (notes to financial statements) enables the identification of the specific foreign countries in which the subsidiaries are incorporated.[71] The corporate tax rates of each of the foreign countries are sourced from KPMG (2016). Some countries changed their corporate tax rates during the sample period from 2009 to 2012. This study employs the corporate tax rate applicable to the particular year.

(1) Low-tax country subsidiary indicator (LOW)

The indicator, LOW, takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in a low-tax country (hereafter 'low-tax subsidiary'), and 0 otherwise. Low-tax countries are those with STR not higher than 20% in the particular year. In defining 'low tax', given that the Australian STR is 30%, this study employs 20% (rather than 25%) as the threshold because corporate ETRs are typically a few percentage points lower than the STR because of the differences between tax rules and accounting

[71] However, companies do not disclose the scales of operations in the foreign countries.

standards (such as accelerated depreciation allowed under the tax law, and the R&D tax concession). Moreover, from the descriptive statistics provided in Table 4.2 in Chapter 4, the mean CETR is around 25.31%, which renders a foreign corporate tax rate of 25% not really a 'low' rate. Therefore, a cut-off point of 20% is chosen to ensure that the foreign country has an STR significantly below the Australian corporate tax rate, both statutory and effective.

It should be noted that low-tax countries, as defined above, also include tax havens. Tax havens are defined as 'low-tax jurisdictions that provide investors opportunities for tax avoidance' (Desai, Foley & Hines 2006, p. 514) or, according to the OECD, jurisdictions that:

> impose no taxes or nominal corporate taxes, have laws or administrative practices which prevent the effective exchange of information between tax authorities and lack transparency on financial and tax arrangements including regulatory, legal, and administrative provisions and access to financial records (Taylor & Richardson 2012, p. 476).

Examples of common low-tax countries include Chile, Luxembourg, Poland, Romania, Singapore, Ireland and Hong Kong, just to name a few.

(2) High-tax country subsidiary indicator (HIGH)

The indicator, HIGH, takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in a high-tax country (hereafter 'high-tax subsidiary'), and 0 otherwise. High-tax countries are those with STR not lower than 35% in the particular year. The cut-off point of 35% is chosen to ensure that the foreign country has an STR significantly higher than the Australian corporate tax rate, both statutory and effective. Japan and the U.S. are two examples of high-tax countries.

Control variables: FDD, SIZE, IND and YEAR[72]

(1) Franked dividend distributions (FDD)

[72] In the Robustness Checks section, analyses are performed to incorporate additional control variables including profitability, capital intensity, intangible intensity, leverage, growth opportunity, and cash flow constraint. The results are presented in Appendix I.

The franked dividend distributions measure, FDD, is employed as the control variable in this study. It is defined and calculated in the same manner as that in Chapter 4. The specific calculation is reproduced in the equation below:

$$\text{FDD} = \frac{\text{Interim dividend} \times \text{Franking percentage} + \text{Final dividend} \times \text{Franking percentage} + \text{Special dividend} \times \text{Franking percentage}}{\text{After-tax accounting profit excluding the amount attributable to non-controlling interest}} \qquad \text{Eq. (5.3)}$$

The dividends in the above equation are the dividends declared for the year.

(2) Firm size (SIZE)

Firm size is measured in the same way as in Chapter 4: natural logarithm of sales revenue. It is included as a control variable because prior studies have found a strong association between firm size and various ETR measures (e.g. Davidson & Heaney 2012; Richardson & Lanis 2008; Tran & Yu 2008).

(3) Industry dummy variables (IND)

Industry dummy variables are created based on the four-digit GICS codes obtained from DatAnalysis Premium. They are included to control for industry affiliation effect.

(4) Year dummy variables (YEAR)

Year dummy variables are included to control for year-specific characteristics that may result in either increased or decreased CETR for a particular year.

5.4 Sample and Regression Results

5.4.1 Sample

The sample selection process starts with the 888 firm-year observations employed in Chapter 4, which are the companies listed on the ASX, as obtained from the DatAnalysis Premium database across the period 2009 to 2012, after excluding foreign incorporated companies listed on the ASX, financial companies, trust funds, stapled securities, utilities companies, dual-listed companies, firm-year observations with non-positive pre-tax accounting profit before the share of associates' profit or loss, firm-year observations with non-positive income tax expense, firm-year observations with incomplete data or only half-year data, firm-year observations with CETR or dividend payout ratio greater than 1

or less than 0, and firm-year observations with CETR significantly affected by the use of tax losses or changes in tax rates or tax laws.

Firm-year observations with foreign shareholders among the top 20 shareholders (FOW greater than 0) are excluded to ensure that any relationship between foreign subsidiary locations and CETR found in this study is not confounded by foreign ownership, as foreign ownership is shown to be negatively (positively) associated with CETR (corporate tax avoidance) in Chapter 4. The exclusion reduces the sample to 680 firm-year observations across the four-year study period. Table 5.1 presents the sample reconciliation.

Table 5.1: Sample Reconciliation

	2009	2010	2011	2012	Total
Companies listed on Australian Securities Exchange (ASX) as obtained from DatAnalysis Premium database*	1958	2030	1769	2027	7784
Less foreign incorporated companies listed on ASX	59	79	50	95	283
Less financial companies, trust funds, and stapled securities	264	264	259	288	1075
Less utilities companies	33	33	25	27	118
Less dual-listed companies	2	2	2	2	8
Less firm-year observations with non-positive pre-tax accounting profit before the share of associates' profit or loss	1161	1149	1021	1164	4495
Less firm-year observations with non-positive income tax expense	94	129	92	90	405
Less firm-year observations with incomplete data or only half-year data	20	21	18	32	91
Less firm-year observations with CETR greater than 1 or less than 0	28	31	30	32	121
Less firm-year observations with a dividend payout ratio greater than 1 or less than 0	22	34	26	31	113
Less firm-year observations with CETR significantly affected by utilisation of tax losses	45	38	30	37	150
Less firm-year observations with CETR significantly affected by changes in tax rates or tax laws	0	18	5	14	37
Base sample from Chapter 4	**230**	**232**	**211**	**215**	**888**
Less firm-year observations with non-zero foreign ownership (FOW)	41	66	49	52	208
Total for regression analyses	**189**	**166**	**162**	**163**	**680**

* DatAnalysis Premium database includes companies listed on the Australian Securities Exchanges (ASX) and New Zealand Exchange (NZX). Companies listed on the NZX are first excluded.

5.4.2 Descriptive Statistics

Table 5.2 summarises the descriptive statistics for CETR, FDD and SIZE. Table 5.3 presents the frequencies of industry and subsidiary locations categorised into low- and high-tax countries. For simplicity, the sample employed in this chapter is referred to as the sub-sample when compared with the sample employed in Chapter 4, which includes firm-year observations with non-zero FOW (referred to as the full sample).

The mean and median values of CETR in the sub-sample are 0.2605 and 0.2763, respectively, both of which are slightly higher than those reported in Table 4.2 in Chapter 4 for the full sample (the mean and median values are 0.2526 and 0.2712, respectively). The standard deviation is 0.1238 for the sub-sample—lower than that for the full sample (0.1363). Moreover, CETR for the sub-sample ranges from 0 to 0.8727, which is narrower than that in the full sample (0 to 0.9838). These figures suggest that, in comparison with the CETR reported for the full sample, the CETR for the sub-sample is closer to the STR of 0.3 and contains fewer variations.

Similarly, FDD has mean and median values slightly higher than those reported for the full sample (0.4426 and 0.4930, respectively, versus 0.3990 and 0.4485, respectively), which indicates that, on average, the firm-year observations without foreign ownership among the top 20 shareholders distribute more franked dividends than do the observations with foreign ownership.

Table 5.2: Descriptive Statistics

Variables	Mean	Median	Std. Dev.	Min.	Max.	Skewness	Kurtosis
CETR	0.2605	0.2763	0.1238	0	0.8727	0.2478	5.2338
FDD	0.4426	0.4930	0.3070	0	0.9959	-0.1516	1.7977
SIZE	19.0901	18.9493	1.8176	11.4721	24.7783	0.1802	3.7823

CETR is calculated as (current income tax expense + tax adjustment – royalties and resource rent tax) / pre-tax accounting profit before the share of associates' profit or loss. FDD is calculated as (interim dividend × franking percentage + final dividend × franking percentage + special dividend × franking percentage) / after-tax accounting profit excluding the amount attributable to non-controlling interest. SIZE is the natural logarithm of sales revenue.

The firm size measure, SIZE, has a mean value of 19.0901 and a median value of 18.9493 for the sub-sample, similar to those reported for the full sample (18.9670 and 18.8101, respectively). Moreover, the range of SIZE for the sub-sample is the same as that for the full sample, from 11.4721 to 24.7783.

From Table 5.3, it can be seen that the sample companies cover a wide range of industry sectors. Similar to the full sample employed in Chapter 4, in the sub-sample, the industry in which most of the firm-year observations are located is Capital Goods (19.41%), followed by Retailing (11.91%) and Commercial & Professional Services (10.15%).[73] The three industries with fewer than 10 observations are Automobiles & Components, Household & Personal Products, and Semiconductors & Semiconductor Equipment.[74]

Table 5.3 also indicates that there are 246 firm-year observations with subsidiaries incorporated in low-tax countries, which is expected, given the relatively high corporate tax rate in Australia. In addition, 191 firm-year observations have subsidiaries incorporated in high-tax countries, such as the U.S. and Japan, which is also expected, since the two high-tax countries are essential trading partners of Australia.

[73] The industry sector Capital Goods includes subsectors such as Construction and Engineering and Building Products. The industry sector Retailing includes subsectors such as Distributors and Multiline Retail. The industry sector Commercial & Professional Services includes subsectors such as Office Services & Supplies and Research & Consulting Services.

[74] Excluding the companies in these three industry sectors barely changes the results.

Table 5.3: Frequency of Industry and Subsidiary Locations

Industry (Four-digit GICS codes)	Industry	Frequency	Percentage of Firm-year Obs.
1010	Energy	39	5.74
1510	Materials	68	10
2010	Capital Goods	132	19.41
2020	Commercial & Professional Services	69	10.15
2030	Transportation	21	3.09
2510	Automobiles & Components	7	1.03
2520	Consumer Durables & Apparel	25	3.68
2530	Consumer Services	37	5.44
2540	Media	23	3.38
2550	Retailing	81	11.91
3010	Food & Staples Retailing	10	1.47
3020	Food, Beverage & Tobacco	23	3.38
3030	Household & Personal Products	6	0.88
3510	Health Care Equipment & Services	34	5
3520	Pharmaceuticals, Biotechnology & Life Sciences	10	1.47
4510	Software & Services	55	8.09
4520	Technology Hardware & Equipment	10	1.47
4530	Semiconductors & Semiconductor Equipment	3	0.44
5010	Telecommunication Services	27	3.97
		680	**100**
Subsidiary Locations			
Low-tax foreign countries		246	36.18
High-tax foreign countries		191	28.09

5.4.3 Correlation of Variables

Table 5.4 reports the pairwise correlation matrix among CETR, LOW, HIGH, FDD and SIZE.

Table 5.4: Pairwise Correlation Matrix

	CETR	LOW	HIGH	FDD	SIZE
CETR	1.0000				
LOW	0.1043***	1.0000			
HIGH	0.0454	0.3739***	1.0000		
FDD	0.2543***	0.0453	-0.0876**	1.0000	
SIZE	0.1357***	0.3421***	0.1527***	0.2862***	1.0000

CETR is calculated as (current income tax expense + tax adjustment – royalties and resource rent tax) / pre-tax accounting profit before the share of associates' profit or loss. LOW is a low-tax country subsidiary indicator which takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in a foreign country with STR not higher than 20% in the particular year, or 0 otherwise. HIGH is a high-tax country subsidiary indicator which takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in a foreign country with STR not lower than 35% in the particular year, or 0 otherwise. FDD is calculated as (interim dividend × franking percentage + final dividend × franking percentage + special dividend × franking percentage) / after-tax accounting profit excluding the amount attributable to non-controlling interest. SIZE is the natural logarithm of sales revenue.

* indicates statistically significant at the 0.10 level (2-tailed); ** indicates statistically significant at the 0.05 level (2-tailed); *** indicates statistically significant at the 0.01 level (2-tailed).

Among the two foreign subsidiary location indicators, LOW is positively correlated with CETR at the 1% level (correlation of 0.1043), while HIGH is not significantly correlated with CETR, providing some preliminary evidence that having foreign subsidiaries does not reduce the overall corporate tax liabilities, regardless of the foreign tax rates. Moreover, the two subsidiary location indicators are positively correlated with each other at the 1% level (correlation of 0.3739), suggesting that a company with subsidiaries incorporated in low-tax countries is likely to have subsidiaries incorporated in high-tax countries, and vice versa.

The franked dividend distributions measure, FDD, is positively correlated with CETR at the 1% level (correlation of 0.2543), indicating that companies distributing more franked dividends are more likely to have higher CETR. FDD is not significantly correlated with LOW, suggesting that having subsidiaries incorporated in low-tax countries may not impede the company's franked dividend distributions. However, FDD is negatively correlated with HIGH at the 5% level (correlation of -0.0876), meaning that having subsidiaries incorporated in high-tax countries may reduce franked dividend distributions.

The firm size measure, SIZE, is strongly positively correlated with all other variables presented in Table 5.4 at the 1% level. This implies that large companies tend to have relatively high CETR, subsidiaries in low-tax and/or high-tax countries, and a relatively high level of franked dividend distributions.

5.4.4 Regression Results[75]

Table 5.5 presents the OLS regression results. Firm-year observations with standardised residuals greater than 3 in absolute values are further excluded to improve the model fit, leaving 664 firm-year observations in the sample.[76] Panel A shows that the adjusted R-square is 0.1549, suggesting that the model can explain approximately 15.49% of the variations in CETR. A lower than 20% adjusted R-square is not uncommon in ETR studies, such as the studies by Higgins, Omer and Phillips (2015) and Tran and Yu (2008). The F-statistic of 5.86, significant at the 1% level, suggests that the overall model statistically significant.

[75] Regression diagnostics are performed to ensure that the underlying assumptions of the OLS regression are met. In Appendix F, a quantile-quantile (Q-Q) plot is presented to check for normal distribution of residuals, a residual versus the fitted value plot is presented to check whether the linearity assumption and the homoscedasticity assumption are met, the Durbin-Watson statistic is calculated to check for autocorrelation, and the variance inflation factors of variables in the model is presented to check for multicollinearity.

[76] Appendix G shows the regression results before excluding observations with standardised residuals greater than 3 in absolute values, which are similar to the results reported in this section.

Table 5.5: Regression Results

Panel A: Model Summary				
No. of Obs.	R-square	Adj. R-square	F-statistic	Prob. > F
664	0.1868	0.1549	5.86	0.0000
Panel B: Coefficients				
Variables	Coef.	Std. Err.	t	P > |t|
LOW	0.0132497	0.0096277	1.38	0.169
HIGH	0.0027884	0.0099409	0.28	0.779
FDD	0.122574	0.014722	8.33	0.000
SIZE	0.0037804	0.0026087	1.45	0.148
Industry 1510	0.0084914	0.0207939	0.41	0.683
Industry 2010	0.0064002	0.0190409	0.34	0.737
Industry 2020	0.0114988	0.0207111	0.56	0.579
Industry 2030	0.0080318	0.0279115	0.29	0.774
Industry 2510	0.0055062	0.0415202	0.13	0.895
Industry 2520	0.0384918	0.0263896	1.46	0.145
Industry 2530	-0.0044145	0.0238154	-0.19	0.853
Industry 2540	0.0267708	0.0270758	0.99	0.323
Industry 2550	0.0343835	0.020607	1.67	0.096
Industry 3010	-0.0162218	0.0382384	-0.42	0.672
Industry 3020	-0.0308525	0.0270746	-1.14	0.255
Industry 3030	0.042474	0.0446261	0.95	0.342
Industry 3510	0.0275513	0.0238776	1.15	0.249
Industry 3520	-0.0101496	0.0356665	-0.28	0.776
Industry 4510	-0.013991	0.0222817	-0.63	0.530
Industry 4520	0.0289777	0.0362811	0.80	0.425
Industry 4530	0.0136235	0.0607152	0.22	0.823
Industry 5010	0.0223227	0.0258039	0.87	0.387
Year 2010	-0.0322344	0.010794	-2.99	0.003
Year 2011	-0.0196923	0.0109924	-1.79	0.074
Year 2012	-0.0332953	0.0109467	-3.04	0.002
Constant	0.1287271	0.0512645	2.51	0.012

CETR is calculated as (current income tax expense + tax adjustment – royalties and resource rent tax) / pre-tax accounting profit before the share of associates' profit or loss. LOW is a low-tax country subsidiary indicator which takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in a foreign country with STR not higher than 20% in the particular year, or 0 otherwise. HIGH is a high-tax country subsidiary indicator which takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in a foreign country with STR not lower than 35% in the particular year, or 0 otherwise. FDD is calculated as (interim dividend × franking percentage + final dividend × franking percentage + special dividend × franking percentage) / after-tax accounting profit excluding the amount attributable to non-controlling interest. SIZE is the natural logarithm of sales revenue.

Panel B shows the coefficients for the variables in the regression model. In a nutshell, the results are consistent with the two hypotheses developed in Section 5.2. Specifically, neither of the coefficients for the two foreign subsidiary location indicators (LOW and HIGH) is significantly different from zero, suggesting that companies with subsidiaries incorporated in low- or high-tax countries do not have significantly lower or higher CETR than do companies without such foreign subsidiaries, after controlling for franked dividend distributions, firm size, industry affiliation effect and year-specific characteristics.

For the control variables, consistent with the results reported for the full sample in Chapter 4, the franked dividend distributions measure, FDD, is positively associated with CETR. The coefficient for FDD is 0.1226 (rounded to four decimal places) and is significant at the 1% level. However, SIZE is not significantly related to CETR. As for industry affiliation effect, the Retailing industry indicator (GICS code 2550) has a coefficient significantly different from zero (significant at the 10% level). Its positive coefficient, 0.0344, suggests that, on average, companies operating in the Retailing industry have slightly higher CETR than do companies operating in the Energy industry (the base industry). The year dummy variables—Year 2010, Year 2011 and Year 2012—have negative coefficients that are significant at the 1%, 10% and 1% levels, respectively. This means that the companies in the three years after 2009 have CETR lower than that for 2009, probably because of their increased use of tax losses.

5.4.5 Additional Analyses

Interaction effect

The insignificant relations between CETR and LOW and between CETR and HIGH may be confounded by companies having subsidiaries incorporated in both low- and high-tax countries, as CETR is an aggregate measure of worldwide tax liability. The correlation matrix presented in Table 5.4 indicates that LOW and HIGH are positively correlated with each other at the 1% level. Having subsidiaries incorporated in both low- and high-tax countries may result in neutralised CETR, which means that, in the absence of profit shifting across countries, the negative effect of LOW and positive effect of HIGH on CETR may cancel out each other. Therefore, additional analyses are performed to isolate firm-year observations with low-tax subsidiaries only or high-tax subsidiaries only from those with both low- and high-tax subsidiaries. For this purpose, the interaction term

between LOW and HIGH is incorporated in the original OLS regression model. The extended model is shown as follows:

$$\text{CETR} = \alpha + \beta_1\text{LOW} + \beta_2\text{HIGH} + \beta_3\text{LOW*HIGH} + \beta_4\text{FDD} + \beta_5\text{SIZE} + \beta_{6\text{-}23}\text{IND} + \beta_{24\text{-}26}\text{YEAR} + \varepsilon \quad \text{Eq. (5.4)}$$

With the original two subsidiary location indicators and added interaction term, firm-year observations are categorised into the following four groups based on their foreign subsidiaries' locations. The number of observations in each group is shown in the brackets (680 in total):

1. observations without subsidiaries incorporated either low- or high-tax countries—the base group (367)
2. observations with subsidiaries incorporated in low-tax countries, but not in high-tax countries (122)
3. observations with subsidiaries incorporated in high-tax countries, but not in low-tax countries (67)
4. observations with subsidiaries incorporated in low-tax countries, as well as subsidiaries incorporated in high-tax countries (124).

Table 5.6 presents the regression results for the extended OLS regression model with the interaction term. To improve the model fit, 16 firm-year observations with standardised residuals greater than 3 in absolute values are excluded, leaving 664 observations in the sample.[77] Panel A shows that, overall, the regression model is significant, as the F-statistic is 5.68. The model is able to explain 15.50% of the variations in CETR.

[77] Untabulated regression results before excluding the 16 firm-year observations yield the same conclusions as those reported in this section.

Table 5.6: Regression Results: Interaction Effect

Panel A: Model Summary				
No. of Obs.	R-square	Adj. R-square	F-statistic	Prob. > F
664	0.1882	0.1550	5.68	0.0000
Panel B: Coefficients				
Variables	Coef.	Std. Err.	t	P > |t|
LOW	0.0072191	0.011251	0.64	0.521
HIGH	-0.0079877	0.0143897	-0.56	0.579
LOW*HIGH	0.0203705	0.0196679	1.04	0.301
FDD	0.1225628	0.0147211	8.33	0.000
SIZE	0.0033873	0.0026361	1.28	0.199
Industry 1510	0.0100267	0.0208454	0.48	0.631
Industry 2010	0.0068306	0.0190443	0.36	0.720
Industry 2020	0.0119771	0.0207151	0.58	0.563
Industry 2030	0.0079514	0.02791	0.28	0.776
Industry 2510	0.0123936	0.042047	0.29	0.768
Industry 2520	0.0389395	0.0263917	1.48	0.141
Industry 2530	-0.003273	0.0238395	-0.14	0.891
Industry 2540	0.0264828	0.0270757	0.98	0.328
Industry 2550	0.0346526	0.0206075	1.68	0.093
Industry 3010	-0.0129814	0.0383641	-0.34	0.735
Industry 3020	-0.0315189	0.0270807	-1.16	0.245
Industry 3030	0.0456184	0.0447267	1.02	0.308
Industry 3510	0.0282207	0.0238849	1.18	0.238
Industry 3520	-0.0117953	0.0356999	-0.33	0.741
Industry 4510	-0.0133271	0.0222896	-0.60	0.550
Industry 4520	0.0283109	0.0362848	0.78	0.436
Industry 4530	0.0185502	0.0608978	0.30	0.761
Industry 5010	0.021765	0.0258081	0.84	0.399
Year 2010	-0.0326359	0.0108003	-3.02	0.003
Year 2011	-0.0201143	0.0109994	-1.83	0.068
Year 2012	-0.0333831	0.0109464	-3.05	0.002
Constant	0.1373469	0.0519328	2.64	0.008

CETR is calculated as (current income tax expense + tax adjustment – royalties and resource rent tax) / pre-tax accounting profit before the share of associates' profit or loss. LOW is a low-tax country subsidiary indicator which takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in a foreign country with STR not higher than 20% in the particular year, or 0 otherwise. HIGH is a high-tax country subsidiary indicator which takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in a foreign country with STR not lower than 35% in the particular year, or 0 otherwise. LOW*HIGH is the product of LOW and HIGH. FDD is calculated as (interim dividend × franking percentage + final dividend × franking percentage + special dividend × franking percentage) / after-tax accounting profit excluding the amount attributable to non-controlling interest. SIZE is the natural logarithm of sales revenue.

As indicated in Panel B, neither of the original two subsidiary location indicators has a coefficient significantly different from zero, consistent with the results reported in Table 5.5. Moreover, the coefficient for the interaction term is also insignificantly different from zero. The insignificant coefficients for LOW, HIGH and LOW*HIGH indicate that companies with low-tax subsidiaries, but not high-tax subsidiaries; with high-tax subsidiaries, but not low-tax subsidiaries; or with both low- and high-tax subsidiaries do not have significantly different CETR than companies without such subsidiaries (the base category). This finding provides strong, though indirect, evidence that Australian listed companies without foreign ownership among the top 20 shareholders would shift foreign profits back to Australia, even at the expense of foregoing the apparent benefits (tax savings) of lower tax rates in foreign countries.

To elaborate on this, without shifting foreign profits to Australia, companies with subsidiaries incorporated in low-tax countries, but not high-tax countries, are expected to have lower CETR than do companies without such subsidiaries (the base group), which would be manifested in a significantly negative coefficient for LOW. Similarly, without shifting profits to Australia, companies with subsidiaries incorporated in high-tax countries, but not low-tax countries, are expected to have higher CETR than do companies without such subsidiaries (the base group), which would be manifested in a significantly positive coefficient for HIGH. Without shifting profits to Australia, the coefficient for LOW*HIGH is expected to be indeterminate: the sign depends on the relative sizes of profits generated in low-tax countries and high-tax countries and whether the profits of subsidiaries in high-tax countries are shifted to subsidiaries in low-tax countries.

In short, the main test and the above additional analysis together support the conjecture that Australian listed companies are likely to shift foreign profits back to Australia to pay Australian income tax for the purpose of distributing franked dividends.

Subsidiaries in foreign zero-tax countries

Among low-tax countries, those with zero corporate tax rates can be appealing profit shifting destinations. This is because the same amount of pre-tax profits, regardless of whether subject to Australian tax only or subject to zero foreign tax, would yield the same after-tax returns to shareholders if distributed as dividends (fully franked if the profits are taxed in Australia, or unfranked if the profits are taxed at a zero rate in foreign

countries).[78] Thus, it is interesting to further investigate whether companies with subsidiaries incorporated in zero-tax countries have lower CETR than companies without such subsidiaries. For this purpose, a new variable, ZERO, is included in the original regression model (Equation 5.1). It takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in a zero-tax country, and 0 otherwise. Accordingly, LOW is revised (denoted as LOW-R) to take the value of 1 if the firm-year observation has at least one subsidiary incorporated in countries with STR greater than 0, but not higher than 20%, and 0 otherwise. There is no overlap between the two indicators (LOW-R and ZERO). The revised regression model is presented as follows:

$$\text{CETR} = \alpha + \beta_1\text{ZERO} + \beta_2\text{LOW-R} + \beta_3\text{HIGH} + \beta_4\text{FDD} + \beta_5\text{SIZE} + \beta_{6\text{-}23}\text{IND} + \beta_{24\text{-}26}\text{YEAR} + \varepsilon \quad \text{Eq. (5.5)}$$

Table 5.7 presents the regression results for the above OLS regression model with ZERO and LOW-R. To improve the model fit, 16 firm-year observations with standardised residuals greater than 3 in absolute values are excluded, leaving 664 observations in the sample.[79] Panel A shows that the adjusted R-square is 0.1545, suggesting that the model can explain approximately 15.45% of the variations in CETR. The F-statistic is 5.66.

[78] A pre-tax profit of $100, if subject to zero foreign tax and distributed to shareholders as unfranked dividends, would be taxed at the shareholders' level at the shareholders' marginal tax rates.

[79] Untabulated regression results before excluding the 16 firm-year observations yield the same conclusions as those reported in this section, except for significantly (at the 5% level) positive coefficient for ZERO. In fact, there are only 51 observations with subsidiaries incorporated in zero-tax countries. Thus, without excluding the outliers (observations with standardised residuals greater than 3 in absolute values), the regression results may be influenced or biased by the outliers.

Table 5.7: Regression Results: Zero-Tax Foreign Countries

Panel A: Model Summary				
No. of Obs.	R-square	Adj. R-square	F-statistic	Prob. > F
664	0.1877	0.1545	5.66	0.0000
Panel B: Coefficients				
Variables	Coef.	Std. Err.	t	P > |t|
ZERO	0.0210307	0.0169979	1.24	0.216
LOW-R	0.0099607	0.0096952	1.03	0.305
HIGH	0.002165	0.010058	0.22	0.830
FDD	0.1229017	0.0147352	8.34	0.000
SIZE	0.0032249	0.0026894	1.20	0.231
Industry 1510	0.0079265	0.0207573	0.38	0.703
Industry 2010	0.0085877	0.0192547	0.45	0.656
Industry 2020	0.0129587	0.0208487	0.62	0.534
Industry 2030	0.0088063	0.0279321	0.32	0.753
Industry 2510	0.0077899	0.0416233	0.19	0.852
Industry 2520	0.0409518	0.0265723	1.54	0.124
Industry 2530	-0.0061421	0.0238417	-0.26	0.797
Industry 2540	0.0263332	0.0270797	0.97	0.331
Industry 2550	0.036319	0.0207539	1.75	0.081
Industry 3010	-0.0170823	0.038166	-0.45	0.655
Industry 3020	-0.0297841	0.027099	-1.10	0.272
Industry 3030	0.0456843	0.0448141	1.02	0.308
Industry 3510	0.0296027	0.0239753	1.23	0.217
Industry 3520	-0.007049	0.0358717	-0.20	0.844
Industry 4510	-0.0126385	0.0223535	-0.57	0.572
Industry 4520	0.0310848	0.0363886	0.85	0.393
Industry 4530	0.0174101	0.0609179	0.29	0.775
Industry 5010	0.0216577	0.0258099	0.84	0.402
Year 2010	-0.0320955	0.0107937	-2.97	0.003
Year 2011	-0.0195944	0.0109881	-1.78	0.075
Year 2012	-0.0323665	0.0109629	-2.95	0.003
Constant	0.1379219	0.0523655	2.63	0.009

CETR is calculated as (current income tax expense + tax adjustment – royalties and resource rent tax) / pre-tax accounting profit before the share of associates' profit or loss. ZERO is a zero-tax country subsidiary indicator which takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in a zero-tax (STR) foreign country in the particular year, or 0 otherwise. LOW-R is a low-tax country subsidiary indicator which takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in a foreign country with STR greater than 0 but not higher than 20% in the particular year, or 0 otherwise. HIGH is a high-tax country subsidiary indicator which takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in a foreign country with STR not lower than 35% in the particular year, or 0 otherwise. FDD is calculated as (interim dividend × franking percentage + final

dividend × franking percentage + special dividend × franking percentage) / after-tax accounting profit excluding the amount attributable to non-controlling interest. SIZE is the natural logarithm of sales revenue.

As indicated in Panel B, the coefficient for ZERO is insignificantly different from zero, suggesting that companies with subsidiaries incorporated in zero-tax countries do not have significantly different CETR than do companies without such subsidiaries. This means that companies have strong incentives to shift foreign profits to Australia to frank their dividend distributions. Consistent with the main test results presented in Section 5.4.4, the coefficients for LOW-R and HIGH are insignificantly different from zero.

In addition, Appendix H presents the results of the regression that incorporates the two- and three-way interaction terms among ZERO, LOW-R and HIGH. Similar to the results reported in Table 5.6 (the regression incorporates the interaction term between LOW and HIGH), none of the two- and three-way interaction terms has a coefficient that is significantly different from zero.

5.5 Robustness Checks

Two robustness checks are performed to ensure the reliability of the reported insignificant relation between foreign subsidiaries' locations and CETR. First, as in Chapter 4, a number of additional control variables are included in the original model in section 5.4.4, namely, profitability, capital intensity, intangible intensity, leverage, growth opportunity, and cash flow constraint. The results are presented in Appendix I. After controlling for the additional firm-level characteristics, the previously documented insignificant relations between LOW and CETR, and between HIGH and CETR, still hold.

Second, the franked dividend distributions measure, FDD, is replaced with a profitability measure. The regression results are presented in Appendix J. After the replacement, the coefficients for LOW and HIGH are still insignificantly different from zero.

5.6 Limitations

The main limitation of the study is that the findings provide only indirect evidence of the inward shifting of foreign profits to Australia by Australian listed companies with subsidiaries incorporated in foreign low-tax and/or high-tax countries. Nevertheless, the evidence presented in this chapter is stronger and more convincing than that in Chapter 4. Without subsidiary-level intra-group trade data, it is difficult to document direct evidence of the inward profit shifting conjecture.

In addition, the categorisation of foreign subsidiary locations into low- and high-tax countries based on the STR sourced from KPMG (2016) may not be precise. It is noticed that some countries levy different tax rates on different types of business activities. However, it is impossible to identify the specific business activities that a foreign subsidiary undertakes in that particular country. Therefore, in cases where no additional information indicates otherwise, it is assumed that no special tax rate is applicable. This assumption might lead to misclassification in some rare cases.

5.7 Summary and Conclusion

This chapter provides further investigation of the insignificant association between corporate tax avoidance as measured by CETR, and the extent of foreign operations as measured by FOP in Chapter 4. By categorising the locations of foreign subsidiaries of Australian listed companies with no foreign ownership among the top 20 shareholders into low-tax countries (STR not higher than 20%) and high-tax countries (STR not lower than 35%), this study finds that different locations of foreign subsidiaries do not contribute to variations in CETR. This implies that Australian companies with subsidiaries incorporated in low- or high-tax countries shift their foreign profits back to Australia. This inward profit shifting facilitates the constant distributions of franked dividends, thereby providing a great level of tax benefits to shareholders in the Australian dividend imputation system.

It should be noted that the sample companies in this study are narrowed to those without foreign ownership among the top 20 shareholders. Thus, the inward profit shifting behaviour may only apply to companies with foreign operations, but without foreign ownership. The previous chapter finds that companies with foreign ownership tend to engage in corporate tax avoidance. Thus, Chapter 6 further examines the relationship between foreign ownership and corporate tax avoidance in the Australian dividend imputation system.

Chapter 6: Effect of Foreign Ownership on Corporate Tax Avoidance in the Australian Dividend Imputation System

6.1 Introduction

This chapter addresses the third research question raised in Chapter 1:

Do large Australia companies with substantial foreign ownership engage in cross-border profit shifting—particularly intra-group transfer pricing and thin capitalisation—to reduce Australian tax?

Chapter 4 shows that, in the Australian dividend imputation system, listed Australian companies with greater foreign ownership engage in greater corporate tax avoidance because their foreign shareholders cannot claim the tax offset for the franking credits received hence view corporate income tax as a real cost that needs to be minimised to maximise their after-tax returns.

The study reported in this chapter extends the one reported in Chapter 4 and investigates the effect of foreign ownership on corporate tax avoidance in Australia by way of cross-border profit shifting—particularly intra-group transfer pricing and thin capitalisation.

Cross-border profit shifting from high- to low-tax countries results in erosion of the tax bases, and subsequently lowered tax payments due in the high-tax countries in which the MNEs operate. This cross-border tax avoidance practice is referred to by the OECD (2013) as BEPS, which has gained increasingly greater prevalence in the wake of accelerated globalisation. For example, the U.S. Congressional Research Service reports that 'U.S. corporations are artificially inflating the proportion of their global profits that are generated in small, low-tax countries—in other words, shifting their profits to tax havens' (Citizens for Tax Justice 2013). Recent Congressional hearings in the U.S. reveals that Apple Inc., the giant technology company, successfully sheltered US$44 billion from taxation worldwide by implementing a creative yet simple international tax structure for the years 2009 to 2012 (Ting 2014). Microsoft and Hewlett-Packard are also investigated by the U.S. Congressional hearings for their international tax planning. In the U.K., Starbucks, Google and Amazon are challenged for their high-revenue, yet low-tax positions. In Australia, Pfizer, Apple and Airbnb are questioned for the reasons behind

their complex corporate structures and the extent to which tax regimes affected the locations of the parent and subsidiaries (Parliament of Australia 2015).

To examine the impact of foreign ownership on tax-induced cross-border profit shifting, two groups of large Australian companies are selected to be compared on their Australian tax avoidance arrangements: FOACs (foreign-owned Australian companies) and DOLACs (domestic-owned listed Australian companies). FOACs are mainly established by foreign MNEs to conduct business in Australia, which means that they are part (subsidiaries) of the foreign MNE groups whose tax policies are determined by the foreign parent companies. They do not benefit from the dividend imputation system because their shareholders are not Australian residents. Based on the discussions and findings in Chapter 4, FOACs have strong incentives to avoid Australian tax because franking credits are valueless in the hands of their foreign shareholders. Since Australian corporate tax rate is relatively high, FOACs would perceive shifting Australian profits to related parties in low-tax countries an appealing Australian tax avoidance strategy. In contrast, DOLACs have fewer incentives to reduce Australian tax because doing so would reduce their ability to distribute franked dividends to their Australian shareholders who can claim the franking credits as tax offsets. Thus, reducing Australian tax by shifting profits out of Australia are less likely to be observed on DOLACs.[80] It should be stressed that DOLACs can serve as the benchmark (representing companies without strong incentive to avoid tax or shift profits to low-tax countries) because they operate in the full dividend imputation system in Australia. In countries without such a system (e.g. the U.S.), it may be difficult to identify companies to serve as the benchmark.

Tax-induced cross-border profit shifting is achieved mainly via intra-group transfer pricing and thin capitalisation. In the context of international tax avoidance by MNEs, intra-group transfer pricing aims to manipulate 'the monetary value attaching to goods, services and intangibles traded between units of the same group which cross national boundaries' (Elliott & Emmanuel 2000, p. 216), so that higher profits are recorded in countries with lower tax rates.[81] Thin capitalisation refers to 'thinly capitalis[ing] foreign affiliates in high-tax countries and rely[ing] instead to an excessive extent on debt

[80] Chapter 5 provides indirect evidence on inward profit shifting by Australian listed companies with foreign operations. Thus, it is possible that DOLACs with foreign operations also engage in cross-border profit shifting, but in the direction towards Australia.

[81] Transfer price *per se* is 'the price an organization must charge or pay to transfer goods from one subsidiary or internal branch to another segment of the same organization' (Barnhouse, Booth & Wester 2012, p. 2)

financing' (Merlo & Wamser 2014, p. 27). With thin capitalisation, internal debts borrowed by subsidiaries in high-tax countries from subsidiaries in low-tax countries can also be used as an indirect way to shift profits from high- to low-tax countries, as higher interest expenses, and thus lower profits, are booked in high-tax countries.

The shifting of profits or debts occurs at the affiliate-level. Without affiliate-level information or intra-firm trade data, it is difficult to determine whether intra-group transactions are undertaken for tax avoidance purposes. Prior studies mainly rely on financial data to proxy for the outcome of the tax-induced intra-group transfer pricing and thin capitalisation. This chapter argues that, if FOACs engage in intra-group transfer pricing to shift Australian profits to their affiliates in foreign low-tax countries, they would have reduced gross profit margins and operating profit margins because of the inflated costs of purchases of goods and services or depressed selling prices. Given the high corporate tax rate in Australia, if FOACs are thinly capitalised to claim substantial tax deductions for interest expenses, one would observe substantial interest expenses and relatively high leverage ratios for FOACs. If, by engaging in intra-group transfer pricing, thin capitalisation, or both, FOACs effectively shift profits out of Australia, they would have lowered pre-tax profits, as well as lowered income tax expenses.

Paired sample *t*-tests are performed to compare a sample of FOACs with a sample of DOLACs in terms of six financial ratios that are designed to capture intra-group transfer pricing, thin capitalisation, and the effectiveness of the two profit shifting methods to avoid tax. The results indicate that, compared with the matched DOLACs, FOACs have lower gross profit to sale revenue ratios, lower EBIT to sales revenue ratios, higher interest expense to sales revenue ratios, lower pre-tax profit to sales revenue ratios, and lower income tax expense to sales revenue ratios. No significant difference is documented between matched FOACs and DOLACs in leverage. Nevertheless, the higher interest expenses, yet similar leverage ratios of FOACs compared with matched DOLACs imply that FOACs may pay higher interest rates on intra-group debts than arm's length interest rates to claim more tax deductions. Therefore, it can be concluded that FOACs use intra-group transfer pricing and pay high interest rates on intra-group debts to shift profits out of Australia to reduce their Australian tax burdens.

Multivariate regression analyses are also performed on both unmatched and matched samples. The six financial measures of intra-group transfer pricing, thin capitalisation and the effectiveness of the two profit shifting methods are regressed on a FOAC indicator

along with the control variables. The results are consistent with the findings from the paired sample *t*-tests.

The remainder of this chapter is organised as follows. Section 6.2 reviews the literature on tax-induced intra-group transfer pricing and thin capitalisation, including relevant policy recommendations made by the OECD and relevant legislations in Australia. Hypotheses are developed based on the discussion. Section 6.3 explains the sample selection and introduces the propensity score matching technique employed to construct matched samples. Section 6.4 presents the results from the paired sample *t*-tests and the multivariate regression analyses. Section 6.5 provides a robustness check. Section 6.6 discusses the limitations of the study. Finally, Section 6.7 summarises and concludes the chapter.

6.2 Literature Review and Hypotheses Development

MNEs engage in corporate tax avoidance typically via cross-border arrangements to take advantage of the differences in tax laws and tax rates across countries. In this study, the focus is on two main cross-border tax avoidance practices, as suggested in the literature and government reports: intra-group transfer pricing and thin capitalisation.

6.2.1 Intra-group Transfer Pricing

Definition and explanation

Intra-group transfer pricing is suggested to be the primary channel of tax avoidance for MNEs (e.g. Egger, Eggert & Winner 2010). It refers to the prices charged on the flow of goods and services between members of an MNE that operate in different countries with different tax rates. Using intra-group transfer pricing, MNEs shift profits from high-tax countries (such as Australia) to low-tax countries to take advantage of tax rate arbitrage.[82] The following numerical example illustrates how tax avoidance can be achieved via intra-group transfer pricing.

Suppose an MNE located in Country C has two foreign subsidiaries. Subsidiary A is a manufacturer operating in Country A with a low tax rate of 20%, while Subsidiary B is a distributor operating in Country B with a high tax rate of 40%. Subsidiary A produces

[82] KPMG (2016) provides a list of corporate tax rates around the world. Australian corporate tax rate (30%) is higher than the OECD average and the EU average.

Product A at a cost of $50 each, and sells it to Subsidiary B at a price of $80 each, which is the price that would be charged if the product was sold to external unrelated parties. Subsidiary B sells Product A in Country B to external customers at a price of $150 each.

Assuming for simplicity that there are no other costs, in the absence of tax-induced transfer pricing, for every product sold to Subsidiary B, Subsidiary A books a profit of $30 ($80 − $50), and pays income tax of $6 ($30 × 20%). Likewise, for every product sold to external customers, Subsidiary B books a profit of $70 ($150 − $80), and pays income tax of $28 ($70 × 40%). In total, the MNE makes a pre-tax profit of $100 ($150 − $50) and pays income tax of $34 ($6 + $28) with an ETR of 34% ($34 / $100).

With tax-induced transfer pricing, subsidiary-level profits are shifted or reallocated to low-tax countries, so that a larger proportion of the total profit is taxed at the low rates. For example, to accomplish the tax-induced profit shifting, Subsidiary A charges a higher price on Product A—say, $120 each. All else being constant, the profit booked by Subsidiary A now becomes $70 ($120 − $50) on which income tax of $14 ($70 × 20%) is payable. Subsidiary B generates a lower profit of $30 ($150 − $120), and pays income tax of $12 ($30 × 40%). At the group level, the MNE still makes a profit of $100 ($150 − $50), but is liable to pay income tax of only $26 ($14 + $12) with an ETR of 26%.

The above example clearly demonstrates the influence of intra-group transfer pricing on an MNE's overall tax liability. In particular, for subsidiaries in high-tax countries, intra-group transfer pricing results in increased tax deductions because of inflated costs of purchases, or decreased assessable income because of depressed selling prices, and, ultimately, reduced tax liabilities. For subsidiaries in low-tax countries, the effect would be the opposite.

Evidence on tax-induced intra-group transfer pricing

Ideally, tax-motivated intra-group transfer pricing would best be detected by examining subsidiary-level financial and tax data, or intra-group trade data. However, all intra-group transactions are eliminated upon consolidation, which renders the detailed subsidiary-level data unavailable to most researchers. As a result of the lack of intra-group trade data, extant studies mainly rely on examining the relationship between foreign subsidiaries' profitability levels and local tax rates to provide indirect evidence of tax-motivated intra-group transfer pricing. A negative relation indicates profit shifting for tax avoidance

because greater profit is booked in low-tax countries, and consequently the group as a whole has lower tax liability.

Early studies based on aggregate country-level data document a negative relation between foreign subsidiaries' tax rates and profitability levels (e.g. Grubert & Mutti 1991; Hines & Rice 1994). Recent firm-level studies address whether and how the tax rate differential among subsidiaries and between subsidiaries and their parent companies affects their respective profitability levels. For instance, Dischinger (2007) undertakes an econometric panel study based on firm-level data of European subsidiaries of MNEs. He reveals a negative relation between a subsidiary's pre-tax profit and the STR differential of the subsidiary relative to its foreign parent. Further analysis shows that subsidiaries located in countries with high tax rates (relative to that of the parent company) shift out approximately three times more profits than do subsidiaries in low-tax countries (Dischinger 2007). Similarly, Huizinga and Laeven (2008) also find supporting evidence for tax-induced profit shifting among foreign subsidiaries of European MNEs operating in the manufacturing industry.

Different from many cross-border profit shifting studies that focus on the negative relation between tax rate differential and subsidiaries' profitability levels, Egger, Eggert and Winner (2010) investigate the extent to which foreign plant ownership involves lower tax payments than domestic plant ownership in Europe. They use the propensity score matching approach to match manufacturing plants that are foreign-owned with those that are domestic-owned, based on nine firm-level, region-level, industry-level and region-industry-level characteristics that are expected to affect the probability of a plant being foreign-owned.[83] The matching approach helps eliminate the self-selection bias (into foreign ownership) that may confound results when comparing the tax payments of foreign-owned versus domestic-owned plants. With a series of *t*-tests using the matched sample, Egger, Eggert and Winner (2010) provide supporting evidence of MNEs' tax-induced profit shifting: in low-tax countries, subsidiaries of foreign MNEs make substantially greater profits than do their domestic counterparts; in contrast, in high-tax countries, they earn significantly lower profits than do comparable domestic firms.

[83] The nine firm-, region-, industry- and region-industry-level characteristics are firm age, number of plants in the same region and industry, ratio of MNEs to all firms in the same region and industry, number of employees in the same region, number of employees per firm in the same region and industry, annual labour costs in the same region, annual labour costs per employee in the same region and industry, material costs per firm in the same region and industry, and employees of the firm.

A few studies using intra-group trade data provide more direct supporting evidence for tax-induced intra-group transfer pricing. For instance, based on monthly intra-firm trade prices (both export and import) of MNEs with either subsidiaries or parent companies located in the U.S. over the period 1997 to 1999, Clausing (2003) reveals a strong relation between the trade countries' tax rates and the prices charged on the intra-group transactions. Specifically, when the tax rate of the trade country decreases, the U.S. intra-group export prices become lower and U.S. intra-group import prices become higher, relative to non-intra-group trade prices. This finding is consistent with tax-induced transfer pricing of MNEs.

Also using U.S. data, Bernard, Jensen and Schott (2006) investigate the forces for discrepancies in arm's-length and related-party transaction prices. In their study, related-party sales by a firm are matched to arm's-length sales by the firm for the same product on a destination country–month–transport mode basis. Bernard, Jensen and Schott (2006) show that the U.S. exporting prices for related parties are lower than that for arm's-length customers. Further, this price discrepancy is found to be larger when the destination country has lower tax rates and higher import tariffs (Bernard, Jensen & Schott 2006). These findings provide supporting evidence for MNEs' use of intra-group transfer pricing to take advantage of the tax differential across countries to avoid tax.

Tackling intra-group transfer pricing

In theory, tackling tax-induced transfer pricing is not difficult, as long as the price charged on the intra-group transaction can be determined as abnormal, or not 'at arm's length' as in a typical transaction between independent parties. Currently, the international standard used by the OECD and many other countries to deal with intra-group transfer pricing is the Arm's Length Principle (ALP). In defining the ALP, the OECD (2014, p. M-26) provides the following description in 'Article 9 Associated Enterprises' of the OECD Model Tax Convention:

> [when] conditions are made or imposed between the two enterprises in their commercial or financial relations which differ from those which would be made between independent enterprises, then any profits which would, but for those conditions, have accrued to one of the enterprises, but, by reason of those conditions, have not so accrued, may be included in the profits of that enterprise and taxed accordingly.

In applying the ALP, the OECD identifies five methods to determine the 'at arm's length' transfer prices of intra-group transactions within MNEs, three of which are collectively

known as the traditional transaction methods, while the other two are the transactional profit methods. The three traditional transaction methods are the comparable uncontrolled price method (CUP), resale price method (RPM) and cost plus method (CPLM). Under the CUP, the 'at arm's length' transfer price of an intra-group transaction is determined by referring to the price charged for similar goods or services in a comparable transaction, but between independent parties.

In an indirect manner, RPM and CPLM determine the 'at arm's length' transfer price by referring to the gross profit margin (the ratio of gross profit to sales revenue) achieved in similar transactions between independent parties (hereafter referred to as the 'external gross profit margin'). The difference between RPM and CPLM is that RPM generally applies to the distributor of an intra-group transaction (such as Subsidiary B in the numerical example of intra-group transfer pricing provided before), whereas CPLM generally applies to the manufacturer (such as Subsidiary A in the same numerical example). To be more specific, under the RPM, the 'at arm's length' price of Product A (which is Subsidiary B's cost of goods sold) is jointly determined by Subsidiary B's resell price (not subject to intra-group transfer pricing) and the external gross profit margin of a distributor. Under the CPLM, the 'at arm's length' price of Product A (which is Subsidiary A's sales revenue) is jointly determined by Subsidiary A's manufacturing cost (not subject to intra-group transfer pricing) and the external gross profit margin of a manufacturer.

In cases where the three traditional transaction methods cannot be reliably applied because, for example, the intra-group transaction involves unique intangibles or highly integrated activities, or there is no external gross margin that can be reliably used, the two transactional profit methods should be considered. One is the transactional net margin method, which is similar to the RPM and CPLM, yet focuses on the operating profit margin (the ratio of operating profit to an appropriate base such as sales revenue). Operating profit is the difference between gross profit and operating expenses.

The second transactional profit method is the profit split method, which is the most appropriate method if the two related parties possess valuable intangible assets, or are integrated. In applying this method, the first step is to calculate the total profit generated by the two related parties. The total profit is then split between the two parties based on an appropriate splitting percentage, which is determined based on comparable circumstances between unrelated parties or internal data.

The ALP framework developed by the OECD seems to be relatively comprehensive, as it covers different situations or transactions in different natures. Nevertheless, the ALP has been challenged by some researchers, who argue that the principle may be difficult to implement and sustain in the long term. Examples of the weakness of the ALP include the difficulty in identifying comparable transactions between independent parties (especially when unique intangible assets are involved), the failure in allocating profit that is generated from synergy effects that are unique to MNEs and cannot be obtained or achieved by independent companies, the undermined legitimacy as substantial discrepancies in prices can also be justified, and the high level of complexity in the rules that may lead to substantial compliance costs (e.g. Avi-Yonah & Benshalom 2011; Keuschnigg & Devereux 2013).

Intra-group transfer pricing in Australia

For Australia and many other countries with open economies, intra-group transfer pricing by MNEs is perceived as a threat to the economy. As Bradbury (2012) (then Assistant Treasurer) points out, 'profit-shifting can pose a serious threat to Australia's revenue base. In 2009, related party cross-border trade was valued at approximately $270 billion, representing about 50% of Australia's cross border trade flows'. In an effort to overcome the manipulation of international tax liabilities through intra-group transfer pricing, the Australian government introduced transfer pricing rules in Division 13 ITAA 36. The rules impose arm's length standards with respect to MNEs' internal dealings, as well as the trading of property or services between separate legal entities under international arrangements. In 2013, the Australian government introduced new transfer pricing rules in Division 815 ITAA 97 to align the application of the arm's length principle in Australian tax law with the international transfer pricing standards set by the OECD guidelines.[84] The ALP framework developed by the OECD provides guidance on how intra-group transfer pricing can be detected.

Intra-group transfer pricing is an appealing tax avoidance mechanism because of the substantial tax savings it provides and the difficulty of being challenged by the authority for reasons such as the non-existence of comparable transactions between independent parties. However, in the Australian divided imputation system, FOACs and DOLACs may have different attitudes towards intra-group transfer pricing. Specifically, given the

[84] Since this study covers the year 2012 only, any implications from the new rules are not considered.

relatively high corporate tax rate in Australia, FOACs have strong incentives to shift profits from Australia to foreign low-tax countries via intra-group transfer pricing because their foreign shareholders cannot enjoy the tax benefits of franking credits. FOACs' intra-group transfer pricing arrangements can take the form of supplying goods and services to related parties (other members in the MNE group) at depressed transfer prices, or by purchasing goods and services (including patented technologies) from related parties at inflated transfer prices. As a consequence, depending on the type of the goods and services that are transacted with related parties, FOACs would have reduced gross profit margins or reduced operating profit margins.

In contrast, as demonstrated in Chapter 4, DOLACs have fewer incentives to avoid Australian tax because reducing Australian tax payments may impede their ability to distribute franked dividends to satisfy their shareholders' demand. Thus, engaging in intra-group transfer pricing to shift profits out of Australia is not expected to be observed among DOLACs.

Without intra-group trade data, FOACs' engagement in tax-induced intra-group transfer pricing can only be revealed when they are compared with companies with similar operations but not affected by tax-induced intra-group transfer pricing activities, such as DOLACs. Unlike FOACs which are parts of foreign MNEs, DOLACs are the ultimate parent companies; thus, on consolidation, intra-group transactions and balances are eliminated and DOLACs' consolidated financial reports only reflect the results of transactions with external parties that are at arm's length, but not the results of any intra-group transfer pricing (except for the resultant tax expenses). Therefore, a comparison of FOACs' gross profit margins and operating profit margins (which reflect transactions with related parties) with DOLACs' (which reflect transactions with independent parties only) helps detect tax-induced intra-group transfer pricing by FOACs.

Based on the above discussion, this study hypothesises that FOACs engage in tax-induced intra-group transfer pricing to shift profits out of Australia, which is most likely manifested in lower gross profit margins and lower operating profit margins than those of DOLACs. Gross profit margins and operating profit margins are suggested as indicators for tax-induced intra-group transfer pricing. Thus, the following two hypotheses are developed:

Hypothesis 6.1A: FOACs have lower gross profit to sales revenue ratios than do comparable DOLACs.

Hypothesis 6.1B: FOACs have lower EBIT to sales revenue ratios than do comparable DOLACs.

6.2.2 Thin Capitalisation

Definition and explanation

Generally, thin capitalisation refers to the heavy use of debt, rather than equity, as a source of finance. Companies that are thinly capitalised (that is, with a low proportion of equity finance) are also known as highly leveraged or highly geared. In the context of cross-border tax avoidance, thin capitalisation can be viewed as shifting debts to subsidiaries located in high-tax countries (such as Australia) so that a high level of tax deduction for interest expense can be claimed, resulting in subsidiaries in high-tax countries being highly geared. The following example illustrates how thin capitalisation facilitates cross-border tax avoidance.

Suppose an MNE based in Country C establishes a subsidiary operating in Country B to distribute the products manufactured by the MNE. Country C has a corporate tax rate of 20%, whereas Country B has a corporate tax rate of 40%. The subsidiary is financed by $1 million equity capital and $4 million debt capital at an interest rate of 10% per annum, both from the MNE based in Country C. Thus, the interest expense incurred is $0.4 million ($4 million × 10%), which can be translated into $0.16 million ($0.4 million × 40%) tax savings for the subsidiary, compared with that if the $4 million is equity capital. From the perspective of the parent company, the interest revenue of $0.4 million only attracts $0.08 million ($0.4 million × 20%) additional tax liability. At the aggregate level, the MNE group achieves a tax saving of $0.08 million ($0.16 million − $0.08 million).

Evidence on thin capitalisation for international tax avoidance

Prior studies have documented MNEs' use of thin capitalisation for tax avoidance. For instance, Mills and Newberry (2004) examine the influence of tax rates on the tax reporting behaviour of U.S. subsidiaries of foreign MNEs. They find that, for foreign MNEs with relatively low average foreign tax rates (the U.S. tax rate is relatively high), their U.S. subsidiaries report lower taxable income, and have higher leverage ratios and higher interest expense to sales ratios. Mills and Newberry (2004) conclude that the income reporting strategies of the U.S. subsidiaries of foreign MNEs, as reflected in their U.S. debt policies, are tax-motivated.

Turning the angle to foreign subsidiaries of U.S. MNEs, Desai, Foley and Hines (2004) document a positive relation between leverage levels and local tax rates for foreign subsidiaries: 10% higher local tax rates are associated with 2.8% higher leverage ratios. Moreover, Huizinga, Laeven and Nicodeme (2008) develop a model of MNEs' optimal debt policies that considers international taxation factors. Based on a sample of 32 European countries during the period 1994 to 2003, and using firm-level data on the financial structures of standalone domestic firms and MNEs, Huizinga, Laeven and Nicodeme (2008) show that the capital structure of a foreign subsidiary of an MNE is affected by both the local tax rate and the tax rate differential across the countries in which the parent company and other foreign subsidiaries operate. For example, for an MNE with two subsidiaries in two countries, a 10% overall tax rate increase in one country would result in 2.4% increase in the leverage ratio in that country, yet a 0.6% decrease in the leverage ratio in the other country (Huizinga, Laeven & Nicodeme 2008).[85] In contrast, for standalone domestic firms, a 10% increase in the overall tax rate would lead to 1.8% increase in the leverage ratio.

Tackling thin capitalisation

To deter the tax base erosion at the national level caused by thin capitalisation, in 1987, the OECD released a report that provided policy recommendations on domestic thin capitalisation rules. Since then, an increasing number of countries have introduced thin capitalisation rules to limit the amount of interest expenses that can be claimed as tax deductions by companies. In the OECD's (2012) draft titled 'Thin Capitalisation Legislation: A Background Paper for Country Tax Administrations', the organisation recognises two primary approaches by which thin capitalisation rules in various countries normally operate: (1) determining a maximum amount of debt on which interest payments can be claimed as tax deductions, and (2) determining a maximum amount of interest that is deductible by referring to interest ratios, such as interest to operating profit or cash flow.

Under the first approach (determining the maximum amount of debt), interest on the excessive debt (debt above the determined maximum amount of debt or debt limit) is not deductible for tax purposes. Generally, there are two ways to determine the debt limit: the arm's length approach and ratio approach. The arm's length approach determines the debt limit as the amount of debt that an independent lender would be willing to lend to the

[85] In Huizinga, Laeven and Nicodeme (2008), the overall tax rate captures both corporate income taxes and non-resident dividend withholding taxes.

specified company, considering the specific company's circumstances. However, because it is based on an understanding of the independent lender's decision-making process, substantial resources and skills are required. Under the ratio approach, the debt limit is determined by a pre-set ratio, such as a debt-to-equity ratio of 3:1. This approach is simple to implement and provides certainty and confidence to companies with regard to the level of debt that will not be challenged by tax authorities. However, since the predetermined ratio is one-size-fits-all, specific market conditions or industry-wide characteristics are overlooked. Buettner et al. (2012) notice that, during the 10-year period from 1996 to 2005, OECD countries with thin capitalisation rules or alike employed the ratio approach.

The second approach of formulating thin capitalisation rules (determining maximum amount of interest, rather than debt) is sometimes referred to as the 'earnings stripping' approach. Germany and Italy generally limit the interest deduction at 30% of earnings before interest, tax, depreciation and amortisation (EBITDA).[86]

Thin capitalisation rules have been suggested to be effective in shaping MNEs' capital structures. Take two examples from the U.S. and Germany for illustration. Blouin et al. (2014) investigate the effect of thin capitalisation rules on the capital structures of U.S. MNE's foreign affiliates over the period 1982 to 2004. They report that the debt-to-asset ratio limitation reduce the ratio by 1.9% on average, and the restrictions on an affiliate's borrowing from the parent-to-equity ratio reduce the ratio by 6.3% (Blouin et al. 2014). Buettner et al. (2012) examine the capital structures of subsidiaries of all German MNEs in 36 countries during the period 1996 to 2004. They find that thin capitalisation rules effectively reduce the use of internal debt for tax avoidance, yet encourage greater use of external debt. Stated in a quantitative way, if a host country with a tax rate of 34% (the sample average) disallowed interest deduction for debt above the debt-to-equity ratio of 2:1, the internal debt ratio would be reduced by 12% or 24%, depending on the specific definition of thin capitalisation rule (Buettner et al. 2012).

Thin capitalisation in Australia

As with transfer pricing, Australia has legislated thin capitalisation rules to deal with the highly geared structures adopted by companies for tax avoidance. The current rules, contained in Division 820 ITAA 97, apply from the income year commencing on 1 July

[86] Germany amended its thin capitalisation rules to impose a special interest limitation rule that took effect from 2008. Italy abolished the previous asset to equity ratio approach in 2007.

2001 for Australian inward-investing entities, as well as outward-investing entities, on their total debt.[87] An inward-investing entity is an Australian entity that is controlled by a foreign entity. An outward-investing entity is an Australian entity controlling a foreign entity, with business performed through a foreign branch. Note that the thin capitalisation rules are different among general entities, financial entities and authorised deposit-taking institutions. The rules pertaining to general entities are described below.

The Australian thin capitalisation rules impose a debt limit (maximum allowable debt) above which tax deductions for interest incurred on exceeded level of debt are disallowed. The debt limit is determined by the type of the entity and by referring to one of the three measures:

1. the safe harbour debt amount: debt-to-asset ratio of 3:4, or debt-to-equity ratio of 3:1
2. the arm's length debt amount: the debt amount that an independent entity with the same operations in Australia would bear
3. the worldwide gearing debt amount: no more than 120% of the gearing of an outward-investing entity's worldwide controlled investments.

Specifically, for outward-investing entities, the debt limit is the greatest of the safe harbour debt amount, the arm's length debt amount, and the worldwide gearing debt amount; for inward-investing entities, the limit is the greater of the safe harbour debt amount and the arm's length debt amount.

In 2014, Australia tightened its thin capitalisation rules by reducing the debt limit from a debt-to-equity ratio of 3:1 to 1.5:1, and making available the worldwide gearing ratio to inbound investors, while reducing the ratio from 120% to 100%. The rules have not been amended further, despite the release of the BEPS Project (Action 4 Interest Deductions, 2015 Final Report) by the OECD in 2015 which suggests a fixed ratio approach to replace the previous thin capitalisation rules. Under the recommended approach, interest payments would not be deductible for tax purposes if the ratio of net interest expense to EBITDA exceeded a certain threshold in the range of 10% to 30% (OECD 2015).

As with intra-group transfer pricing, using thin capitalisation to claim more tax deductions for interest expenses incurred in Australia, and thereby shifting profits out of

[87] Amendments to the rules have taken effect from 1 July 2014. However, since the sample year is 2012 only, the amendments are not of particular relevance, but will be briefly mentioned later in this section.

Australia, may be perceived differently by FOACs and DOLACs. Given the relatively high corporate tax rate in Australia and the restriction to claim the franking credit tax offset by foreign shareholders, FOACs have strong incentives to claim substantial interest expenses to reduce their tax liabilities in Australia. In contrast, DOLACs have fewer incentives to adopt highly geared structures to claim substantial interest expenses to shift profits from Australia to foreign low-tax countries, because reducing Australian tax may not provide any real cost savings, yet impedes the company's ability to distribute franked dividends. As discussed in Chapter 3, a number of Australian studies observe declines in the leverage ratios of listed companies after the introduction of the dividend imputation system in Australia (e.g. Twite 2001).

DOLACs' consolidated financial reports only reflect the results of transactions with external parties, yet not the results of any internal debt shifting (except for the resultant tax expenses). Thus, DOLACs serve as a benchmark for the levels of debt and interest expense that Australian companies normally have. Therefore, comparing FOACs with DOLACs in terms of their interest expenses and leverage ratios can infer the use of thin capitalisation by FOACs to shift profits out of Australia.

Following the discussion above, this study hypothesises that FOACs employ thin capitalisation to increase their tax deductions for interest expenses, which is most likely manifested in higher interest expense to sales revenue ratios and higher leverage ratios in comparison with those of DOLACs. The level of interest expense and level of debt, as relative measures, are suggested and used by countries to formulate thin capitalisation rules. Thus, the following two hypotheses are developed:

Hypothesis 6.2A: FOACs have higher interest expense to sales revenue ratios than do comparable DOLACs.

Hypothesis 6.2B: FOACs have higher leverage ratios (long-term borrowings to total assets) than do comparable DOLACs.[88]

[88] Short-term borrowings are not included in the leverage calculation. Thin capitalisation is mostly achieved by intra-group debts. However, intra-group debts are not separately disclosed in financial reports. Short-term borrowings may include genuine third-party accounts payable, loans payable and tax payable, which means they contain more noise than long-term borrowings with respect to capturing intra-group debts.

6.2.3 Effectiveness of FOACs' Tax Avoidance Arrangements

Cross-border tax avoidance via intra-group transfer pricing and thin capitalisation cannot be captured by conventional tax avoidance measures, such as the ETR, because such tax avoidance arrangements result in simultaneous reductions in tax expense and pre-tax accounting profit. However, the effectiveness of using intra-group transfer pricing and thin capitalisation to shift profits out of Australia, thereby avoiding Australian tax, is most likely manifested in reduced pre-tax accounting profit (a proxy for taxable income) and reduced income tax expense (a proxy for tax liability).[89] Thus, if FOACs indeed engage in intra-group transfer pricing, thin capitalisation, or both to shift profits out of Australia, and their arrangements are effective in reducing their Australian tax liabilities, then it is expected that they have lower pre-tax accounting profits and lower income tax expenses, relative to sales revenues, than those of DOLACs. This leads to the following two hypotheses[90]:

Hypothesis 6.3A: FOACs have lower pre-tax accounting profit to sales revenue ratios than do comparable DOLACs.

Hypothesis 6.3B: FOACs have lower income tax expense to sales revenue ratios than do comparable DOLACs.

6.3 Research Design

6.3.1 Data Collection and Calculation

To test the hypotheses developed in Section 6.2, this study compares FOACs with DOLACs in terms of the six ratios capturing intra-group transfer pricing, thin capitalisation, and the effectiveness of these two methods in reducing Australian profits

[89] As will be explained in the next section, FOACs' annual reports are not publicly available, but can be purchased from the ASIC. Moreover, their annual reports are usually special purpose financial reports and do not disclose as much detailed information as the general purpose financial reports of listed companies. The current income tax expenses and tax adjustments data used to construct the relatively precise corporate tax liability measure in Chapters 4 and 5 are not disclosed by many FOACs. Thus, the income tax expenses that are available in FOACs' annual reports are used as the proxy for tax liabilities.

[90] Similar to the arguments in Sections 6.2.1 and 6.2.2, DOLACs' consolidated financial figures (other than tax expenses) only reflect the results of transactions with external parties. The tax expenses of DOLACs may be affected by arrangements with internal parties to avoid tax. As demonstrated in Chapters 4 and 5, DOLACs do not have strong incentives to avoid Australian tax, if they distribute after-tax profits to shareholders. For those with foreign operations, it is likely that foreign profits are shifted to Australia to be taxed at the Australian corporate tax rate of 30%. Therefore, arguably, the tax expense figures of DOLACs reflect the tax expenses of Australian companies without extensively engaging in Australian tax avoidance arrangements.

and income tax liabilities (hereafter referred to as the 'outcome ratios'). The six outcome ratios are defined and calculated as shown in the following six equations:

$$\text{Gross Profit Ratio} = \frac{\text{Sales revenue} - \text{Cost of goods sold}}{\text{Sales revenue}} \quad \text{Eq. (6.1)}$$

$$\text{EBIT Ratio} = \frac{\text{Pre-tax accounting profit} + \text{Interest expense}}{\text{Sales revenue}} \quad \text{Eq. (6.2)}$$

$$\text{Interest Expense Ratio} = \frac{\text{Interest expense}}{\text{Sales revenue}} \quad \text{Eq. (6.3)}$$

$$\text{Leverage} = \frac{\text{Long-term borrowings}}{\text{Total assets}} \quad \text{Eq. (6.4)}$$

$$\text{Pre-Tax Profit Ratio} = \frac{\text{Pre-tax accounting profit}}{\text{Sales revenue}} \quad \text{Eq. (6.5)}$$

$$\text{Income Tax Expense Ratio} = \frac{\text{Income tax expense}}{\text{Sales revenue}} \quad \text{Eq. (6.6)}$$

The Gross Profit Ratio and EBIT Ratio capture the outcome of engaging in intra-group transfer pricing. The Interest Expense Ratio and Leverage capture the outcome of using thin capitalisation. The Pre-Tax Profit Ratio and Income Tax Expense Ratio measure the extent to which profits are shifted out of Australia and the extent to which Australian tax liabilities are reduced, respectively.

To calculate the above ratios, financial data are hand-collected from annual reports that are either purchased from the ASIC (for FOACs) or available on DatAnalysis Premium (for DOLACs). Consistent with Chapters 4 and 5, the share of associates' profit or loss is excluded from the pre-tax accounting profit, and income tax expense does not include royalty-related taxation or resource rent tax. Some FOACs present their financial data in thousands of dollars; thus, for consistency, all financial data are collected in thousands of dollars.

6.3.2 Sample Selection

Initial sample

In the sample of Australian listed companies in Chapter 4, the results indicate that the mean and median values of foreign ownership are 0.0535 and 0, respectively. Therefore, it was impossible to obtain a sample, with reasonable size, of Australian listed companies that are substantially foreign-owned. In fact, FOACs are best represented by Australian subsidiaries of foreign MNEs because they are foreign-owned, yet operate in Australia

and therefore are subject to Australian corporate income tax. The main issue of using the Australian subsidiaries of foreign MNEs to represent FOACs is that they are not listed on the ASX and are thus not required to make their annual reports publicly available. Nevertheless, because of their large sizes, they are required to lodge annual reports with the ASIC. Consequently, their annual reports can be purchased from the ASIC at a cost of $38 each (per company, per year). As a result of the high cost of acquiring FOACs' annual reports, this study's decision regarding the sample year and size is subject to resource constraints. Considering the increasing publicity of the OECD's BEPS Project from 2013, and that the sample periods in the previous two chapters are 2009 to 2012, this study selects a sample period of 2012.[91]

This study takes the following steps to determine the FOACs for which annual reports are purchased from the ASIC. First, a list of Australia's top 2,000 companies in 2012 is obtained from IBISWorld.[92] The list includes public companies (both listed and non-listed), large proprietary companies, foreign-owned companies, trusts (such as large superannuation funds), and public sector and not-for-profit entities (such as universities and charitable organisations). Following this, a description of each of the companies, which is also available from IBISWorld, is examined. Companies described as 'subsidiaries' of foreign MNEs or 'wholly foreign-owned' are classified as FOACs. Additional efforts are made to identify companies with names appearing to associate with foreign MNEs, but whose foreign ownership cannot be confirmed by screening the information from IBISWorld.[93] Financial companies,[94] companies with operations in countries other than Australia and New Zealand, and companies without annual reports for 2012 available from the ASIC are excluded.[95] The above selection procedure results

[91] In addition, because the researcher commenced the PhD study in 2013, 2012 is the latest year with corporate annual reports available.

[92] This study focuses on the top 2,000 companies to increase the chance of finding foreign-owned companies, which tend to be large in size.

[93] For instance, the foreign ownership of some Australian companies is confirmed by examining the list of subsidiaries of their foreign parents. The list can usually be found in the foreign parents' annual reports or in the files lodged to the Securities and Exchange Commission by U.S. MNEs.

[94] FOACs in the financial industry (such as subsidiaries of foreign banks) are excluded because they are subject to prudential regulations and special thin capitalisation rules, so their operations and financial structures are different from other companies.

[95] This study excludes foreign-owned companies with operations in countries other than Australia and New Zealand to ensure that the foreign-owned companies included in the FOACs sample are not affected by other foreign tax rates or tax systems. For example, if an Australian subsidiary of a foreign MNE has subsidiaries in Singapore, its financial statement will reflect both the Australian and Singaporean operations. Further, its intra-group transactions with the Singaporean operating part are not reflected in its financial reports.

in 319 FOACs for which annual reports are purchased from the ASIC. In addition, for each of the FOACs, the parent company information in their annual reports is also examined to ensure that the FOAC is not a subsidiary of another FOAC included in the sample. In cases where a FOAC has a few subsidiaries in Australia, the financial data of the Australian consolidated group are collected.

The sample of DOLACs is based on companies listed on the ASX for 2012. Foreign companies, financial companies, trusts and stapled securities are first excluded.[96] The top 500 companies, ranked by sales revenue, are then taken to help better match FOACs and DOLACs in term of firm size because FOACs in the sample are generally large in size. Sales revenue, rather than total assets, is used as the ranking base because ranking based on total assets may result in a large number of mining firms with substantial assets being included in the sample, although they are still in their start-up stage and do not have significant operating revenues. To ensure that the companies selected as DOLACs have predominantly domestic ownership, this study excludes those with more than 20% foreign ownership among the top 20 shareholders (that is, FOW—the foreign ownership measure developed in Chapter 4—is restricted to be less than or equal to 20%).[97] The 20% threshold is employed to maintain a reasonably large sample size. In total, 423 companies are included in the DOLACs sample.

Six sub-samples

This study employs six sub-samples, extracted from the initial sample described above. Each sub-sample is used to test one of the six hypotheses—that is, it corresponds to one of the six outcome ratios. For example, the Gross Profit Ratio sub-sample is used to test Hypothesis 6.1A, and the EBIT Ratio sub-sample is used to test Hypothesis 6.1B. In each of the six sub-samples, companies with the corresponding outcome ratio greater than 1 or

[96] The ASX identifies 95 foreign incorporated entities quoted on the ASX in June 2012. Foreign companies are excluded because the Australian dividend imputation system does not apply to them. Financial companies are excluded because they are subject to special regulations and special disclosure requirements. Consequently, some of the required data items in this study are unavailable for financial companies. Trust funds and trusts in stapled securities are excluded because they are 'pass-through' entities for tax purposes. In addition, in Chapters 4 and 5, utilities companies are excluded because they are subject to special rules that regulate prices charged on utilities hence affect the companies' financial performance. In this study, utilities companies are not excluded. As will be explained in Section 6.3.3, FOACs are matched with DOLACs on the basis of industry groups, which reduces the industry affiliation effect.

[97] In total, 74 companies with FOW greater than 20% are excluded (including the two dual-listed companies: BHP Billiton and Rio Tinto Group). Three companies with no top 20 shareholder information are also excluded. Consistent with Chapters 4 and 5, New Zealand shareholders are not treated as foreign because the Australian and New Zealand governments have extended their dividend imputation systems to include companies residing in the other country under the trans-Tasman triangular imputation rules.

lower than 0 are excluded. For example, in the Gross Profit Ratio sub-sample, FOACs and DOLACs with a Gross Profit Ratio higher than 1 or lower than 0 are excluded. This is done to ensure that the results are not dominated by extreme values, which is essential because the sample sizes are relatively small. Thus, the size of each sub-sample varies, depending on the number of observations with extreme values.

The Gross Profit Ratio sub-sample is much smaller than all the other sub-samples because around 40% of the companies do not disclose cost of goods sold hence are excluded.[98] According to the *Australian Accounting Standards 101 Presentation of Financial Statements*, when presenting expense items in income statements, companies can use a classification based on the nature or function of the expenses, depending on which provides reliable and more relevant information. If the company chooses to present expense items based on the nature, no cost of goods sold will be presented in the income statements. Table 6.1 summarises the sizes and compositions (FOACs and DOLACs) of the six sub-samples.

Table 6.1: Sizes and Compositions of Sub-Samples

	FOACs	DOLACs	Total
Gross Profit Ratio Sub-Sample	219	229	448
EBIT Ratio Sub-Sample	260	321	581
Interest Expense Ratio Sub-Sample	319	422	741
Leverage Sub-Sample	316	421	737
Pre-Tax Profit Ratio Sub-Sample	250	308	558
Income Tax Expense Ratio Sub-Sample	271	342	613

6.3.3 Propensity Score Matching

Extant studies, such as those by Girma and Görg (2007) and Chari, Chen and Dominguez (2012), suggest the endogeneity of foreign ownership of companies. This means there are some systematic differences between foreign- and domestic-owned companies. Therefore, neither simple *t*-tests on the six outcome ratios, nor regressions of the six outcome ratios on a FOAC indicator, along with control variables, is an appropriate approach to examine whether FOACs engage in intra-group transfer pricing and thin capitalisation to shift profits out of Australia to reduce their Australian tax liabilities.

[98] Additional efforts are made to check whether the cost of goods sold is disclosed in the notes to financial statements.

To reduce the endogeneity issue, this study employs the propensity score matching technique developed by Rosenbaum and Rubin (1983) to construct a 'matched' or 'paired' sample of FOACs and DOLACs. In general, the propensity score is the probability of treatments (exposures or interventions) assignment conditional on observed baseline covariates (subject characteristics). It is estimated by using a logit model, where the treatment status, a binary variable, is regressed on observed baseline covariates (which are also referred to as explanatory variables). Propensity score matching matches the treated and untreated subjects with a similar value of the estimated propensity score, thereby controlling for the systematic differences in the baseline covariates between treated and untreated subjects. With a matched sample, one can estimate the treatment effect by comparing the outcomes between the two groups of subjects. In this study, the propensity score is the predicted probability of a company in the entire sample being a FOAC.

Propensity score matching has three main features that makes it appropriate for the setting in this study. First, it produces a sample with matched FOACs and DOLACs, so that the effect of the systematic differences (such as between industries and firm sizes) is alleviated. Second, when estimating the treatment effect (being a FOAC or not), the matching model does not require any specific function form and reduces the potential effect of nonlinearities (Lawrence, Minutti-Meza & Zhang 2011). Third, the propensity score (the probability of receiving treatment) allows matching across multiple observable baseline covariates, while reducing the dimensionality problem (Girma & Görg 2007).

In selecting the appropriate baseline covariates or explanatory variables for the matching model, no consensus has been achieved among empirical researchers (Austin 2011). However, Austin, Grootendorst and Anderson (2007) show that, when only the potential confounders (explanatory variables affecting the outcome variable) or true confounders (explanatory variables affecting both the treatment assignment and outcome variable) are included in the model to balance the treated and untreated subjects, the imbalanced variables are those affecting the treatment assignment, but not the outcome. Moreover, including either of the two confounders in the matching model helps generate a relatively precise estimation of the treatment effect, without introducing additional bias. Brookhart et al. (2006) argue that including variables affecting the treatment only, but not the outcome variable, results in increased variance of the treatment effect estimation, but not reduced bias. Thus, including explanatory variables that influence the outcome variable and/or the treatment assignment at the same time appears to be appropriate.

Therefore, in the context of this study, for each of the six sub-samples, the baseline covariates or the explanatory variables should be factors that influence the pertinent outcome ratio and may or may not influence the foreign ownership of the company. Among the six outcome ratios, Gross Profit Ratio, EBIT Ratio and Pre-Tax Profit Ratio are profitability measures; Income Tax Expense Ratio captures corporate tax avoidance or tax liability; and Interest Expense Ratio and Leverage reflect corporate capital structure. Prior studies commonly suggest firm size and industry affiliation to be determinants of profitability, tax avoidance and capital structure (e.g. Goddard, Tavakoli & Wilson 2005; Porter 1980; Titman & Wessels 1988).[99] Capital intensity or tangibility is suggested to be significant determinants of corporate capital structure, especially in Australia (e.g. Deesomsak, Paudyal & Pescetto 2004; Fan, Titman & Twite 2012).[100] Interestingly, firm size and industry affiliation are also foreign ownership influential factors. Egger, Eggert and Winner (2010) and Chari, Chen and Dominguez (2012) argue that large companies and companies in certain industries are more likely to be foreign-owned.

Based on the above discussion, for the sub-samples of Gross Profit Ratio, EBIT Ratio, Pre-Tax Profit Ratio and Income Tax Expense Ratio, the explanatory variables are firm size and industry dummy variables, while, for the sub-samples of Interest Expense Ratio and Leverage, the explanatory variables are firm size, industry dummy variables and capital intensity. Thus, the following two logit models, with different explanatory variables, are employed to estimate the propensity scores—that is, the probabilities of being a FOAC—for each of the sample companies:

$$\mathrm{FOAC} = \alpha + \beta_1 \mathrm{SIZE} + \beta_{2\text{-}20} \mathrm{IND} + \varepsilon \qquad \text{Eq. (6.7)}$$

$$\mathrm{FOAC} = \alpha + \beta_1 \mathrm{SIZE} + \beta_2 \mathrm{CAPINT} + \beta_{3\text{-}21} \mathrm{IND} + \varepsilon \qquad \text{Eq. (6.8)}$$

where:

- FOAC: FOAC indicator, taking the value of 1 if the company is a FOAC, and 0 otherwise

[99] Other profitability determinants—such as R&D expenditure and marketing or advertising expenditure—are not employed as the explanatory variables because FOACs, as subsidiaries of foreign MNEs, may not incur these expenditures themselves, but rely on the group with regard to product innovation, brand name establishment and advertising campaigns. Moreover, the financial statements of FOACs do not disclose as much detailed information as those of DOLACs. For FOACs, some expenditure items are not separately disclosed.

[100] Other capital structure determinants are capital market based, such as growth opportunities and share price performance. They are not available for FOACs because FOACs are not listed on the ASX.

- SIZE: firm size, measured by the natural logarithm of sales revenue[101]
- CAPINT: capital intensity, measured by non-current assets divided by total assets
- IND: industry dummy variables, created based on four-digit GICS codes.[102]

Table 6.2 presents the logit regression results from Equations (6.7) and (6.8). Note that due to matching on industry dummy variables, a few observations are excluded because of the non-existence of observations in the opposite group in the same industry.

From the two logit models, propensity scores are estimated for each of the companies in the six sub-samples. Within each sub-sample, each FOAC is then matched with a DOLAC, without replacement, that has the closest estimated propensity score within a maximum distance (caliper). The caliper is initially determined as 25% of the standard deviation of the propensity scores, truncated to two decimal places without rounding (Guo & Fraser 2015), then reduced in hundredth until reaching a balanced sample of FOACs and DOLACs—that is, FOACs are not significantly different from DOLACs on the explanatory variables at the 10% level.[103] If the caliper is reduced to 0.01 and a balanced sample is not reached, the caliper is further reduced in thousandth. Imposing a caliper is proposed as the best way to reduce possible poor matches and enhance balance in the explanatory variables (Shipman, Swanquist & Whited 2017).

[101] In comparison with other common firm size measures—such as total assets, market capitalisation and employee numbers—sales revenue is considered the most appropriate proxy for firm size. Total assets cannot capture the operating scales of FOACs, especially those with electronic commerce and those whose products are sold by themselves as well as other companies. For example, consider Apple Pty Ltd which is the Australian subsidiary of Apple Inc. The company not only has its own retailing stores in Australian metropolitan cities, but also wholesales or distributes its products to other consumer electronic stores, such as JB Hi-Fi. Market capitalisation cannot be used as the firm size measure in this study because FOACs are not listed on the ASX. Employee numbers are not disclosed by every company, and may include the number of contractors who may have a number of employees and subcontractors not included in the number disclosed.

[102] DOLACs' four-digit GICS codes are readily available from the commercial database, DatAnalysis Premium. However, FOACs' industry classification is not readily available and needs to be coded manually based on the principal activity information disclosed in their annual reports. There are 20 industries in total in which the sample companies operate. Thus, 19 industry dummy variables are created. The base industry is Energy, with a GICS code of 1010.

[103] For example, if the standard deviation of the estimated propensity score is 0.1895, then the initial caliper is calculated as 25% × 0.1895, truncated to 0.04. Since different sub-samples have different propensity scores, and subsequently different standard deviations of propensity scores, the imposed calipers vary across samples. Table 6.2 presents the specific calipers for each of the sub-samples. Attempts are also made to use calipers that are smaller than 0.25 of the standard deviations of the estimated propensity scores. The results are similar to those reported in Table 6.2.

Table 6.2: Logit Model Results

Panel A Gross Profit Ratio Sub-Sample (443 Obs.)				
	Coef.	Std. Err.	z	P > |z|
Constant	-6.23512	1.0376	-6.01	0.000
SIZE	0.410738	0.07262	5.66	0.000
Industry 1510	0.545731	0.49486	1.10	0.270
Industry 2010	1.07836	0.48634	2.22	0.027
Industry 2020	1.327119	0.65545	2.02	0.043
Industry 2030	2.178869	1.19795	1.82	0.069
Industry 2510	1.970901	0.7804	2.53	0.012
Industry 2520	-0.01262	0.78883	-0.02	0.987
Industry 2530	-0.47848	1.16326	-0.41	0.681
Industry 2540	1.482926	0.84101	1.76	0.078
Industry 2550	2.31104	0.50449	4.58	0.000
Industry 3010	1.606386	0.98211	1.64	0.102
Industry 3020	1.197658	0.57585	2.08	0.038
Industry 3030	2.415148	1.2416	1.95	0.052
Industry 3510	1.274622	0.56055	2.27	0.023
Industry 3520	0.97501	0.80601	1.21	0.226
Industry 4510	1.015743	0.64405	1.58	0.115
Industry 4520	2.007115	0.6258	3.21	0.001
Industry 4530	.	.	.	.
Industry 5010	-0.03742	1.19035	-0.03	0.975

Panel B EBIT Ratio Sub-Sample (580 Obs.)				
	Coef.	Std. Err.	z	P > |z|
Constant	-3.31428	0.84264	-3.93	0.000
SIZE	0.189239	0.05973	3.17	0.002
Industry 1510	0.34109	0.45633	0.75	0.455
Industry 2010	0.807486	0.41537	1.94	0.052
Industry 2020	-0.0868	0.49577	-0.18	0.861
Industry 2030	0.0214	0.6169	0.03	0.972
Industry 2510	1.885001	0.91329	2.06	0.039
Industry 2520	0.5228	0.6769	0.77	0.440
Industry 2530	-1.46641	0.82499	-1.78	0.075
Industry 2540	0.37161	0.62193	0.60	0.550
Industry 2550	1.935115	0.43507	4.45	0.000
Industry 3010	1.14917	0.83521	1.38	0.169
Industry 3020	0.920768	0.52575	1.75	0.080
Industry 3030	2.416611	1.17755	2.05	0.040
Industry 3510	0.913059	0.47964	1.90	0.057
Industry 3520	0.66689	0.74999	0.89	0.374
Industry 4510	0.31158	0.5195	0.60	0.549
Industry 4520	2.290025	0.62849	3.64	0.000
Industry 4530	.	.	.	.
Industry 5010	-0.0038	0.70129	-0.01	0.996

Industry 5510	0	.	.	.
Pseudo R-square	*0.1478*			
Caliper	*0.05*			

Industry 5510	0.07121	0.79926	0.09	0.929
Pseudo R-square	*0.1120*			
Caliper	*0.04*			

Panel C Interest Expense Ratio Sub-Sample (740 Obs.)				
	Coef.	Std. Err.	z	P > |z|
Constant	-3.082482	0.7800295	-3.95	0.000
SIZE	0.3607459	0.0566898	6.36	0.000
CAPINT	-3.744285	0.4210181	-8.89	0.000
Industry 1510	0.3016014	0.4202432	0.72	0.473
Industry 2010	-0.3810947	0.4194045	-0.91	0.364
Industry 2020	-0.4199125	0.475975	-0.88	0.378
Industry 2030	0.0097727	0.6377255	0.02	0.988
Industry 2510	0.696011	0.7369267	0.94	0.345
Industry 2520	-0.4893064	0.6673301	-0.73	0.463
Industry 2530	-1.209472	0.7441346	-1.63	0.104
Industry 2540	0.433796	0.5770326	0.75	0.452
Industry 2550	0.7207028	0.4389619	1.64	0.101
Industry 3010	0.2491008	0.8148224	0.31	0.760
Industry 3020	0.8723609	0.5005532	1.74	0.081
Industry 3030	0.78076	0.9723727	0.8	0.422
Industry 3510	-0.3210669	0.5054451	-0.64	0.525
Industry 3520	0.5054552	0.761853	0.66	0.507
Industry 4510	-0.4300584	0.5179897	-0.83	0.406
Industry 4520	0.5528407	0.5754408	0.96	0.337
Industry 4530	.	.	.	.
Industry 5010	-0.1528223	0.7124769	-0.21	0.830

Panel D Leverage Sub-Sample (736 Obs.)				
	Coef.	Std. Err.	z	P > |z|
Constant	-2.964881	0.7910976	-3.75	0.000
SIZE	0.3658915	0.0573097	6.38	0.000
CAPINT	-3.919044	0.430622	-9.1	0.000
Industry 1510	0.1838983	0.425392	0.43	0.666
Industry 2010	-0.5048729	0.4265041	-1.18	0.237
Industry 2020	-0.52165	0.4817153	-1.08	0.279
Industry 2030	-0.0604196	0.6418211	-0.09	0.925
Industry 2510	0.5856304	0.7431657	0.79	0.431
Industry 2520	-0.5934107	0.6730673	-0.88	0.378
Industry 2530	-1.796721	0.8569325	-2.1	0.036
Industry 2540	0.3510448	0.5832651	0.6	0.547
Industry 2550	0.5721754	0.446246	1.28	0.200
Industry 3010	0.127277	0.8198096	0.16	0.877
Industry 3020	0.7931213	0.5048564	1.57	0.116
Industry 3030	0.6657727	0.9777368	0.68	0.496
Industry 3510	-0.4505523	0.5134019	-0.88	0.380
Industry 3520	0.41946	0.7687026	0.55	0.585
Industry 4510	-0.5336203	0.5236659	-1.02	0.308
Industry 4520	0.4178096	0.5826875	0.72	0.473
Industry 4530	.	.	.	.
Industry 5010	-0.2265421	0.7168937	-0.32	0.752

Industry 5510	0.5178821	0.8283052	0.63	0.532	Industry 5510	0.4692555	0.8315327	0.56	0.573
Pseudo R-square	*0.1997*				*Pseudo R-square*	*0.2087*			
Caliper	*0.06*				*Caliper*	*0.06*			

Panel E Pre-Tax Profit Ratio Sub-Sample (557 Obs.)				
	Coef.	Std. Err.	z	P > |z|
Constant	-3.27608	0.86384	-3.79	0.000
SIZE	0.194468	0.06147	3.16	0.002
Industry 1510	0.004516	0.46234	0.01	0.992
Industry 2010	0.718368	0.41075	1.75	0.080
Industry 2020	-0.2487	0.49854	-0.50	0.618
Industry 2030	-0.08168	0.64888	-0.13	0.900
Industry 2510	1.782111	0.91018	1.96	0.050
Industry 2520	0.420384	0.6727	0.62	0.532
Industry 2530	-1.57164	0.8214	-1.91	0.056
Industry 2540	0.354628	0.62406	0.57	0.57
Industry 2550	1.816223	0.42866	4.24	0.000
Industry 3010	1.037986	0.83215	1.25	0.212
Industry 3020	0.729809	0.53712	1.36	0.174
Industry 3030	2.315463	1.17529	1.97	0.049
Industry 3510	0.847001	0.47587	1.78	0.075
Industry 3520	0.566455	0.74682	0.76	0.448
Industry 4510	0.246022	0.51595	0.48	0.633
Industry 4520	2.389191	0.66221	3.61	0.000
Industry 4530	.	.	.	.
Industry 5010	-0.109	0.69736	-0.16	0.876
Industry 5510	0.124331	0.81699	0.15	0.879

Panel F Income Tax Expense Ratio Sub-Sample (612 Obs.)				
	Coef.	Std. Err.	z	P > |z|
Constant	-3.626718	0.8073701	-4.49	0.000
SIZE	0.2340446	0.0565895	4.14	0.000
Industry 1510	0.0955095	0.4285404	0.22	0.824
Industry 2010	0.4568116	0.4081295	1.12	0.263
Industry 2020	-0.269967	0.473631	-0.57	0.569
Industry 2030	0.0373363	0.6302021	0.06	0.953
Industry 2510	1.132133	0.7710237	1.47	0.142
Industry 2520	-0.2443084	0.7587767	-0.32	0.747
Industry 2530	-1.638004	0.8253544	-1.98	0.047
Industry 2540	0.2444658	0.5927554	0.41	0.680
Industry 2550	1.644733	0.4230924	3.89	0.000
Industry 3010	0.8380712	0.8382684	1.00	0.317
Industry 3020	0.6509597	0.4996294	1.30	0.193
Industry 3030	2.189984	1.175518	1.86	0.062
Industry 3510	0.7560542	0.4784354	1.58	0.114
Industry 3520	0.5673591	0.769951	0.74	0.461
Industry 4510	-0.0630126	0.5197931	-0.12	0.904
Industry 4520	1.824372	0.5507231	3.31	0.001
Industry 4530	.	.	.	.
Industry 5010	-0.5806135	0.7599553	-0.76	0.445
Industry 5510	-0.4689733	0.91615	-0.51	0.609

Pseudo R-square	*0.1180*	*Pseudo R-square*	*0.1117*
Caliper	*0.04*	*Caliper*	*0.003*

Gross Profit Ratio is (sales revenue – cost of goods sold) / sales revenue. EBIT Ratio is (pre-tax accounting profit + interest expense) / sales revenue. Interest Expense Ratio is interest expense / sales revenue. Leverage is long-term borrowings / total assets. Pre-Tax Profit Ratio is pre-tax accounting profit / sales revenue. Income Tax Expense Ratio is income tax expense / sales revenue. SIZE is the natural logarithm of sales revenue. CAPINT is non-current assets / total assets.

6.4 Results and Discussion

6.4.1 Descriptive Statistics and Paired Sample *t*-tests

Table 6.3 presents the descriptive statistics for the six sub-samples before and after the matching, which also serves as a balancing test for the matching. The differences between FOACs and matched DOLACs on the six outcome ratios, along with reported *t*-statistics, are also presented as paired sample *t*-tests. The statistics for the industry dummy variables are not shown in the table, but are disclosed in Appendix K. It is observed that, before matching, FOACs have lower outcome ratios than do DOLACs at the 1% level, except for the Interest Expense Ratio, for which the difference is only significant at the 10% level. There are some significant differences between FOACs and DOLACs in terms of firm size, industry affiliation and capital intensity. In all of the six sub-samples, before matching, FOACs are larger in size than DOLACs, on average. For the Interest Expense Ratio and Leverage sub-samples, before matching, on average, FOACs are less capital intensive than DOLACs. Moreover, across the six sub-samples, FOACs are more prevalent than DOLACs in the Retailing industry sector (GICS code 2550) which includes distributors and wholesalers of vehicles. Meanwhile, FOACs are less prevalent than DOLACs in the Consumer Services industry sector (GICS code 2530) which includes owners and operators of hotels, restaurants and leisure, as well as providers of diversified consumer services, such as education, legal services and personal services.

Table 6.3 Descriptive Statistics

		Full (Unmatched) Sample					Propensity-Score Matched Sample			
Sub-Samples	**Variables**	**All Obs. Mean (Std. Dev.)**	**FOACs Mean (Std. Dev.)**	**DOLACs Mean (Std. Dev.)**	**%bias**	***t*-test t-statistic (P > |t|)**	**FOACs Mean (Std. Dev.)**	**DOLACs Mean (Std. Dev.)**	**%bias**	***t*-test t-statistic (P > |t|)**
Gross Profit Ratio Sub-Sample	Gross Profit Ratio	0.333	0.269	0.394	-68.3	-7.210	0.263	0.374	-60.4	-5.010
		(0.194)	(0.168)	(0.198)		(0.000)	(0.158)	(0.187)		(0.000)
	SIZE	12.229	12.699	11.780	59.5	6.260	12.490	12.616	-8.1	-0.640
		(1.618)	(1.233)	(1.806)		(0.000)	(1.190)	(1.795)		(0.520)
	No. Obs.	*448*	*219*	*229*			*122*	*122*		
	Pseudo R-square						*0.1478*			
EBIT Ratio Sub-Sample	EBIT Ratio	0.125	0.088	0.154	-57	-6.740	0.095	0.142	-39.9	-4.000
		(0.122)	(0.100)	(0.130)		(0.000)	(0.099)	(0.121)		(0.000)
	SIZE	12.490	12.705	12.316	25.4	2.980	12.587	12.847	-17	-1.590
		(1.577)	(1.172)	(1.823)		(0.003)	(1.202)	(1.854)		(0.113)
	No. Obs.	*581*	*260*	*321*			*182*	*182*		
	Pseudo R-square						*0.1120*			
Interest Expense Ratio Sub-Sample	Interest Expense Ratio	0.024	0.020	0.027	-13.9	-1.850	0.029	0.017	22.8	2.560
		(0.052)	(0.045)	(0.056)		(0.065)	(0.055)	(0.034)		(0.011)
	SIZE	12.297	12.670	12.016	41.3	5.410	12.561	12.575	-0.9	-0.090
		(1.662)	(1.195)	(1.895)		(0.000)	(1.163)	(1.956)		(0.930)
	CAPINT	0.478	0.359	0.568	-83.8	-11.430	0.477	0.474	1	0.100
		(0.267)	(0.268)	(0.229)		(0.000)	(0.257)	(0.235)		(0.917)

	No. Obs.	*741*	*319*	*422*			*202*	*202*		
	Pseudo R-square						*0.1997*			
Leverage Sub-Sample	Leverage	0.101	0.080	0.116	-25	-3.380	0.111	0.098	9	0.870
		(0.146)	(0.152)	(0.139)		(0.001)	(0.173)	(0.124)		(0.386)
	SIZE	12.301	12.677	12.020	41.4	5.400	12.601	12.493	6.8	0.650
		(1.664)	(1.197)	(1.895)		(0.000)	(1.222)	(1.985)		(0.517)
	CAPINT	0.477	0.355	0.569	-86.3	-11.730	0.482	0.466	6.5	0.670
		(0.267)	(0.266)	(0.228)		(0.000)	(0.249)	(0.226)		(0.503)
	No. Obs.	*737*	*316*	*421*			*198*	*198*		
	Pseudo R-square						*0.2087*			
Pre-Tax Profit Ratio Sub-Sample	Pre-Tax Profit Ratio	0.112	0.079	0.139	-51.8	-6.030	0.086	0.137	-44.1	-4.060
		(0.119)	(0.105)	(0.124)		(0.000)	(0.111)	(0.122)		(0.000)
	SIZE	12.511	12.725	12.338	25.3	2.910	12.639	12.853	-13.9	-1.310
		(1.570)	(1.190)	(1.805)		(0.004)	(1.220)	(1.758)		(0.189)
	No. Obs.	*558*	*250*	*308*			*174*	*174*		
	Pseudo R-square						*0.1180*			
Income Tax Expense Ratio Sub-Sample	Income Tax Expense Ratio	0.031	0.025	0.037	-29.1	-3.570	0.025	0.034	-21.3	-1.870
		(0.042)	(0.041)	(0.042)		(0.000)	(0.039)	(0.043)		(0.063)
	SIZE	12.395	12.694	12.157	34.2	4.110	12.620	12.627	-0.5	-0.040
		(1.630)	(1.192)	(1.875)		(0.000)	(1.213)	(1.854)		(0.966)
	No. Obs.	*613*	*271*	*342*			*154*	*154*		
	Pseudo R-square						*0.1117*			

Gross Profit Ratio is (sales revenue – cost of goods sold) / sales revenue. EBIT Ratio is (pre-tax accounting profit + interest expense) / sales revenue. Interest Expense Ratio is interest expense / sales revenue. Leverage is long-term borrowings / total assets. Pre-Tax Profit Ratio is pre-tax accounting profit / sales revenue. Income Tax Expense Ratio is income tax expense / sales revenue. SIZE is the natural logarithm of sales revenue. CAPINT is non-current assets / total assets.

After matching, no significant difference exists along the explanatory variables (including industry dummy variables), which indicates that the matching procedure effectively reduces the systematic differences between FOACs and DOLACs, and the resultant FOACs are reasonably comparable to DOLACs in each of the six sub-samples.

With regard to the outcome variables, FOACs are still significantly different from DOLACs in most of the outcome ratios after matching. Specifically, FOACs have lower Gross Profit Ratio and EBIT Ratio than do comparable DOLACs (0.263 versus 0.374, and 0.095 versus 0.142, respectively) and the differences are significant at the 1% level, consistent with Hypotheses 6.1A and 6.1B. The results suggest that, for every one dollar of sales revenue, FOACs generate both 11.1 cents lower gross profits and 4.7 cents lower EBITs than do comparable DOLACs, which is indicative of FOACs' being charged inflated prices for the goods or services purchased (greater costs of goods sold and greater expenses, such as management and other service fees), or charging depressed prices on the goods sold. Thus, the results lend support to the hypothesis that FOACs engage in intra-group transfer pricing to shift profits out of Australia to avoid Australian tax.[104]

Regarding thin capitalisation, FOACs have higher Interest Expense Ratio than do comparable DOLACs (0.029 versus 0.017) and the difference is significant at the 5% level, consistent with Hypothesis 6.2A. However, on average, FOACs have Leverage of 0.111, which is higher than that of comparable DOLACs (0.098), yet the difference is not statistically significant. The two findings together suggest that, in comparison with DOLACs, although FOACs incur higher interest expenses for every one dollar of sales revenue generated, they do not borrow more long-term debts to finance assets. The higher interest expenses, yet similar long-term debt levels, indicate that FOACs may be charged higher interest rates than comparable DOLACs, which is consistent with tax-induced debt shifting to allow subsidiaries in high-tax countries to claim more tax deductions for interest expense. In this case, the lender is likely to be a related party operating a low-tax country, so that the higher interest revenue is taxed at a low rate, and the group as a whole achieves tax savings.

In fact, FOACs' and DOLACs' similar levels of Leverage may be partially because of the strong cash positions of FOACs. As subsidiaries of foreign MNEs, FOACs may have

[104] It is unlikely that the identified lower Gross Profit Ratio and EBIT Ratio of FOACs can be attributable to their inefficient operations in Australia for reasons such as being unfamiliar with the local conditions. FOACs are subsidiaries of foreign MNEs that are well established and lucrative in the global market. Thus, FOACs should have ample resources to compete against Australian domestic businesses.

strong incentives to keep their after-tax profits in the host country (Australia) instead of sending them back to the parent companies. With the substantial amount of money, debt financing may not be needed. Consider U.S. MNEs as an example. As mentioned in Chapter 5, the operating profit of a foreign subsidiary of a U.S. MNE is only subject to foreign income tax unless and until it is repatriated, usually in the form of dividend payment. Upon profit repatriation, U.S. income tax liability on the foreign profit is incurred, which is generally the difference between the U.S. income tax payable as if the profit were sourced in the U.S., and the foreign tax credit for the foreign tax paid. Therefore, the U.S. income tax on the foreign profit can be indefinitely deferred if the foreign subsidiary does not repatriate profit to its U.S. parent company. Consequently, U.S. MNEs have incentives to retain their foreign subsidiaries' profits overseas. In fact, it is reported that the majority of the over US$2 trillion cash held by U.S. MNEs is held by their foreign subsidiaries (Casselman & Lahart 2011).

For this study, consider as an example Apple Pty Ltd, the Australian subsidiary of Apple Inc. It held more than AUD$363 million cash and cash equivalents by September 2012, which constituted almost 40% of the company's total assets (current assets). Foley et al. (2007) suggest that the high levels of U.S. MNEs' foreign cash holdings can be partially attributable to the U.S. repatriation tax rules. They show that affiliates located in low-tax countries hold more cash than other affiliates of the same MNEs, which can be explained by the higher tax expense that would be triggered upon earnings repatriation (Foley et al. 2007).

Further, as the Australian thin capitalisation rules specify debt limit, but not the maximum interest expense that is deductible for tax purposes, adopting highly geared structures may place FOACs in a risky position to be challenged by the tax authority. In comparison, borrowing from related parties within the limit, but with relatively high interest rates, provides an alternative way to reduce FOACs' Australian tax liabilities.

In terms of the effectiveness of FOACs' Australian tax avoidance via intra-group transfer pricing and thin capitalisation, Table 6.3 shows that FOACs have both lower Pre-Tax Profit Ratio and Income Tax Expense Ratio than do comparable DOLACs (0.086 versus 0.137, and 0.025 versus 0.034, respectively) and the differences are significant at the 1% and 10% levels, respectively. These figures suggest that, for every one dollar of sales revenue, FOACs book 5.1 cents lower pre-tax profits and incur 0.9 cent lower income tax expenses than do comparable DOLACs, consistent with Hypotheses 6.3A and 6.3B.

These findings imply that FOACs effectively shift profits out of Australia, thereby reducing their Australian tax liabilities.

The 6.3% significance level (higher than the conventional 5%) for the difference between FOACs and DOLACs in Income Tax Expense Ratio may result from the inclusion of DOLACs with up to 20% of foreign ownership among the top 20 shareholders in the sample. The results of Study 1 reported in Chapter 4 indicate that DOLACs with foreign ownership tend to engage in tax avoidance, which may reduce their overall tax liabilities.[105] Meanwhile, some FOACs might have been subject to additional tax following tax audits that identify tax shortfalls because of cross-border profit shifting. For example, Chevron Australia Holdings Pty Ltd[106] borrowed US$2.45 billion from a subsidiary in the U.S. at an interest rate of approximately 9%, yet the U.S. subsidiary raised the money by issuing commercial paper in the U.S. at an interest rate of about 1.2%. The dividends that Chevron received from the U.S. subsidiary were regarded non-assessable, non-exempt income, pursuant to Section 23AJ ITAA 36. In 2012, the Commissioner of Taxation issued amended assessments under Division 815 ITAA 97 for the 2006, 2007 and 2008 income years on the basis that the interest paid by Chevron to the U.S. subsidiary was greater than it would have been in an arm's length dealing between independent parties. The assessments were held valid by the Full Federal Court.

6.4.2 Regression Analyses

To triangulate the findings from the paired sample *t*-tests, OLS regression analyses are also performed. For each of the six sub-samples, the outcome ratio is regressed on a FOAC indicator, along with the pertinent explanatory variables. The equations below show the six OLS regression models:

$$\text{Gross Profit Ratio} = \alpha + \beta_1 \text{FOAC} + \beta_2 \text{SIZE} + \beta_{3\text{-}21} \text{IND} + \varepsilon \qquad \text{Eq. (6.9)}$$

$$\text{EBIT Ratio} = \alpha + \beta_1 \text{FOAC} + \beta_2 \text{SIZE} + \beta_{3\text{-}21} \text{IND} + \varepsilon \qquad \text{Eq. (6.10)}$$

[105] In the sample selection process, there is no restriction imposed on DOLACs' foreign operations. This is undertaken to ensure that the identified evidence for FOACs engaging in intra-group transfer pricing and thin capitalisation to shift profits out of Australia can be attributed to their strong incentives, rather than opportunities, to avoid Australia tax, as DOLACs may also have foreign operations hence opportunities to reduce Australian tax.

[106] Chevron Australia Holdings Pty Ltd v. Federal Commissioner of Taxation, 2017 FCAFC 62. Chevron is one of the FOACs in the matched sample.

$$\text{Interest Expense Ratio} = \alpha + \beta_1 \text{FOAC} + \beta_2 \text{SIZE} + \beta_3 \text{CAPINT} + \beta_{4\text{-}22} \text{IND} + \varepsilon \quad \text{Eq. (6.11)}$$

$$\text{Leverage} = \alpha + \beta_1 \text{FOAC} + \beta_2 \text{SIZE} + \beta_3 \text{CAPINT} + \beta_{4\text{-}22} \text{IND} + \varepsilon \quad \text{Eq. (6.12)}$$

$$\text{Pre-Tax Profit Ratio} = \alpha + \beta_1 \text{FOAC} + \beta_2 \text{SIZE} + \beta_{3\text{-}21} \text{IND} + \varepsilon \quad \text{Eq. (6.13)}$$

$$\text{Income Tax Expense Ratio} = \alpha + \beta_1 \text{FOAC} + \beta_2 \text{SIZE} + \beta_{3\text{-}21} \text{IND} + \varepsilon \quad \text{Eq. (6.14)}$$

Table 6.4 reports the regression results.[107] Industry dummy variables are not reported because of consideration of the length of the table. The full regression results for each of the six sub-samples are disclosed in Appendix L. It should be noted that, although firm size, industry affiliation dummy variables, and capital intensity are included in the propensity score matching logit models, they are still significant determinants of the six outcome ratios.

The regression results are consistent with those reported in Table 6.3. Specifically, in the Gross Profit Ratio sub-sample, the coefficients for the FOAC indicators are negative and significant at the 1% level, both before and after matching. In the EBIT Ratio sub-sample, the FOAC indicators are also negatively associated with EBIT Ratio and significant at the 1% level, both before and after matching. Hypotheses 6.1A and 6.1B are supported. Note that after matching, the absolute values of the coefficients for the FOAC indicators in both sub-samples increase slightly (from 0.1068 to 0.1191, and from 0.0473 to 0.0488, respectively), which implies that the matching may result in a better estimate of the effect of foreign ownership on the tax-induced intra-group transfer pricing proxies. The results indicate that, after controlling for firm size and industry affiliation, FOACs generate approximately $0.12 lower gross profit and $0.05 lower EBIT for $1 sales revenue than do DOLACs. With a mean sales revenue of AUD$1.095 billion for the Gross Profit Ratio sub-sample (after matching), and a mean sales revenue of AUD$1.429 billion for the EBIT Ratio sub-sample (after matching), an average FOAC generates about AUD$130 million lower gross profit and about AUD$70 million lower EBIT than does a comparable DOLAC.

[107] Regression analyses are also performed on samples that exclude FOACs whose propensity score is higher than the maximum or lower than the minimum propensity score of DOLACs (regressions on common support). The results are similar to those reported in Table 6.4, except the coefficient for the FOAC indicator in the Income Tax Expense Ratio sub-sample, which becomes negative and significant at the 5% level.

Table 6.4: OLS Regression Results

			Full (Unmatched) Sample				Propensity-Score Matched Sample			
Sub-Samples	**Dependent Variables**	**Variables**	**Coef.**	**Std. Err.**	**t**	**P > |t|**	**Coef.**	**Std. Err.**	**t**	**P > |t|**
Gross Profit Ratio Sub-Sample	Gross Profit Ratio	Constant	0.6857	0.0701	9.78	0.000	0.5984	0.1123	5.33	0.000
		FOAC	-0.1068	0.0173	-6.16	0.000	-0.1191	0.0201	-5.93	0.000
		SIZE	-0.0247	0.0052	-4.73	0.000	-0.0207	0.0073	-2.85	0.005
		No. Obs.	*448*				*244*			
		Adjusted R-square	*0.2827*				*0.2767*			
EBIT Ratio Sub-Sample	EBIT Ratio	Constant	0.2760	0.0413	6.68	0.000	0.2764	0.0604	4.58	0.000
		FOAC	-0.0473	0.0100	-4.73	0.000	-0.0488	0.0110	-4.44	0.000
		SIZE	-0.0054	0.0030	-1.78	0.075	-0.0056	0.0039	-1.46	0.146
		No. Obs.	*581*				*364*			
		Adjusted R-square	*0.1802*				*0.1568*			
Interest Expense Ratio Sub-Sample	Interest Expense Ratio	Constant	0.0498	0.0148	3.37	0.001	0.0381	0.0187	2.04	0.042
		FOAC	0.0121	0.0039	3.08	0.002	0.0118	0.0040	2.98	0.003
		SIZE	-0.0044	0.0011	-4.09	0.000	-0.0030	0.0014	-2.18	0.030
		CAPINT	0.0705	0.0081	8.67	0.000	0.0605	0.0101	5.97	0.000
		No. Obs.	*741*				*404*			
		Adjusted R-square	*0.2168*				*0.2571*			

Leverage Sub-Sample	Leverage	Constant	-0.3036	0.0390	-7.78	0.000	-0.2796	0.0608	-4.60	0.000
		FOAC	0.0109	0.0103	1.05	0.293	0.0060	0.0127	0.47	0.640
		SIZE	0.0165	0.0028	5.81	0.000	0.0166	0.0043	3.84	0.000
		CAPINT	0.2687	0.0215	12.47	0.000	0.2925	0.0343	8.53	0.000
		No. Obs.	*737*				*396*			
		Adjusted R-square	*0.3217*				*0.3025*			
Pre-Tax Profit Ratio Sub-Sample	Pre-Tax Profit Ratio	Constant	0.2776	0.0418	6.64	0.000	0.3737	0.0613	6.10	0.000
		FOAC	-0.0422	0.0101	-4.18	0.000	-0.0525	0.0115	-4.57	0.000
		SIZE	-0.0061	0.0031	-2.00	0.046	-0.0099	0.0041	-2.39	0.017
		No. Obs.	*558*				*348*			
		Adjusted R-square	*0.1642*				*0.2031*			
Income Tax Expense Ratio Sub-Sample	Income Tax Expense Ratio	Constant	0.0850	0.0139	6.13	0.000	0.0815	0.0211	3.86	0.000
		FOAC	-0.0079	0.0034	-2.33	0.020	-0.0079	0.0045	-1.76	0.079
		SIZE	0.0001	0.0010	0.05	0.958	-0.0003	0.0015	-0.17	0.869
		No. Obs.	*613*				*308*			
		Adjusted R-square	*0.1399*				*0.1152*			

Gross Profit Ratio is (sales revenue – cost of goods sold) / sales revenue. EBIT Ratio is (pre-tax accounting profit + interest expense) / sales revenue. Interest Expense Ratio is interest expense / sales revenue. Leverage is long-term borrowings / total assets. Pre-Tax Profit Ratio is pre-tax accounting profit / sales revenue. Income Tax Expense Ratio is income tax expense / sales revenue. SIZE is the natural logarithm of sales revenue. CAPINT is non-current assets / total assets. FOAC is an indicator which takes the value of 1 if the company is a FOAC, and 0 otherwise.

The hypothesised thin capitalisation of FOACs is partially supported by the regression results. In the Interest Expense Ratio sub-sample, the coefficients for the FOAC indicators are 0.0121 and 0.0118, respectively, significant at the 1% level, before and after matching. Hypothesis 6.2A is supported. After controlling for firm size, industry affiliation and capital intensity, FOACs incur about $0.01 higher interest expense for $1 sales revenue than do DOLACs. With a mean sales revenue of AUD$1.303 billion for the sub-sample, an average FOAC incurs about AUD$15 million higher interest expense than does a comparable DOLAC. However, in the Leverage sub-sample, the FOAC indicator is not significantly related to Leverage, with or without matching. This means that FOACs do not rely on debt financing to a greater extent than do DOLACs, after controlling for firm size, industry affiliation and capital intensity. In this sense, Hypothesis 6.2B is not supported. As discussed previously, this finding may be attributable to FOACs' strong cash positions, as they may have incentives to keep their after-tax profits in Australia, rather than sending them back to the foreign parent companies. Nevertheless, the implied higher interest rates (higher interest expenses yet similar levels of leverage) charged on FOACs are consistent with FOACs using intra-group debts at inflated interest rates to increase their tax deductions in Australia.

The regression results also largely confirm the effectiveness of FOACs' shifting profits out of Australia to reduce their Australian tax liabilities. In the Pre-Tax Profit Ratio sub-sample, the coefficients for the FOAC indicators are -0.0422 and -0.0525, respectively, significant at the 1% level, before and after matching. Hypothesis 6.3A is supported. These figures show that, after controlling for firm size and industry affiliation, compared with DOLACs, FOACs book about $0.05 lower pre-tax profit for $1 sales revenue. With a mean sales revenue of AUD$1.412 billion for the sub-sample, the above figures would be translated into AUD$74 million lower pre-tax profit for an average FOAC. In the Income Tax Expense Ratio sub-sample, the coefficients for the FOAC indicators are negative and significant at the 5% level and 10% level, respectively, before and after matching. Hypothesis 6.3B is supported. The coefficient of -0.0079 after matching means that, after controlling for firm size and industry affiliation, FOACs incur about $0.008 lower income tax expense than do DOLACs for $1 sales revenue. With a mean sales revenue of AUD$1.23 billion for the sub-sample, the above figures would be translated into about $10 million lower income tax expense for an average FOAC.

In summary, both the paired sample *t*-tests and regression analyses on the matched samples provide supporting evidence that FOACs use intra-group transfer pricing and pay

high interest rates on intra-group debts to reduce their Australian profits and subsequent Australian tax liabilities.

6.5 Robustness Checks

Although the propensity score matching effectively reduces the industry affiliation differences between FOACs and DOLACs, there are some industry sectors with only few companies in the sample. Thus, a robustness check is performed to exclude companies operating in industries with fewer than five FOACs or five DOLACs. This exclusion is implemented to help generate better matched samples, even though it results in smaller sample sizes. The following table shows the composition of the excluded 69 companies.

Table 6.5: Composition of Excluded 69 Companies

Industries	GICS codes	FOACs	DOLACs	Total
Consumer Services	2530	3	23	26
Food & Staples Retailing	3010	7	3	10
Household & Personal Products	3030	4	2	6
Semiconductors & Semiconductor Equipment	4530	0	1	1
Telecommunication Services	5010	4	13	17
Utilities	5510	3	6	9
Total		**21**	**48**	**69**

Based on the reduced sample, this section performs the same paired sample *t*-tests and regression analyses on the unmatched and matched samples as those discussed in Section 6.4. The results are presented in Appendices M and N, respectively.

The results for the paired sample *t*-tests are similar to those reported in the main test. Compared with matched DOLACs, FOACs have lower Gross Profit Ratio and EBIT Ratio, both significant at the 1% level. FOACs have higher Interest Expense Ratio, significant at the 5% level, than do matched DOLACs. No significant difference is found between matched FOACs and DOLACs in Leverage. FOACs also have lower Pre-Tax Profit Ratio than do matched DOLACs, significant at the 1% level. However, FOACs do not have significantly lower Income Tax Expense Ratio than do matched DOLACs.

The results for the OLS regression based on the reduced sample also resemble those reported in the main test. In the Gross Profit Ratio and EBIT Ratio sub-samples, the coefficients for the FOAC indicators are negative and significant at the 1% level, both before and after matching. In the Interest Expense Ratio sub-sample, before matching,

the coefficient for the FOAC indicator is positive and significant at the 1% level; after matching, the coefficient is positive and at the 5% level. In the Leverage sub-sample, the FOAC indicators are not significantly related to Leverage, before and after matching. In the Pre-Tax Profit Ratio sub-sample, the coefficients for the FOAC indicators are negative and significant at the 1% level, both before and after matching. In the Income Tax Expense Ratio sub-sample, before matching, the coefficient for the FOAC indicator is negative and significant at the 5% level; after matching, the coefficient is negative and significant at the 10% level. In summary, the robustness checks confirm the findings reported in the main test.

6.6 Limitations

This study is subject to a number of limitations. First, since FOACs do not have four-digit GICS codes readily available, coding for the industry classification is performed manually. This coding may not be precise because many companies engage in activities across multiple industries. Decisions have to be made as to which is the main industry based on the information available.

Second, the sample size is relatively small compared with other studies using the propensity score matching approach. For instance, Egger, Eggert and Winner (2010) employ a large dataset of 507,542 plants in Europe, with which they use nine explanatory variables, most of which are at region-, industry- and region-industry-level. The current study focuses on Australia only; thus, region-related explanatory variables are not relevant. However, a larger sample may result in better matching between FOACs and DOLACs.

Third, five of the six outcome ratios are scaled by sales revenue, which may be depressed by companies engaging in intra-group transfer pricing. Had the arm's length sales revenue of FOACs been available and used for the scaling, the evidence that FOACs engage in Australian tax avoidance via intra-group transfer pricing and thin capitalisation would have been even stronger.

In addition, although propensity score matching is used to address the potential endogeneity of foreign ownership, the limited number of variables employed in the logit models (first stage) means that endogeneity might remain a concern. However, the employed variables, firm size, capital intensity, and industry affiliation, are considered to be sufficient and effective in capturing the key differences between FOACs and DOLACs.

Australia is different from countries such as the U.K. and the U.S. (where most prior studies indicate that foreign ownership is endogenous), because Australia has substantial mineral resources which domestic companies are not capable of exploiting themselves. In Australia, mining companies attract the most foreign investment, with an estimated effective foreign ownership of approximately 80% (Connolly & Orsmond 2011). Bugeja (2007) shows that Australian companies receiving a foreign takeover offer are large in market capitalisation and likely operating in the resource sector. Furthermore, since a number of firm-level characteristics such as leverage and EBIT ratio are employed as the dependent variables in the OLS regression model (second stage), it is difficult to identity other firm-level characteristics that distinguish FOACs from DOLACs. Nevertheless, as the endogeneity issue may remain, the results must be interpreted to this effect.

6.7 Summary and Conclusion

The study presented in this chapter provides a further examination of the positive relationship between foreign ownership and corporate tax avoidance in the Australian dividend imputation system. Specifically, it investigates whether FOACs engage in intra-group transfer pricing and thin capitalisation to reduce their Australian tax liabilities because their shareholders cannot claim the franking credits received as tax offset.

This chapter undertakes paired sample *t*-tests using the propensity score matching technique to compare FOACs with DOLACs on six financial measures of intra-group transfer pricing and thin capitalisation. The results indicate that FOACs have lower gross profit to sales revenue ratios and lower EBIT to sales revenue ratios than do comparable DOLACs, which can be attributable to FOACs' use of intra-group transfer pricing by charging depressed prices for the goods and services supplied to related parties, or paying inflated prices for the goods and services purchased from related parties. The results also indicate that FOACs incur higher interest expenses as a percentage of sales revenue, but do not have higher leverage than comparable DOLACs. This implies that FOACs may pay high interest rates on intra-group debts to claim more tax deductions for interest expenses. The differences in the intra-group transfer pricing measures between FOACs and DOLACs are larger in absolute values than those in the thin capitalisation measures, implying that intra-group transfer pricing has a more profound effect, and thus constitutes the primary tax avoidance channel by FOACs. Further, the effectiveness of the tax avoidance activities engaged by FOACs is also evidenced in the sense that FOACs have lower pre-tax profit to sales revenue ratios, as well as lower income tax expense to sales

revenue ratios, than do comparable DOLACs. Multivariate regression analyses on the matched sample triangulate the findings from the paired sample *t*-tests.

The findings in this chapter suggest that the current Australian dividend imputation system does not interact well with foreign ownership: Australian companies with significant foreign ownership have strong incentives to avoid Australian corporate income tax. Thus, improving the current imputation system to extend the imputation benefits to foreign owners may help increase the corporate tax avoidance-reducing effect of the dividend imputation system. However, this requires foreign tax authorities to recognise Australian corporate tax paid as tax offsets in their countries, which is outside the jurisdiction of the Australian tax system.

Moreover, the findings also indicate that the Australian transfer pricing rules before 2013 may not be as effective as expected. The thin capitalisation rules before 2014 appear to be effective in limiting the gearing ratios of companies, yet companies can still claim substantial tax deductions for interest expenses if they pay high interest rates (on internal debts). Thus, future studies could investigate whether the newly introduced transfer pricing rules in Australia in 2013 help tackle cross-border tax avoidance more effectively, and consider whether the recommended 'fixed ratio approach' to deduction of interest expense by the OECD is worth adopting. The decision of the Full Federal Court in 2017 in the Chevron case confirms that transfer pricing rules can be used to tackle the non–arm's length interest rates charged on intra-group loans.

Chapter 7: Summary and Conclusion

7.1 Thesis Summary and Conclusion

For over a century, corporate profits distributed to shareholders have been subject to double taxation: first at the corporate level in the form of corporate income tax, and again at the shareholder level in the form of dividend income tax at the shareholders' personal tax rates. This double taxation has led to companies engaging in corporate tax avoidance with the aim of maximising their shareholders' after-tax returns. Prevalent tax avoidance mechanisms include taking advantage of the differences between tax rules and accounting standards to reduce tax liabilities while maintaining profit levels, and undertaking cross-border profit shifting to enable profits to be taxed at a relatively low rate.

The resultant significant losses in tax revenue from companies have raised increasing public concerns. Various rules and regulations to combat corporate tax avoidance have been introduced or proposed both at the national level and by international organisations, such as the OECD. This thesis adds to the continuing debate on how to tackle corporate tax avoidance by demonstrating how the Australian dividend imputation system alleviates corporate tax avoidance by domestic listed companies.

Australia has been operating a full dividend imputation system for decades. The system was first introduced in the country in 1987, and has been simplified and improved with a number of amendments in the subsequent years. Under the current system, Australian companies can pass Australian income tax at the corporate level to shareholders as tax credits (franking credits) by distributing franked dividends. The franking percentage is at the discretion of the companies. The amount of franking credits to be attached to dividends is normally the amount of Australian corporate income tax paid on the underlying profit. Only Australian corporate income tax can be attached to dividends as franking credits; thus, an Australian company may not be able to distribute fully franked dividends if insufficient Australian corporate income tax has been paid, perhaps because of significant foreign operations. Upon receiving franked dividends, Australian shareholders include both the amount of the dividends and the amount of the attached franking credits in their assessable income, on which they pay tax at their personal tax rates, and then claim the franking credits as tax offset. This arrangement effectively makes corporate income tax a pre-payment of shareholders' income tax, and thus does not reduce shareholders' after-tax returns on their investment. However, for foreign shareholders,

although the franked dividends they receive are not subject to withholding tax in Australia, they cannot claim the franking credits in their countries of residence as tax offset. Thus, for foreign shareholders, Australian corporate income tax reduces their after-tax returns and needs to be minimised to maximise wealth.

The dividend imputation system has changed corporate policies in terms of dividend distributions, financing choices and tax strategies. Extant studies document increased dividend payments (especially franked dividends), increased preference of equity financing over debt financing, and decreased corporate tax avoidance (less widely recognised). This thesis provides a comprehensive analysis of the corporate tax avoidance-reducing effect of the dividend imputation system in Australia. It consists of three interrelated empirical studies that are presented in Chapters 4, 5 and 6.

The first study, as reported in Chapter 4, provides an overview of the corporate tax avoidance-reducing effect of the dividend imputation system on listed Australian companies. It finds that companies distributing more franked dividends engage in less corporate tax avoidance. Franked dividend distributions allow companies to pass their corporate income tax to shareholders as franking credits, which reduce shareholders' tax liabilities. Franked dividends are demanded by Australian shareholders, especially superannuation funds which are taxed at 15% and can use the excess franking credits to reduce their tax liabilities on other income or even claim a refund. It follows that companies with Australian shareholders are willing to pay tax to frank their dividends, and thus do not have strong incentives to engage in costly corporate tax avoidance arrangements.

This study also finds that listed companies with greater foreign ownership engage in more corporate tax avoidance. Foreign shareholders cannot claim the franking credit tax offset in their countries of residence, which means that Australian corporate income tax reduces their after-tax returns and needs to be minimised to enhance their after-tax wealth.

Interestingly, this study finds no significant relationship between corporate tax avoidance and the extent of foreign operations. In other words, companies with different degrees of foreign operations have similar worldwide tax liabilities. One plausible explanation for this finding is that companies with foreign operations shift their foreign profits back to Australia (inward profit shifting) so that a greater proportion of their worldwide profits are subject to Australian tax which can be passed to shareholders as franking credits.

The additional analysis indicates that, when an Australian company with foreign ownership pays more franked dividends to meet the demands of its Australian shareholders, it tends to engage in less corporate tax avoidance.

The second study, as reported in Chapter 5, explores the insignificant relationship between foreign operations and corporate tax avoidance. It seeks further evidence on the 'inward profit shifting' of companies with foreign operations, as conjectured based on the findings in Chapter 4.

This study argues that the hypothesised 'inward profit shifting' of Australian companies is induced by the combination of the dividend imputation system and the territorial approach to tax foreign profits. The territorial approach exempts foreign profits from home country income tax in most cases, which means that a multinational company, as a consolidated group, is liable to pay foreign taxes (without additional Australian tax) on the foreign profits. In the Australian dividend imputation system, foreign taxes cannot be attached to dividends as franking credits, and thus need to be minimised to maximise shareholders' after-tax returns. Among the different methods of reducing foreign taxes, shifting foreign profits back to Australia to make them subject to Australian corporate income tax may be the most appealing method because it not only reduces foreign taxes, but also increases franking credit availability.

The findings in Chapter 5 support the 'inward profit shifting' conjecture. Specifically, this study indicates that companies with subsidiaries in low-tax countries, high-tax countries, or both have similar worldwide tax liabilities compared with their counterparts without such subsidiaries. Without shifting foreign profits to Australia, companies with subsidiaries in low-tax countries, but not high-tax countries, are expected to have lower worldwide tax liabilities, while companies with subsidiaries in high-tax countries, but not low-tax countries, are expected to have higher worldwide tax liabilities. Companies with subsidiaries in both low- and high-tax countries may have reduced worldwide tax liabilities, as they can shift profits from high- to low-tax countries. Thus, the documented similar worldwide tax liabilities across companies with or without subsidiaries in low-tax countries, high-tax countries, or both provides strong, though indirect, evidence that foreign profits are shifted to Australia.

The third study is presented in Chapter 6 and provides additional evidence on the positive relation between foreign ownership and corporate tax avoidance in the Australian dividend imputation system. Specifically, it examines whether large FOACs that are not

listed on the ASX engage in intra-group transfer pricing and thin capitalisation to shift profits out of Australia to reduce their Australian tax liabilities, as their shareholders cannot enjoy the franking credit tax offset.

In the absence of intra-group transaction data, FOACs' engagement in intra-group transfer pricing and thin capitalisation can only be revealed when compared with companies that do not have strong incentives to avoid Australian tax, such as DOLACs, as shown in Chapters 4 and 5. Based on a review of transfer pricing and thin capitalisation regulations and the ALP, this study develops six financial measures of the profit shifting activities.

The results indicate that FOACs have lower gross profit to sales revenue ratios and lower EBIT to sales revenue ratios than do comparable DOLACs, thereby suggesting that FOACs use intra-group transfer pricing to shift profits out of Australia. Moreover, FOACs also have higher interest expense to sales revenue ratios, yet similar leverage ratios than do comparable DOLACs, thereby indicating that FOACs pay high interest rates on loans from related parties to shift profits out of Australia. The lower pre-tax profit to sales revenue ratios and lower income tax expense to sales revenue ratios of FOACs compared with DOLACs imply that FOACs effectively shift profits out of Australia and reduce their Australian tax liabilities.

The overall conclusion of the thesis is that the Australian dividend imputation system has a corporate tax avoidance-reducing effect for listed companies in general. This effect is more profound for companies with a higher level of franked dividend distributions and lower level of foreign ownership. While foreign operations theoretically reduce the tax benefits provided by the imputation system, they do not appear to be an impediment because companies can shift their foreign profits to Australia.

7.2 Significance and Contribution of the Thesis to the Literature

This thesis contributes to the literature on corporate tax avoidance and dividend imputation systems in the following three ways. First, the thesis provides empirical evidence on the corporate tax avoidance-reducing effect of the dividend imputation system, thereby filling the gap in the literature on corporate tax avoidance, which is dominated by U.S. and European studies where dividend imputation has never been adopted or has been abolished. Differences in tax systems should not be overlooked when examining tax avoidance in different countries. As highlighted by Atwood et al. (2012, p.

1834), tax system characteristics should be viewed 'as determinants of differences in the availability of tax avoidance strategies, as well as determinants of differences in the expected costs and benefits of implementing tax avoidance strategies'.

This thesis shows that corporate tax avoidance behaviours in Australia differ from those in the U.S. and Europe. With the dividend imputation system, corporate tax avoidance is not prevalent among listed Australian companies, especially those distributing fully franked dividends and those without foreign ownership. For listed Australian companies with foreign operations, their tax-induced cross-border profit shifting is also distinctive: foreign profits are likely to be shifted to Australia where the corporate tax rate is relatively high. These tax avoidance and profit shifting behaviours have not been observed in the U.S. or in European countries not operating a dividend imputation system.

Second, this thesis contributes to the relatively small literature on dividend imputation systems by documenting the influence of the system on corporate tax policies. Prior studies on dividend imputation systems are mainly conducted in the field of finance and focus on the value and effect of franking credits (e.g. Brown & Clarke 1993; Cummings & Frino 2008; Walker & Partington 1999), the dividend tax clienteles effect (e.g. Bellamy 1994), and the influence of dividend imputation on corporate dividend policies and financing choices (e.g. Brown, Handley & O'Day 2015; Pattenden & Twite 2008; Twite 2001). The influence of dividend imputation on corporate tax avoidance has attracted little attention until very recently.

Compared with the handful of extant studies examining corporate tax avoidance in dividend imputation systems (e.g. Amiram, Bauer & Frank 2013; Ikin & Tran 2013; Wilkinson, Cahan & Jones 2001), this thesis is more comprehensive because it simultaneously considers the influence of franked dividend distributions, foreign operations and foreign ownership. Prior studies examine only one or two of the factors. In particular, the effect of foreign ownership on corporate tax avoidance has not been adequately addressed in the past, mainly because of paucity of data. This thesis develops a foreign ownership measure based on the top 20 shareholders' information disclosed in companies' annual reports, and by referring to the Osiris database. Moreover, the foreign operations measures employed in the thesis are potentially more comprehensive than those in prior studies (e.g. Amiram, Bauer & Frank 2013; Ikin & Tran 2013). The ratio of segment (non-current) assets located in foreign countries to total segment (non-current) assets captures different degrees of physical foreign operations, rather than merely foreign

income. Further, the categorisation of foreign subsidiary locations into low- and high-tax countries helps argue for the direction of profit shifting across countries. With the two foreign operations measures, this thesis finds supporting evidence, though indirect, for the 'inward profit shifting' of listed Australian companies with foreign operations, which explains the previously documented insignificant relation between foreign operations and corporate tax avoidance among listed Australian companies.

Third, this thesis develops a relatively clean and precise measure of corporate tax liability. The measure is 'clean' because it excludes adjustments to (current) tax expense that are attributable to the previous year(s), but are included in the current year's financial reports. The measure is 'precise' because it incorporates adjustments to the (current) tax expense of the current year, which is reported in the subsequent year's financial reports. Further, in the context of Australia in particular, this measure does not include royalty-related taxation or resource rent tax. Royalty-related taxation and resource rent tax are sometimes reported by companies as part of their income tax expense, yet theoretically should not be classified as income tax because most mining royalties are not levied on income, but are payments to state governments for access to valuable mineral deposits in Australia.

7.3 Limitations and Further Research

The limitations of this thesis mainly involve the relatively small sample sizes and the imprecise yet potentially best available measurement for some variables employed. For all three empirical studies presented in the thesis, the samples are small compared with other corporate tax avoidance studies in the literature. This is mainly because of: (1) the focus on Australia which is a small economy compared with the U.S. and EU; (2) the focus on profitable listed Australian companies (see further explanation below); (3) time constraints, given that hand-collection of data from notes to financial statements is extremely time-consuming; and (4) the high cost involved in purchasing financial reports of FOACs from the ASIC.

The focus on profitable Australian listed companies (with positive income tax expense and the computed CETR between 0 and 1) in the first two studies is necessary and consistent with other studies in the literature (e.g. Ikin & Tran 2013; Richardson & Lanis 2007, 2008). The ETR of a loss-making company is difficult to interpret because of non-positive numerator and/or denominator.

In terms of the variable measurement issues, the foreign ownership measure, foreign operations measure and industry classification for FOACs are subject to assumptions or judgement. First, despite the significant efforts devoted to collecting foreign ownership data, the foreign ownership measure constructed based on the top 20 shareholders' information is not precise. Assumptions have to be made with regard to the nationalities of some of the top 20 shareholders, as well as the percentage of foreign shareholdings among non-top 20 shareholders.

Second, the categorisation of foreign subsidiary locations into low- and high-tax countries may be imprecise in some cases. The categorisation is based on the STR of the foreign subsidiaries' countries of incorporation. Although it is noted that some countries levy different tax rates on different types of business activities, it is impossible to identify the specific business activities that a foreign subsidiary undertakes in that particular country.

Third, no four-digit GICS code is readily available for FOACs. Thus, the industry classification and coding are performed manually. As such, the classification may not be precise, as some companies engage in activities across multiple industries. Decisions have to be made as to which is the main industry, based on the information available. Presumably the same problem might also be encountered when commercial databases or the ASX assign industry codes to listed companies.

Future research may examine the corporate tax avoidance of listed companies in dividend imputation systems with a larger sample size and covering a longer period. Loss-making companies may also be investigated using alternative corporate tax avoidance measures (not ETRs). It may also be interesting to see whether the corporate tax avoidance behaviour would change when a company changes from profit-making to loss-making, or the other way around. Further, more precise measures of foreign operations and foreign ownership may be developed in future studies. In addition, to provide more direct evidence on the 'inward profit shifting' of Australian listed companies with foreign operations, obtaining data from the Australian Taxation Office may enable the separation of Australian tax and foreign tax. Accessing the subsidiary-level financial data (especially when country-by-country reporting data are available) may also help determine the direction of profit shifting.[108]

[108] Country-by-country reporting is part of the OECD standards for transfer pricing documentation. It facilitates tackling corporate tax avoidance by requiring multinational companies to report related party dealings, revenues, profits and taxes paid on jurisdiction basis, and by requiring countries to exchange

7.4 Policy Implications

The findings in the thesis have significant policy implications at both the national and international levels.

7.4.1 The Future of the Dividend Imputation System in Australia

In Australia, the dividend imputation system has been adopted for almost three decades. However, in recent tax reform discussions, the government has been considering abolishing the system on the grounds that the system introduces biases against domestic investors investing abroad, against domestic companies acquiring investments overseas, and against foreign investments into Australia.

However, abolishing the dividend imputation system may negatively affect the economy. Previous studies, such as the research by Ainsworth, Partington and Warren (2015), argue that removing the system would lead to decreased dividend payouts and thus potentially less disciplined use of equity capital, reduced share prices and increased difficulty in obtaining capital for domestic companies. The findings in the thesis proffer an important yet largely overlooked negative consequence of abolishing the system—increases in corporate tax avoidance by domestic listed companies. As discussed in this thesis, without dividend imputation, corporate income tax is a real cost that reduces shareholders' after-tax returns, thereby incentivising corporate tax avoidance. Amiram, Bauer and Frank (2013) clearly demonstrate the rise in corporate tax avoidance in countries after their dividend imputation systems were abolished. Thus, the findings in the thesis, along with the previously documented positive effect of the dividend imputation system in the literature, strongly advocate for the system to be sustained in the long term to maintain the equity of the tax system and alleviate corporate tax avoidance in Australia.

Having that said, maintaining the system does not mean keeping the system intact. In fact, the system can be improved to broaden its benefits to the Australian economy. As shown in this thesis, the current dividend imputation system does not interact well with foreign ownership—Australian companies with significant foreign ownership still have incentives to avoid Australian income tax. Thus, extending the tax benefits of the system to foreign shareholders may help broaden the system's corporate tax avoidance-reducing

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comprehensive information. Australia has implemented the OECD standards for transfer pricing documentation, which took effect from income years commencing on or after 1 January 2016 (Australian Taxation Office 2017).

effect. Nonetheless, allowing foreign shareholders of Australian companies to enjoy imputation benefits requires foreign tax authorities to recognise Australian corporate tax paid to Australian government as tax offset in their countries. This is outside the jurisdiction of the Australian tax system and it is difficult to convince foreign governments to surrender some of their tax revenue. In short, the dividend imputation system in Australia should not be abolished, but should be improved to provide greater benefits to the Australian economy.

7.4.2 Dividend Imputation System for Other Countries

The dividend imputation system is not widely adopted by countries around the world. Currently, among the OECD countries, only Australia, Canada, Chile, Mexico and New Zealand are operating a full dividend imputation system.[109] Malta, a non-OECD country, is also adopting a full dividend imputation system. Despite its narrow adoption, the dividend imputation system has existed for a long time, since it was first developed in Western Europe after World War II (Ault 1978, 1992). Many European countries had adopted the system before repealing it around 2003. The U.S. considered the system one of the ways to integrate corporate and shareholder taxes back in the 1990s, yet did not proceed with it. A brief review of history helps indicate why the dividend imputation system was abolished in several state members of the EU, and why the system could be worth adopting by EU state members again and the U.S. nowadays.

The dividend imputation system experienced vicissitude within a half-century in Europe. Since its first development in Western Europe, many European countries adopted the system, though with slight variations, until around 2003. The reason for the repeal of the system in Europe centred on the domestic favouring issue. Specifically, dividend imputation systems across countries favoured domestic investors and domestic investment. Foreign shareholders could not claim franking credits received as tax offset in their countries of residence. For resident individuals or companies investing in foreign companies, foreign income taxes paid on the foreign profits could not be attached to dividends as franking credits. This domestic preference was viewed as discrimination against foreign investors and foreign investment, and hence constituting a restriction on the ‘free movement of capital’ across member states (Commission of the European Communities 2003, p. 14 & p. 17). Although various solutions were proposed to deal

[109] As noted in Chapter 1, Canada gives tax credit for corporate income tax paid, regardless of the countries where the tax is paid.

with the domestic favouring issue, no particular solution was adopted because of the difficulty in obtaining unanimity in the EU (formerly European Community). Thus, in the wake of the adverse decision by the European Court of Justice, which found that dividend imputation violated the four freedoms in the Treaty of the EU, most European countries that had a dividend imputation system abandoned their systems by 2003 (Graetz & Warren 2006).[110]

The U.S. has never adopted a dividend imputation system. It considered dividend imputation as one of the ways to integrate corporate and shareholder taxes, though did not proceed with it. Dating back to the early 1990s, the U.S. Department of the Treasury (1992a, 1992b) discussed several approaches, including the dividend imputation system which was then referred to as the 'imputation credit prototype', to integrate corporate and shareholder taxes, yet recommended the 'dividend exclusion' approach, under which dividends would be excluded from income tax at the shareholder level (corporate profits would be taxed only once at the corporate level). In 1993, the comprehensive analysis released by the American Law Institute supported the imputation system (Warren 1993). Despite this, in 2003, the U.S. Congress decided to lower shareholder tax rate on dividends, while keeping the corporate tax rate at 35%. Thus, although dividend exclusion and dividend imputation were recommended based on intensive studies in the early 1990s, neither was enacted in the U.S. as the integration approach. More recently, in 2015, a tax reform working group of the U.S. Senate Committee on Finance reported to the Senate to discuss integration options. Instead of a dividend imputation system, the group recommended a combination of dividend paid deduction and withholding tax on dividends at the corporate level (U.S. Senate Committee on Finance 2015).

In fact, at the national level, a full dividend imputation system may offer greater benefits than other integration approaches, such as the partial imputation system and the full or partial dividend exemption. This system ensures only one layer of tax on distributed corporate profits (dividends), while maintaining corporate tax on retained earnings. Importantly, the single layer of tax is effectively levied at the shareholder level. Such shifting of taxation on corporate-sourced income from the corporate level to shareholder level results in efficiency gains and increased progressivity (Altshuler, Harris & Toder

[110] In some cases, the system had been abandoned before the court's decision. For an overview of country-specific changes away from the imputation systems in Europe, see Ainsworth (2016).

2013), as well as reduced corporate tax avoidance by domestic listed companies, as demonstrated in this thesis.

Thus, considering the substantial benefits that a full dividend imputation system can offer to a country, the system should deserve more attention in the EU, the U.S. and any other countries seeking an integration of corporate and shareholder taxes or suffering corporate tax revenue losses. For the EU in particular, instead of abandoning the imputation system, solutions to deal with the discriminatory treatment of incoming and outgoing investments of the system should be continuously debated. As will be discussed in the following subsection, a 'global' dividend imputation system or similar arrangement should be considered.

7.4.3 A Global Dividend Imputation System

The finding in the thesis that the dividend imputation system does not interact well with foreign ownership implies that a global dividend imputation system may be needed to maximise the system's benefits, especially the corporate tax avoidance-reducing effect. A global dividend imputation system allows both domestic and foreign shareholders to claim the franking credit tax offset for corporate income tax paid on the underlying profits. This system helps alleviate two problems in the current (national-level) system: discrimination against foreign investors and foreign investment (particularly an issue in the EU), and cross-border tax avoidance via profit shifting. First, since foreign shareholders can claim the franking credit tax offset, distributed corporate profits are taxed only once at the shareholder level, regardless of the shareholders' countries of residence. Moreover, as companies can pass foreign taxes to shareholders as franking credits, domestic investors' preference for domestic investment is largely reduced. As such, foreign investors and investment are not discriminated against.

Second, a global dividend imputation system can be complementary to the international corporate tax avoidance countermeasures in the OECD BEPS Action Plan. As distributed corporate profits, regardless of the source countries, are only taxed once at the shareholder level, regardless of the shareholders' countries of residence, corporate income tax on the distributed profits becomes truly a pre-payment of shareholders' personal income tax. As such, the incentive to avoid corporate income tax from the shareholders' perspective is reduced, at least partially. Consequently, corporate tax avoidance is mitigated, both domestically and internationally.

In addition, a global dividend imputation system also proffers benefits, such as increased operating efficiency, as business decisions are less likely to be made for tax reasons; increased disciplined use of capital, as managers have less opportunity to divert corporate resources for their private use; decreased reliance on debt financing; and increased capital flows across countries, just to name a few.

A global dividend imputation system can be achieved by establishing a global 'clearing-house' arrangement. The idea of this arrangement originates from that proposed by the Commission of the European Communities in 1975 to harmonise corporate taxes and dividend relief in the European Economic Community (McLure 1980). [111] The arrangement was difficult to implement in those days, but is not anymore because of the advancement in technology and the close coordination and cooperation between countries, especially members of the OECD, to combat tax avoidance via cross-border profit shifting. Some existing international organisations, such as the OECD, United Nations and World Bank, or a newly developed standalone international (world) tax organisation, as proposed by Sawyer (2006), may be capable of administering the 'clearing house'.[112]

In the global dividend imputation system, a 'clearing house' is responsible for collecting franking credits and settling the franking credit balances of all countries, thereby transferring corporate taxes paid from the source countries to the shareholders' countries of residence. Under the 'clearing-house' arrangement, a company distributing franked dividends provides vouchers to its shareholders stating the amount of tax credits that are attached to the dividends. The shareholders, in their countries of residence, can claim the stated amount of credits by submitting the vouchers with their tax returns to the tax authority. The tax authority then collects, from the clearing house, the amount of tax credits indicated on the vouchers received. The clearing house, in turn, collects the amount indicated on the voucher from the tax authority of the country in which the dividend-distributing company pays tax. Through such an arrangement, 'the source country in effect transfers the credited portion of its corporate tax to the residence country' (Cnossen 1987, p. 232). Yet the source country can still obtain corporate tax revenue from

[111] In its 1975 draft directive, the Commission of the European Communities proposed that all member states would adopt a corporate tax rate in the range of 45% to 55%, and would allow shareholders (resident in the member states) to claim 45% to 55% of the corporate tax burden on the distributed profits as tax credits.

[112] Sawyer (2006) states that the international tax organisation should not take the role of imposing tax, collecting tax or dealing with domestic tax issues. The 'clearing-house' arrangement does not contradict the role, as it merely transfers tax credits across countries.

the income generated by the subsidiary (operating and paying tax in the country), as well as income distributed from the subsidiary to the (foreign) parent company, but not redistributed to shareholders (McLure 1980).

Although cooperative efforts from countries have been called for to tackle tax avoidance via cross-border profit shifting, a global dividend imputation system has not been considered by international organisations, such as the OECD and G20 which have been working on the issue. The OECD demands cooperative efforts from countries around the world to tackle BEPS. The organisation released it BEPS Action Plan in 2013 and finalised its reports in 2015, which 'sets a clear framework for dealing with BEPS issues to develop a stronger international tax system that supports all jurisdictions in getting their fair share of tax' (Konza 2014, p. 1). G20 also target modernisation of the international tax system. In the communiqué of the 2014 Brisbane G20 Leaders' Summit, the member countries agreed on 'taking actions to ensure the fairness of the international tax system and to secure countries' revenue bases' (Group of Twenty 2014, p. 2). Among the plans and actions recommended, the main issues are more transparent disclosures by MNEs and the development of a multilateral instrument to deal with international tax matters.

With the existing extensive collaboration among countries, implementing a global dividend imputation system is feasible and probably cost saving in the long term, as fewer resources would be required to combat corporate tax avoidance after the system is implemented. However, this system may result in compromise of some benefits (tax revenue) of some countries. Thus, implementing this system would not be an easy task, yet it is still worth serious consideration.

REFERENCE LIST

Ainsworth, A 2016, 'Dividend imputation: an international experience', *JASSA*, vol. 1, pp. 58-63.

Ainsworth, A, Partington, G & Warren, G 2015, *Do franking credits matter? Exploring the financial implications of dividend imputation*, Research Working Paper No. 058/2015, Centre for International Finance and Regulation. Available from: http://apo.org.au/files/Resource/do_franking_credits_matter_-_exploring_the_financial_implications_of_dividend_imputation.pdf. [14 May 2017].

Alcock, J, Finn, F & Tan, KJK 2011, 'The determinants of debt maturity in Australian firms', *Accounting and Finance*, vol. 52, issue 2, pp. 313-341.

Altshuler, R, Harris, BH & Toder, E 2013, 'Capital income taxation and progressivity in a global economy', *Virginia Tax Review*, vol. 30, pp. 355-388.

Amiram, D, Baur, AM & Frank, MM 2013, *Corporate tax avoidance and managerial incentives generated by shareholder dividend tax policy*, Working Paper. Available from: http://www8.gsb.columbia.edu/faculty-research/sites/faculty-research/files/accounting/AMIRAM.BURTON.2013.pdf. [8 February 2015].

Antioch, G 2001, 'Franking credit trading', *Australian Tax Forum*, vol. 16, pp. 323-344.

Apelfeld, R, Fowler, GB & Gordon, JP 1996, 'Tax-aware equity investing', *The Journal of Portfolio Management*, vol. 22, no. 2, pp. 18-28.

Atwood, TJ, Drake, MS, Myers, JN & Myers, LA 2012, 'Home country tax system characteristics and corporate tax avoidance: international evidence', *The Accounting Review*, vol. 87, issue 6, pp. 1831-1860.

Ault, HJ 1978, 'International issues in corporate tax integration', *Law and Policy in International Business*, vol. 10, pp. 461-494.

Ault, HJ 1992, 'Corporate integration, tax treaties, and the division of the international tax base: principles and practices', *Tax Law Review*, vol. 47, pp. 565-608.

Austin, PC 2011, 'An introduction to propensity score methods for reducing the effects of confounding in observational studies', *Multivariate Behavioral Research*, vol. 46, pp. 399-424.

Austin, PC, Grootendorst, P & Anderson, GM 2007, 'A comparison of the ability of different propensity score models to balance measured variables between treated and untreated subjects: a Monte Carlo study', *Statistics in Medicine*, vol. 26, pp. 734-753.

Australian Taxation Office (ATO) 2015a, *ATO Submission – Inquiry into corporate tax avoidance and minimisation*, Corporate tax avoidance Submission 48, Australian Taxation Office.

Australian Taxation Office (ATO) 2015b, *Taxation Statistics 2012-13 / Companies - Table 1*. Available from: https://data.gov.au/dataset/taxation-statistics-2012-13/resource/5bfb5001-2d3c-46cb-a76d-1b86b6913ac3?inner_span=True. [22 January 2017].

Australian Taxation Office (ATO) 2017, *Country-by-Country reporting*, Australian Taxation Office. Available from: https://www.ato.gov.au/Business/International-tax-for-business/In-detail/Transfer-pricing/country-by-country-reporting/. [5 April 2017].

Avi-Yonah, RS & Benshalom, I 2011, *Formulary apportionment: myths and prospects -promoting better international policy and utilizing the misunderstood and under-theorized formulary alternative*, University of Michigan Law School, University of Michigan Law School Scholarship Repository. Available from: http://repository.law.umich.edu/cgi/viewcontent.cgi?article=2180&context=articles. [10 February 2017].

Avi-Yonah, RS 2004, 'Corporations, society, and the state: a defense of the corporate tax', *Virginia Law Review*, vol. 90, no. 5, pp. 1195-1255.

Babcock, J 2000, 'The effects of imputation systems on multinational investment, financing, and income-shifting strategies', *The Journal of the American Taxation Association*, vol. 22, issue 2, pp. 1-21.

Bankman, J 1998, 'The new market in corporate tax shelters', *Tax Notes*, vol. 83, pp. 1775-1794.

Bankman, J 2004, 'The tax shelter problem', *National Tax Journal*, vol. 57, no. 4, pp. 925-936.

Barclay, MJ & Smith, CW 1999, 'The capital structure puzzle: another look at the evidence', *Journal of Applied Corporate Finance*, vol. 12, issue 1, pp. 8-20.

Barnhouse, NC, Booth, A & Wester, K 2012, *Transfer pricing*, Working Paper. Available from: http://ssrn.com/abstract=2196826. [2 February 2017].

BBC 2013, *Starbucks pays UK corporation tax for first time since 2009*, BBC NEWS UK POLITICS. Available from: http://www.bbc.com/news/uk-politics-23019514. [29 April 2014].

Beggs, DJ & Skeels, CL 2006, 'Market arbitrage of cash dividends and franking credits', *The Economic Record*, vol. 82, no. 258, pp. 239-252.

Bellamy, DE 1994, 'Evidence of imputation clienteles in the Australian equity market', *Asia Pacific Journal of Management*, vol. 11, issue 2, pp. 275-287.

Bernard, AB, Jensen, JB & Schott, PK 2006, *Transfer pricing by U.S.-based multinational firms*, National Bureau of Economic Research, NBER Working Paper No. 12493. Available from: http://www.nber.org/papers/w12493.pdf. [2 February 2017].

Black, S & Kirkwood, J 2010, *Ownership of Australian Equities and Corporate Bonds*, Bulletin – September Quarter 2010, Reserve Bank of Australia. Available from:

http://www.rba.gov.au/publications/bulletin/2010/sep/4.html. [2 February 2017].

Blaylock, B, Shevlin, T & Wilson, RJ 2012, 'Tax avoidance, large positive temporary book-tax differences, and earnings persistence', *The Accounting Review*, vol. 87, no. 1, pp. 91-120.

Blouin, J, Huizinga, H, Laeven, L & Nicodème, G 2014, *Thin capitalization rules and multinational firm capital structure*, International Monetary Fund Working Paper WP/14/12. Available from: http://www.imf.org/external/pubs/ft/wp/2014/wp1412.pdf. [29 January 2017].

Blouin, JL, Raedy, JS & Shackelford, DA 2011, 'Dividends, share repurchases, and tax clienteles: evidence from the 2003 reductions in shareholder taxes', *The Accounting Review*, vol. 86, no. 3, pp. 887-914.

Bradbury, D 2012, *Transfer pricing laws pass the parliament*, The Treasury. Available from: http://ministers.treasury.gov.au/DisplayDocs.aspx?doc=pressreleases/2012/087.htm&pageID=003&min=djba&Year=2012&DocType=0. [26 March 2014].

Brav, A, Graham, JR, Harvey, CR & Michaely, R 2005, 'Payout policy in the 21st century', *Journal of Financial Economics*, vol. 77, issue 3, pp. 483-527.

Brookhart, MA, Schneeweiss, S, Rothman, KJ, Glynn, RJ, Avorn, J & Stürmer, T 2006, 'Variable selection for propensity score models', *American Journal of Epidemiology*, vol. 163, issue 12, pp. 1149-1156.

Brown, C, Handley, J & O'Day, J 2015. 'The dividend substitution hypothesis: Australian evidence', *Abacus*, vol. 51, issue 1, pp. 37-62.

Brown, P & Clarke, A 1993, 'The ex-dividend day behaviour of Australian share prices before and after dividend imputation', *Australian Journal of Management*, vol. 18, no. 1, pp. 1-40.

Brown, P & Walter, T 1986, 'Ex-dividend day behaviour of Australian share prices', *Australian Journal of Management*, vol. 11, issue 2, pp. 139-152.

Bruckner, P, Dews, N & White, D 1994, *Capturing value from dividend imputation*. McKinsey and Company.

Buettner, T, Overesch, M, Schreiber, U & Wamser, G 2012, 'The impact of thin-capitalization rules on the capital structure of multinational firms', *Journal of Public Economics*, vol. 96, issues 11-12, pp. 930-938.

Bugeja, M 2007, *Foreign takeovers of Australian listed entities*, University of Technology, Sydney. Available from: https://opus.lib.uts.edu.au/bitstream/10453/15876/1/2010002424.pdf. [22 April 2018].

Callen, T, Morling, S & Pleban, J 1992, *Dividends and taxation: a preliminary investigation*, Research Discussion Paper 9211, Economic Group, Reserve Bank of Australia. Available from:

https://www.rba.gov.au/publications/rdp/1992/pdf/rdp9211.pdf. [2 February 2017].

Callihan, DS 1994, 'Corporate effective tax rates: a synthesis of the literature', *Journal of Accounting Literature*, vol. 13, pp. 1-43.

Cannavan, D, Finn, F & Gray, S 2004, 'The value of dividend imputation tax credits in Australia', *Journal of Financial Economics*, vol. 73, issue 1, pp. 167-197.

Casselman, B & Lahart, J 2011, 'Companies shun investment, hoard cash', *The Wall Street Journal*, 17 September 2011. Available from: https://www.wsj.com/articles/SB10001424053111903927204576574720017009568. [2 February 2017].

Chari, A, Chen, W & Dominguez, KME 2012, 'Foreign ownership and firm performance: emerging market acquisitions in the United States', *IMF Economic Review*, vol. 60, no. 1, pp. 1-42.

Chen, K-P & Chu, CY 2005, 'Internal control versus external manipulation: a model of corporate income tax evasion', *The RAND Journal of Economics*, vol. 36, no. 1, pp. 151-164.

Chen, S, Chen, X, Cheng, Q & Shevlin, T 2010, 'Are family firms more tax aggressive than non-family firms?', *Journal of Financial Economics*, vol. 95, issue 1, pp. 41-61.

Christian, CW & Schultz, TD 2005, *ROA-based estimates of income shifting by U.S. multinational corporations*, IRS Research Bulletin. Available from: https://www.irs.gov/pub/irs-soi/05christian.pdf. [1 February 2017].

Chu, W 2011, 'Family ownership and firm performance: influence of family management, family control, and firm size', *Asia Pacific Journal of Management*, vol. 28, issue 4, pp. 833-851.

Citizens for Tax Justice 2013, *Congressional research service finds evidence of massive tax avoidance by U.S. corporations using tax havens*, Citizens for Tax Justice. Available from: http://ctj.org/ctjreports/2013/01/congressional_research_service_finds_evidence_of_massive_tax_avoidance_by_us_corporations_using_tax.php. [1 February 2017].

Clausing, KA 2003, 'Tax-motivated transfer pricing and US intrafirm trade prices', *Journal of Public Economics*, vol. 87, issues 9-10, pp. 2207-2223.

Clausing, KA 2009, 'Multinational firm tax avoidance and tax policy', *National Tax Journal*, vol. 62, no. 4, pp. 703-725.

Clausing, KA 2011, 'The revenue effects of multinational firm income shifting', *Tax Notes*, Mar. 28, 2011, pp. 1580-1586.

Cloyd, CB, Pratt, J & Stock, T 1996, 'The use of financial accounting choice to support aggressive tax positions: public and private firms', *Journal of Accounting Research*, vol. 34, no. 1, pp. 23-43.

Cnossen, S (ed) 1987, *Tax coordination in the European Community*, Springer Science & Business Media, New York, 1987.

Coleman, L, Maheswaran, K & Pinder, S 2010, 'Narratives in managers' corporate finance decisions', *Accounting and Finance*, vol. 50, issue 3, pp. 605-633.

Commission of the European Communities 2003, *Communication from the commission to the council, the European Parliament and the European Economic and Social Committee, Dividend taxation of individuals in the Internal Market*, COM (2003) 810 final, Brussels, 19 December 2003. Available from: http://publications.europa.eu/en/publication-detail/-/publication/f9f3d0cc-f0d7-4b6a-a767-7a0e33d06cfe/language-en. [2 February 2017].

Connolly, E & Orsmond, D 2011, *The mining Industry: from bust to boom*, Research Discussion Paper 2011-08, Economic Analysis Department, Reserve Bank of Australia. Available from: https://www.rba.gov.au/publications/rdp/2011/pdf/rdp2011-08.pdf. [18 March 2018].

Coulton, JJ, Ruddock, CMS & Taylor, SL 2014, 'The informativeness of dividends and associated tax credits', *Journal of Business Finance & Accounting*, vol. 41, issue 9-10, pp. 1309-1336.

Cummings, JR & Frino, A 2008, 'Tax effects on the pricing of Australian stock index futures', *Australian Journal of Management*, vol. 33, issue 2, pp. 391-406.

Davidson, S & Heaney, R 2012, 'Effective tax rates and the political cost hypothesis: a re-evaluation of Australian evidence', *Australian Tax Forum*, vol. 27, pp. 79-105.

DeAngelo, H & Masulis, RW 1980, 'Optimal capital structure under corporate and personal taxation', *Journal of Financial Economics*, vol. 8, issue 1, pp. 3-29.

Deesomsak, R, Paudyal, K & Pescetto, G 2004, 'The determinants of capital structure: evidence from the Asia Pacific region', *Journal of Multinational Financial Management*, vol. 14, issues 4-5, pp. 387-405.

Denis, DJ & Osobov, I 2008, 'Why do firms pay dividends? International evidence on the determinants of dividend policy', *Journal of Financial Economics*, vol. 89, issue 1, pp. 62-82.

Desai, MA 2003, 'The divergence between book income and tax income', *Tax Policy and the Economy*, vol. 17, pp. 169-206.

Desai, MA, Dyck, A & Zingales, L 2007, 'Theft and taxes', *Journal of Financial Economics*, vol. 84, issue 3, pp. 591-623.

Desai, MA, Foley, CF & Hines, JR 2004, 'A multinational perspective on capital structure choice and internal capital markets', *The Journal of Finance*, vol. 59, issue 6, pp. 2451-2487.

Desai, MA, Foley, CF & Hines, JR 2006, 'The demand for tax haven operations', *Journal of Public Economics*, vol. 90, issue 3, pp. 513-531.

Dhaliwal, D & Li, OZ 2006, 'Investor tax heterogeneity and ex-dividend day trading volume', *The Journal of Finance*, vol. 61, issue 1, pp. 463-490.

Dhaliwal, DS, Erickson, M & Trezevant, R 1999, 'A test of the theory of tax clienteles for dividend policies', *National Tax Journal*, vol. 52, no. 2, pp. 179-194.

Dischinger, M 2007, *Profit shifting by multinationals: indirect evidence from European micro data*, Working Paper, University of Munich. Available from: https://epub.ub.uni-muenchen.de/2029/1/dischinger_2007_profit_shifting.pdf%3Bh=repec:lmu:muenmu:2029. [11 February 2017].

Dodge, JM 1995, 'A combined mark-to-market and pass-through corporate-shareholder integration proposal', *Tax Law Review*, vol. 50, pp. 265-372

Dyreng, SD, Hanlon, M & Maydew, EL 2008, 'Long-run corporate tax avoidance', *The Accounting Review*, vol. 83, issue 1, pp. 61-82.

Egger, P, Eggert, W & Winner, H 2010, 'Saving taxes through foreign plant ownership', *Journal of International Economics*, vol. 81, issue 1, pp. 99-108.

Elliott, J & Emmanuel, C 2000, 'International transfer pricing: searching for patterns', *European Management Journal*, vol. 18, issue 2, pp. 216-222.

Elton, EJ & Gruber, MJ 1970, 'Marginal stockholder tax rates and the clientele effect', *The Review of Economics and Statistics*, vol. 52, no. 1, pp. 68-74.

European Parliament 2016, *Corporate taxation: the fight against tax avoidance*, European Parliament. Available from: http://www.europarl.europa.eu/pdfs/news/public/story/20160530STO29669/20160530STO29669_en.pdf. [31 January 2017].

Fan, JPH, Titman, S & Twite, G 2012, 'An international comparison of capital structure and debt maturity choices', *Journal of Financial and Quantitative Analysis*, vol. 47, no. 1, pp. 23-56.

Feuerherdt, C, Gray, S & Hall, J 2010, 'The value of imputation tax credits on Australian hybrid securities', *International Review of Finance*, vol. 10, issue 3, pp. 365-401.

Fleming, JC, Peroni, RJ & Shay, SE 2008, 'Some perspectives from the United States on the worldwide taxation vs. territorial taxation debate', *Journal of the Australasian Tax Teachers Association*, vol. 3, no. 2, pp. 35-86.

Foley, CF, Hartzell, JC, Titman, S & Twite, G 2007, 'Why do firms hold so much cash? A tax-based explanation', *Journal of Financial Economics*, vol. 86, issue 3, pp. 579-607.

Frank, MM, Lynch, LJ & Rego, SO 2009, 'Tax reporting aggressiveness and its relation to aggressive financial reporting', *The Accounting Review*, vol. 84, no. 2, pp. 467-496.

Gaertner, FB 2014, 'CEO after-tax compensation incentives and corporate tax avoidance', *Contemporary Accounting Research*, vol. 31, issue 4, pp. 1077-1102.

Girma, S & Görg, H 2007, 'Evaluating the foreign ownership wage premium using a difference-in-differences matching approach', *Journal of International Economics*, vol. 72, issue 1, pp. 97-112.

Goddard, J, Tavakoli, M & Wilson, JOS 2005, 'Determinants of profitability in European manufacturing and services: evidence from a dynamic panel model', *Applied Financial Economics*, vol.15, issue 18, pp. 1269-1282.

Graetz, MJ & Warren, AC 2006, 'Income tax discrimination and the political and economic integration of Europe', *The Yale Law Journal*, vol. 115, issue 6, pp. 1186-1255.

Graham, JR & Tucker, AL 2006, 'Tax shelters and corporate debt policy', *Journal of Financial Economics*, vol. 81, issue 3, pp. 563-594.

Graham, JR 2003, 'Taxes and corporate finance: a review', *The Review of Financial Studies*, vol. 16, issue 4, pp. 1075-1129.

Group of Twenty (G20) 2014, *G20 Leaders' communiqué Brisbane summit, 15-16 November 2014*, G20. Available from: http://www.mofa.go.jp/files/000059841.pdf. [10 February 2017].

Grubert, H & Mutti, J 1991, 'Taxes, tariffs and transfer pricing in multinational corporate decision making', *The Review of Economics and Statistics*, vol. 73, no. 2, pp. 285-293.

Grullon, G & Michaely, R 2002, 'Dividends, share repurchases, and the substitution hypothesis', *The Journal of Finance*, vol. 57, issue 4, pp. 1649-1684.

Guenther, DA 2014, *Measuring corporate tax avoidance: effective tax rates and book-tax differences*, Lundquist College of Business, University of Oregon, Eugene. Available from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2478952. [10 February 2017].

Guenther, DA, Matsunaga, SR & Williams, BM 2013, *Tax avoidance, tax aggressiveness, tax risk and firm risk*, Lundquist College of Business, University of Oregon, Eugene. Available from: https://business.illinois.edu/accountancy/wp-content/uploads/sites/12/2014/10/Tax-2013-Guenther.pdf. [10 February 2017].

Guo, S & Fraser, MW 2015, *Propensity Score Analysis: Statistical Methods and Applications*, 2nd edition, Los Angeles: Sage.

Gupta, S & Newberry, K 1997, 'Determinants of the variability in corporate effective tax rates: Evidence from longitudinal data', *Journal of Accounting and Public Policy*, vol. 16, issue 1, pp. 1-34.

Halperin, D 1999, 'Fundamental tax reform', *Emory Law Journal*, vol. 48, no. 3, pp. 573-588.

Hamson, D & Ziegler, P 1990, 'The impact of dividend imputation on firms' financial decisions', *Accounting and Finance*, vol. 30, issue 2, pp. 29-53.

Hanlon, M & Heitzman, S 2010, 'A review of tax research', *Journal of Accounting and Economics*, vol. 50, issues 2-3, pp. 127-178.

Hanlon, M 2005, 'The persistence and pricing of earnings, accruals, and cash flows when firms have large book-tax differences', *The Accounting Review*, vol. 80, issue 1, pp. 137-166.

Hanlon, M, Mills, LF & Slemrod, JB 2005, *An empirical examination of corporate tax noncompliance*, Ross School of Business Paper No. 1025. Available from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=891226. [13 March 2017].

Harris, MN & Feeny, S 2003, 'Habit persistence in effective tax rates', *Applied Economics*, vol. 35, issue 8, pp. 951-958.

Harris, P 2010, 'Cross-border dividend taxation in the 21st century: the (ir)relevance of tax treaties', *British Tax Review*, vol. 6, pp. 573-588.

Hathaway, N & Officer, B 2004, *The value of imputation tax credits*, Capital Research Pty Ltd. Available from: https://www.aer.gov.au/system/files/Attachment%2010-4%20Gamma%20Supporting%20Documents%20-%204%20The%20Value%20of%20Imputation%20Credits%20-%20Update%202004%20-%20November%202004.pdf. [16 December 2016].

Henry, D 2011, 'Ownership structure and tax-friendly dividends', *Journal of Banking & Finance*, vol. 35, issue 10, pp. 2747-2760.

Higgins, D, Omer, TC & Phillips, JD 2015, 'The influence of a firm's business strategy on its tax aggressiveness', *Contemporary Accounting Research*, vol. 32, issue 2, pp. 674-702.

Hines, JR & Rice, EM 1994, 'Fiscal paradise: foreign tax havens and American business', *The Quarterly Journal of Economics*, vol. 109, no. 1, pp. 149-182.

Holland, K 1998, 'Accounting policy choice: the relationship between corporate tax burdens and company size', *Journal of Business Finance & Accounting*, vol. 25 issue 3-4, pp. 265-288.

Hoopes, JL, Mescall, D & Pittman, JA 2012, 'Do IRS audits deter corporate tax avoidance?', *The Accounting Review*, vol. 87, issue 5, pp. 1603-1639.

Howard, PF & Brown, RL 1992, 'Dividend policy and capital structure under the imputation tax system: some clarifying comments', *Accounting & Finance*, vol. 32, issue 1, pp. 51-61.

Huizinga, H & Laeven, L 2008, 'International profit shifting within multinationals: a multi-country perspective', *Journal of Public Economics*, vol. 92, issues 5-6, pp. 1164-1182.

Huizinga, H, Laeven, L & Nicodeme, G 2008, 'Capital structure and international debt shifting', *Journal of Financial Economics*, vol. 88, issue 1, pp. 80-118.

Huseynov, F & Klamm, BK 2012, 'Tax avoidance, tax management and corporate social responsibility', *Journal of Corporate Finance*, vol. 18, issue 4, pp. 804-827.

Ikin, C & Tran, A 2013, 'Corporate tax strategy in the Australian dividend imputation system', *Australian Tax Forum*, vol. 28, issue 3, pp. 523-553.

Jackson, M 2009, *Book-tax differences and earnings growth*, Unpublished Ph.D. dissertation, University of Oregon. Available from: https://scholarsbank.uoregon.edu/xmlui/bitstream/handle/1794/10224/Jackson_Mark_phd2009sp.pdf;sequence=1. [15 May 2017].

Joos, P, Pratt, J & Young, D 2000, *Book-tax differences and the value relevance of earnings*, Working Paper, Massachusetts Institute of Technology, Indiana University and Insead.

Jun, A, Gallagher, DR & Partington, GH 2011, 'Institutional dividend clienteles under an imputation tax system', *Journal of Business Finance & Accounting*, vol. 38, issue 1-2, pp. 198-224.

Kalay, A 1982, 'The ex-dividend day behaviour of stock prices: a re-examination of the clientele effect', *The Journal of Finance*, vol. 37, issue 4, pp. 1059-1070.

Keuschnigg, C & Devereux, MP 2013, 'The arm's length principle and distortions to multinational firm organization', *Journal of International Economics*, vol. 89, issue 2, pp. 432-440.

Klassen, KJ, Laplante, SK & Carnaghan, C 2014, 'A model of multinational income shifting and an application to tax planning with e-commerce', *The Journal of the American Taxation Association*, vol. 36, issue 2, pp. 27-53.

Konza, M 2014, *BEPS action plan update*, Tax Institute NSW 7th Annual Tax Forum, Dalton House Sydney, Australian Tax Office. Available from: https://www.ato.gov.au/Media-centre/Speeches/Other/BEPS-Action-Plan-Update/. [31 January 2017].

KPMG 2016, *Corporate tax rates table*, KPMG. Available from: https://home.kpmg.com/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online/corporate-tax-rates-table.html. [31 January 2017].

Lakonishok, J & Vermaelen, T 1983, 'Tax reform and ex-dividend day behaviour', *The Journal of Finance*, vol. 38, issue 4, pp. 1157-1179.

Lasfer, MA 1996, 'Taxes and dividends: the UK evidence', *Journal of Banking & Finance*, vol. 20, issue 3, pp. 455-472.

Lawrence, A, Minutti-Meza, M & Zhang, P 2011, 'Can Big-4 versus non-Big 4 differences in audit-quality proxies be attributed to client characteristics?', *The Accounting Review*, vol. 86, no. 1, pp. 259-286.

Lennox, C, Lisowsky, P & Pittman, J 2013, 'Tax aggressiveness and accounting fraud', *Journal of Accounting Research*, vol. 51, issue 4, pp. 739-778.

Li, EX & Tran, AV 2016, 'An empirical analysis of the tax burden of mining firms versus non‐mining firms in Australia', *Australian Tax Forum*, vol. 31, no. 1, pp. 167-203.

Lintner, J 1956, 'Distribution of incomes of corporations among dividends, retained earnings and taxes', *The American Economic Review*, vol. 46, no. 2, pp. 97-113.

Lisowsky, P 2010, 'Seeking shelter: empirically modelling tax shelters using financial statement information', *The Accounting Review*, vol. 85, no. 5, pp. 1693-1720.

Lisowsky, P, Robinson, L & Schmidt, A 2013, 'Do publicly disclosed tax reserves tell us about privately disclosed tax shelter activity?', *Journal of Accounting Research*, vol. 51, issue 3, pp. 583-629.

Mackenzie, G & McKerchar, M 2014, 'Tax-aware investment management by public offer superannuation funds in Australia: attitudes, practices and expectations', *Australian Tax Forum*, vol. 29, pp. 249-279.

Manzon, GB & Plesko, GA 2002, 'The relation between financial and tax reporting measures of income', *Tax Law Review*, vol. 55, pp. 175-214.

Markle, K 2016, 'A comparison of the tax-motivated income shifting of multinationals in territorial and worldwide countries', *Contemporary Accounting Research*, vol. 33, issue 1, pp. 7-43.

Markle, KS & Shackelford, DA 2012, 'Cross-country comparisons of the effects of leverage, intangible assets, and tax havens on corporate income taxes', *Tax Law Review*, vol. 65, pp. 415-432.

McClure, R, Lanis, R & Govendir, B 2016, *Analysis of tax avoidance strategies of top foreign multinationals operating in Australia: an expose*, University of Technology Sydney. Available from: http://cdn.getup.org.au/1507-Aggressive-Tax-Avoidance-By-Top-Foreign-Multinations.pdf. [31 January 2017].

McGill, GA & Outslay, E 2004, 'Lost in translation: detecting tax shelter activity in financial statements', *National Tax Journal*, vol. 57, no. 3, pp. 739-756.

McLure, CE 1980, 'International aspects of dividend relief', *The Journal of Corporate Taxation*, vol. 7, no. 2, pp. 137-162.

Melia, A, Docherty, P & Easton, S 2016, 'Net share issues and the cross-section of equity returns under a dividend imputation tax system', *Accounting and Finance*, vol. 56, issue 4, pp. 1097-1117.

Merlo, V & Wamser, G 2014, 'Debt shifting and thin-capitalization rules', *DICE Report*, vol. 12, issue 4, pp. 27-31.

Miller, MH & Modigliani, F 1961, 'Dividend policy, growth, and the valuation of shares', *The Journal of Business*, vol. 34, no. 4, pp. 411-433.

Miller, MH & Scholes, MS 1978, 'Dividends and taxes', *Journal of Financial Economics*, vol. 6, issue 4, pp. 333-364.

Mills, L, Erickson, MM & Maydew, EL 1998, 'Investments in tax planning', *The Journal of American Taxation Association*, vol. 20, no. 1, pp. 1-20.

Mills, LF & Newberry, KJ 2001, 'The influence of tax and nontax costs on book-tax reporting differences: public and private firms', *The Journal of American Taxation Association*, vol. 23, no. 1, pp. 1-19.

Mills, LF & Newberry, KJ 2004, 'Do foreign multinationals' tax incentives influence their U.S. income reporting and debt policy?', *National Tax Journal*, vol. 57, no. 1, pp. 89-107.

Mills, LF, Newberry, KJ & Trautman, WB 2002, 'Trends in book-tax income and balance sheet differences', *Tax Notes*, vol. 96, no. 8, pp. 1109-1124.

Mirrlees, J, Adam, S, Besley, T, Blundell, R, Bond, S, Chote, R, Gammie, M, Johnson, P, Myles, G & Poterba, JM 2011, 'Chapter 17 Taxing corporate income' in *Tax by design*, pp. 406-428. Oxford University Press. Available from: https://www.ifs.org.uk/uploads/mirrleesreview/design/ch17.pdf. [10 February 2017].

Monkhouse, PHL 1993, 'The cost of equity under the Australian dividend imputation tax system', *Accounting & Finance*, vol. 33, issue 2, pp. 1-18.

Musgrave, RA & Musgrave, PB 1989, *Public Finance in Theory and Practice*, 5th edition, McGraw-Hill Book Co, pp. 372-373.

Myers, SC & Majluf, NS 1984, 'Corporate financing and investment decisions when firms have information that investors do not have', *Journal of Financial Economics*, vol. 13, no. 2, pp. 187-211

Myers, SC 1984, 'The capital structure puzzle', *The Journal of Finance*, vol. 39, issue 3, pp. 574-592.

Nigol, REG 1992, 'The dividend puzzle: an Australian solution?', *Australian Accounting Review*, vol. 1, issue 4, pp. 42-55.

OECD 2012, *Thin capitalisation legislation a background paper for country tax administrations*, OECD. Available from: http://www.oecd.org/ctp/tax-global/5.%20thin_capitalization_background.pdf. [10 February 2017].

OECD 2013, *Addressing base erosion and profit shifting*, OECD Publishing, Paris. Available from: http://dx.doi.org/10.1787/9789264192744-en. [4 February 2017].

OECD 2014, *Model tax convention on income and on capital 2014 (Full Version)*, OECD Publishing, Paris. Available from: http://www.oecd-ilibrary.org/docserver/download/2315271e.pdf?expires=1485578862&id=id&accname=ocid194734&checksum=578AEE3548A6F2CD6A43834175B010BB. [10 February 2017].

OECD 2015, *Limiting base erosion involving interest deductions and other financial payments, Action 4 - 2015 Final Report*, OECD Publishing, Paris. Available from: http://www.oecd.org/tax/limiting-base-erosion-involving-interest-deductions-and-other-financial-payments-action-4-2015-final-report-9789264241176-en.htm. [13 March 2017].

Omer, TC, Molloy, KH & Ziebart, DA 1993, 'An investigation of the firm size-effective tax rate relation in the 1980s', *Journal of Accounting, Auditing & Finance*, vol. 8, issue 2, pp. 167-182.

Parliament of Australia 2015, *Corporate tax avoidance part 1: you cannot tax what you cannot see*, The Senate Economics References Committee, Commonwealth of Australia. Available from: http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Economics/Corporate_Tax_Avoidance/Report_part_1. [13 March 2017].

Pattenden, K & Twite, G 2008, 'Taxes and dividend policy under alternative tax regimes', *Journal of Corporate Finance*, vol. 14, issue 1, pp. 1-16.

Pattenden, K 2006, 'Capital structure decisions under classical and imputation tax systems: a natural test for tax effects in Australia', *Australian Journal of Management*, vol. 31, issue 1, pp. 67-92.

Phillips, JD 2003, 'Corporate tax-planning effectiveness: the role of compensation-based incentives', *The Accounting Review*, vol. 78, no. 3, pp. 847-874.

Polito, AP 1989, 'A proposal for an integrated income tax', *Harvard Journal of Law & Public Policy*, vol. 12, pp. 1009-1048.

Pontiff, J & Woodgate, A 2008, 'Share issuance and cross-sectional returns', *The Journal of Finance*, vol. 63, issue 2, pp. 921-945.

Porter, ME 1980, 'Industry structure and competitive strategy: keys to profitability', *Financial Analysts Journal*, vol. 36, no. 4, pp. 30-41.

Rego, SO & Wilson, R 2012, 'Equity risk incentives and corporate tax aggressiveness', *Journal of Accounting Research*, vol. 50, issue 3, pp. 775-810.

Rego, SO 2003, 'Tax-avoidance activities of U.S. multinational corporations', *Contemporary Accounting Research*, vol. 20, issue 4, pp. 805-833.

Richardson, D 2015, *Corporate tax avoidance*, Submission 62, ISSN 1836-8948, The Australia Institute. Available from: http://www.tai.org.au/sites/defualt/files/corporate%20tax%20avoidance%20Submission.pdf. [31 January 2017].

Richardson, G & Lanis, R 2007, 'Determinants of the variability in corporate effective tax rates and tax reform: evidence from Australia', *Journal of Accounting and Public Policy*, vol. 26, issue 6, pp. 689-704.

Richardson, G & Lanis, R 2008, 'Corporate effective tax rates and tax reform: evidence spanning Australia's Ralph Review of Business Taxation Reform', *Australian Tax Forum*, vol. 23, pp. 109-123.

Rosenbaum, PR & Rubin, DB 1983, 'The central role of the propensity score in observational studies for causal effects', *Biometrika*, vol. 70, no. 1, pp. 41-55.

Sawyer, A 2006, 'Developing an international (world) tax organisation for administering binding rulings and APAs - the way forward', *Australian Tax Forum*, vol. 21, pp. 287-330.

Scholes, MS & Wolfson, MA 1992, *Taxes and business strategy: a planning approach*, Englewood Cliffs, N.J.: Prentice Hall.

Shevlin, T & Porter, S 1992, '"The corporate tax comeback in 1987": some further evidence', *The Journal of the American Taxation Association*, vol. 14, issue 1, pp. 58-79.

Shipman, JE, Swanquist, QT & Whited, RL 2017, 'Propensity score matching in accounting research', *The Accounting Review*, vol. 92, no. 1, pp. 213-244.

Shyam-Sunder, L & Myers, SC 1999, 'Testing static tradeoff against pecking order models of capital structure', *Journal of Financial Economics*, vol. 51, issue 2, pp. 219-244.

Siegfried, JJ 1972, *The relationship between economic structure and the effect of political influence: empirical evidence from the Corporation Income Tax Program*, Ph.D. Dissertation, University of Wisconsin.

Skinner, DJ 2008, 'The evolving relation between earnings, dividends, and stock repurchases', *Journal of Financial Economics*, vol. 87, issue 3, pp. 582-609.

Slemrod, J & Yitzhaki, S 2002, 'Chapter 22 – tax avoidance, evasion, and administration' in AJ Auerbach & M Feldstein, (eds), *Handbook of Public Economics*, vol. 33, pp. 1423-1470.

Slemrod, J 2004, 'The economics of corporate tax selfishness', *National Tax Journal*, vol. 57, issue 4, pp. 877-899.

Stickney, CP & McGee, VE 1982, 'Effective corporate tax rates the effect of size, capital intensity, leverage, and other factors', *Journal of Accounting and Public Policy*, vol. 1, issue 2, pp. 125-152.

Sullivan, M 2008, 'U.S. multinationals shifting profits out of the United States', *Tax Notes*, Mar. 10, 2008, pp. 1078-1082.

Sullivan, M 2010, 'Transfer pricing costs U.S. at least $28 billion', *Tax Notes*, Mar. 22, 2010, pp. 1439-1443.

Taylor, G & Richardson, G 2012, 'International corporate tax avoidance practices: evidence from Australian firms', *The International Journal of Accounting*, vol. 47, issue 4, pp. 469-496.

Teck, TH 2006, 'Assessing the impact of Singapore's move to the one-tier corporate tax system on shareholders', *International Tax Journal*, vol. 32, pp. 19-28.

The Treasury 2013, *Scoping paper on risks to the sustainability of Australia's corporate tax base Chapter 3 Corporate and international income tax in*

Australia, The Treasury. Available from: http://www.treasury.gov.au/PublicationsAndMedia/Publications/2013/Aus-Corporate-Tax-Base-Sustainability/HTML/Chapter-3. [10 February 2017].

Ting, A 2014, 'iTax – Apple's international tax structure and the double non-taxation issue', *British Tax Review*, 2014 no. 1, pp. 40-71. Available from: http://papers.ssrn.com/sol3/Papers.cfm?abstract_id=2411297. [4 April 2014].

Titman, S & Wessels, R 1988, 'The determinants of capital structure choice', *The Journal of Finance*, vol. 43, issue 1, pp. 1-19.

Tran, A & Yu, YH 2008, 'Effective tax rates of corporate Australia and the book-tax income gap', *Australian Tax Forum*, vol. 23, no. 3, pp. 233-268.

Tran, AV 1997, 'The gap between accounting profit and taxable income', *Australian Tax Forum*, vol. 13, pp. 507-534.

Trezevant, R 1992, 'Debt financing and tax status: tests of the substitution effect and the tax exhaustion hypothesis using firms' responses to the Economic Recovery Tax Act of 1981', *The Journal of Finance*, vol. 47, issue. 4, pp. 1557-1568.

Twite, G 2001, 'Capital structure choices and taxes: evidence from the Australian dividend imputation tax system', *International Review of Finance*, vol. 2, issue 4, pp. 217-234.

U.S. Department of the Treasury 1992a, *Report of the Department of the Treasury on integration of the individual and corporate tax systems: taxing business income once*, The U.S. Department of the Treasury, Washington, DC. Available from: https://www.treasury.gov/resource-center/tax-policy/Documents/Report-Integration-1992.pdf. [6 February 2017].

U.S. Department of the Treasury 1992b, *A recommendation for integration of the individual and corporate tax systems*, The U.S. Department of the Treasury, Washington, DC. Available from: https://www.treasury.gov/resource-center/tax-policy/Documents/Report-Recommendation-Integration-1992.pdf. [6 February 2017].

U.S. Department of the Treasury 1999, *The problem of corporate tax shelters discussion, analysis and legislative proposals*, The U.S. Department of the Treasury, Washington, DC. Available from: https://www.treasury.gov/resource-center/tax-policy/Documents/Report-Corporate-Tax-Shelters-1999.pdf. [6 February 2017].

U.S. Senate Committee on Finance 2015, *Report of the business income taxation working group to the United States Senate Committee on Finance*, U.S. Senate, Committee on Finance, Washington, DC. Available from: https://www.finance.senate.gov/imo/media/doc/The%20Business%20Income%20Bipartisan%20Tax%20Working%20Group%20Report.pdf. [4 February 2017].

Walker, S & Partington, G 1999, 'The value of dividends: evidence from cum-dividend trading in ex-dividend period', *Accounting and Finance*, vol. 39, issue 3, pp. 275-296.

Warren, AC 1993, *Reporter's study of corporate tax integration*, American Law Institute, Federal Income Tax Project, Integration of the individual and corporate income taxes, Washington, DC.

Watts, RL & Zimmerman, JL 1978, 'Towards a positive theory of the determination of accounting standards', *The Accounting Review*, vol. 53, no. 1, pp. 112-134.

Weber, DP 2009, 'Do analysts and investors fully appreciate the implications of book-tax differences for future earnings?', *Contemporary Accounting Research*, vol. 26, issue 4, pp. 1175-1206.

Wilkie, PJ & Limberg, ST 1993, 'Measuring explicit tax (dis)advantage for corporate taxpayers: an alternative to average effective tax rates', *The Journal of the American Taxation Association*, vol. 15, issue 1, pp. 46-71.

Wilkie, PJ 1988, 'Corporate average effective tax rates and inferences about relative tax preferences', *The Journal of the American Taxation Association*, vol. 10, issue 1, pp. 75-88.

Wilkinson, BR, Cahan, SF & Jones, G 2001, 'Strategies and dividend imputation: the effect of foreign and domestic ownership on average effective tax rates', *Journal of International Accounting, Auditing and Taxation*, vol. 10, issue 2, pp. 157-175.

Wilson, RJ 2009, 'An examination of corporate tax shelter participants', *The Accounting Review*, vol. 84, no. 3, pp. 969-999.

Woellner, RH, Barkoczy, S, Murphy, S, Evans, C & Pinto, D 2013, *Australian Taxation Law*, 23rd edition, CCH, Sydney.

Wood, J 1997, 'A simple model for pricing imputation tax credits under Australia's dividend imputation tax system', *Pacific-Basin Finance Journal*, vol. 5, issue 4, pp. 465-480.

Xian, C, Sun, F & Zhang, Y 2015, 'Book-tax difference: are they affected by equity-based compensation?', *Accounting Research Journal*, vol. 28, issue 3, pp. 300-318.

Zimmerman, JL 1983, 'Taxes and firm size', *Journal of Accounting and Economics*, vol. 5, pp. 119-149.

APPENDICES

Appendix A

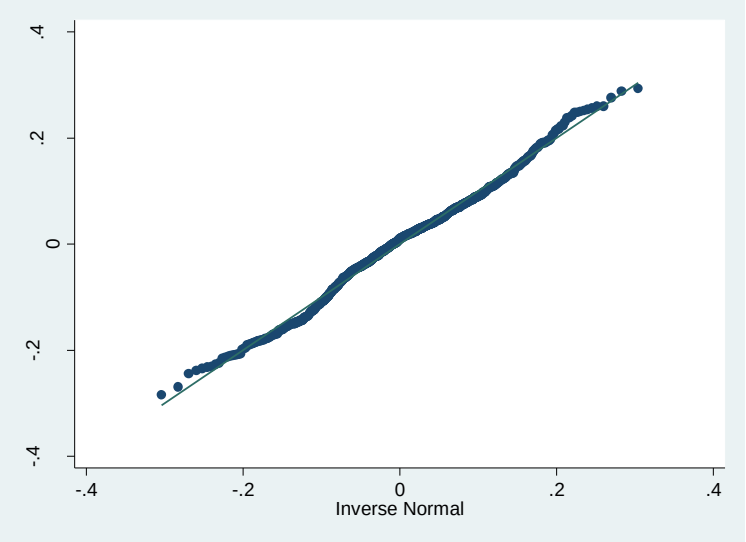
For the main test in Chapter 4, regression diagnostic tests are performed to ensure that the underlying assumptions of the OLS regression are met.

A quantile-quantile (Q-Q) plot is presented to check for normal distribution of residuals. It is observed that the Q-Q plot points largely form a linear line matching the line passing through the origin with a unit slope, albeit slight deviations at the two ends. Thus, the assumption regarding the normal distribution of residuals is considered as not violated.

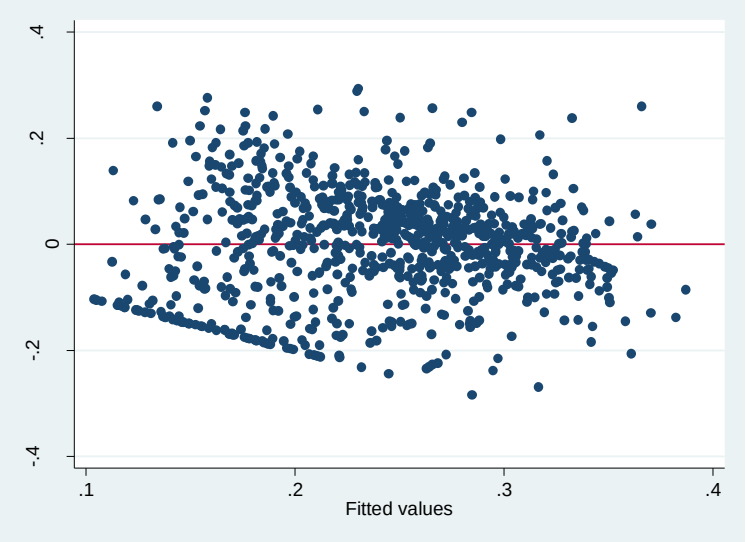
In the residual versus the fitted value plot, data points are scattered randomly around the horizontal ‘zero’ line and roughly form a horizontal band around the ‘zero’ line, suggesting that the linearity assumption and the homoscedasticity assumption are largely met. Other than the slightly narrowed range towards the left end and the slight concentration around the fitted value between 0.2 and 0.3, there is no noticeable pattern of the data points. In fact, the downward sloping bottom line is caused by the removal of firm-year observations with non-positive CETR, and the concentration around 0.3 is because of the STR of 30%

The Durbin-Watson statistic is estimated as 2.03834, indicating no autocorrelation in the sample.

Q-Q Plot



Residual versus Fitted Value Plot



Multicollinearity is checked by computing the variance inflation factors of variables (VIFs) in the model. The results are present in the table below. Since none of the VIFs is greater than 1.5 for variables other than the industry and year dummy variables, and none of the VIFs of the industry and year dummy variable exceeds 3.2, multicollinearity is not a problem.

Variables	VIF	1/VIF
FDD	1.44	0.69518
FOW	1.20	0.83203
FOP	1.28	0.78025
SIZE	1.32	0.76030
Industry 1510	2.73	0.36676
Industry 2010	3.11	0.32183
Industry 2020	2.34	0.42675
Industry 2030	1.49	0.67050
Industry 2510	1.13	0.88412
Industry 2520	1.72	0.58302
Industry 2530	2.00	0.49982
Industry 2540	1.63	0.61441
Industry 2550	2.53	0.39584
Industry 3010	1.30	0.77199
Industry 3020	1.56	0.64196
Industry 3030	1.14	0.87984
Industry 3510	1.74	0.57352
Industry 3520	1.31	0.76354
Industry 4510	2.32	0.43073
Industry 4520	1.27	0.79049
Industry 4530	1.06	0.94397
Industry 5010	1.51	0.66284
Year 2010	1.49	0.67064
Year 2011	1.48	0.67761
Year 2012	1.48	0.67443

CETR is calculated as (current income tax expense + tax adjustment – royalties and resource rent tax) / pre-tax accounting profit before share of associates' profit or loss. FDD is calculated as (interim dividend × franking percentage+ final dividend × franking percentage + special dividend × franking percentage) / after-tax accounting profit excluding the amount attributable to non-controlling interest. FOW is calculated as the percentage of identified foreign shareholdings divided by the total percentage of the top 20 shareholdings. FOP is calculated as the ratio of segment (non-current) assets located in foreign countries to total segment (non-current) assets. SIZE is the natural logarithm of sales revenue. The sample consists of 862 firm-year observations, after excluding 26 observations with standard deviations of residuals greater than 3 or smaller than -3.

Appendix B

The following table shows the regression results for the original model in Chapter 4, before excluding observations with standardised residuals greater than 3 or smaller than -3. There are 888 firm-year observations. The adjusted R-square is 0.1095. The F-statistic is 5.36.

Variables	Coef.	Std. Err.	t	P > |t|
FDD	0.0980808	0.0163773	5.99	0.000
FOW	-0.075827	0.0295068	-2.57	0.010
FOP	0.008096	0.0176863	0.46	0.647
SIZE	0.0079397	0.0027012	2.94	0.003
Industry 1510	0.009685	0.021033	0.46	0.645
Industry 2010	0.0200547	0.0206773	0.97	0.332
Industry 2020	0.0327292	0.0226864	1.44	0.149
Industry 2030	0.0033731	0.0305303	0.11	0.912
Industry 2510	-0.0023714	0.0518016	-0.05	0.963
Industry 2520	0.0647288	0.02686	2.41	0.016
Industry 2530	0.0022526	0.0249981	0.09	0.928
Industry 2540	0.0259198	0.0289465	0.90	0.371
Industry 2550	0.0272728	0.0230082	1.19	0.236
Industry 3010	-0.0355515	0.046459	-0.77	0.444
Industry 3020	-0.0411806	0.0288787	-1.43	0.154
Industry 3030	0.0336075	0.0519127	0.65	0.518
Industry 3510	0.0288747	0.0257601	1.12	0.263
Industry 3520	-0.0326381	0.0349019	-0.94	0.350
Industry 4510	-0.0290693	0.0234788	-1.24	0.216
Industry 4520	0.0372146	0.0388274	0.96	0.338
Industry 4530	0.011193	0.0764699	0.15	0.884
Industry 5010	0.0287936	0.0298258	0.97	0.335
Year 2010	-0.0262646	0.0120262	-2.18	0.029
Year 2011	-0.0117565	0.0123683	-0.95	0.342
Year 2012	-0.0260617	0.0123089	-2.12	0.035
Constant	0.0689824	0.0539052	1.28	0.201

The regression model is: $\mathrm{CETR} = \alpha + \beta_1 \mathrm{FDD} + \beta_2 \mathrm{FOW} + \beta_3 \mathrm{FOP} + \beta_4 \mathrm{SIZE} + \beta_{5\text{-}22} \mathrm{IND} + \beta_{23\text{-}25} \mathrm{YEAR} + \varepsilon$.

CETR is calculated as (current income tax expense + tax adjustment – royalties and resource rent tax) / pre-tax accounting profit before the share of associates' profit or loss. FDD is calculated as (interim dividend × franking percentage + final dividend × franking percentage + special dividend × franking percentage) / after-tax accounting profit excluding the amount attributable to non-controlling interest. FOW is calculated as the percentage of foreign shareholdings / total percentage of the top 20 shareholdings. FOP is calculated as segment (non-current) assets located in foreign countries / total segment (non-current) assets. SIZE is the natural logarithm of sales revenue.

Appendix C

The table shows the regression results for the original model with revised foreign ownership and foreign operations measures in Chapter 4. There are 862 observations, after excluding those with standardised residuals greater than 3 or smaller than -3. The adjusted R-square is 0.2321. The F-statistic is 11.41.

Variables	Coef.	Std. Err.	t	P > |t|
FDD	0.1360356	0.0131766	10.32	0.000
FOW-R	-0.0481035	0.0229159	-2.10	0.036
FOP-R	0.0032963	0.0140715	0.23	0.815
SIZE	0.0083024	0.0021492	3.86	0.000
Industry 1510	0.0079279	0.0168353	0.47	0.638
Industry 2010	0.0062692	0.0166678	0.38	0.707
Industry 2020	0.0298473	0.0181879	1.64	0.101
Industry 2030	0.0132606	0.0242086	0.55	0.584
Industry 2510	0.0087933	0.0409053	0.21	0.830
Industry 2520	0.0557821	0.0214598	2.60	0.010
Industry 2530	-0.0001909	0.0199877	-0.01	0.992
Industry 2540	0.0320543	0.0228767	1.40	0.162
Industry 2550	0.032122	0.0182986	1.76	0.080
Industry 3010	-0.0418509	0.0365887	-1.14	0.253
Industry 3020	-0.04038	0.0231312	-1.75	0.081
Industry 3030	0.0394149	0.0409978	0.96	0.337
Industry 3510	0.027287	0.020727	1.32	0.188
Industry 3520	-0.0142368	0.0275938	-0.52	0.606
Industry 4510	-0.025512	0.0187794	-1.36	0.175
Industry 4520	0.0464423	0.0306872	1.51	0.131
Industry 4530	0.0277346	0.0603159	0.46	0.646
Industry 5010	0.0284289	0.0239257	1.19	0.235
Year 2010	-0.0294558	0.0095815	-3.07	0.002
Year 2011	-0.0198561	0.009878	-2.01	0.045
Year 2012	-0.029968	0.0098297	-3.05	0.002
Constant	0.0386292	0.0430058	0.90	0.369

The regression model is: $\text{CETR} = \alpha + \beta_1 \text{FDD} + \beta_2 \text{FOW-R} + \beta_3 \text{FOP-R} + \beta_4 \text{SIZE} + \beta_{5\text{-}22} \text{IND} + \beta_{23\text{-}25} \text{YEAR} + \varepsilon$.

CETR is calculated as (current income tax expense + tax adjustment – royalties and resource rent tax) / pre-tax accounting profit before the share of associates' profit or loss. FDD is calculated as (interim dividend × franking percentage + final dividend × franking percentage + special dividend × franking percentage) / after-tax accounting profit excluding the amount attributable to non-controlling interest. FOW-R is calculated as (the percentage of foreign shareholdings + the percentage of New Zealand shareholdings) / total percentage of the top 20 shareholdings. FOP-R is calculated as the segment (non-current) assets

located in foreign countries and New Zealand / total segment (non-current) assets. SIZE is the natural logarithm of sales revenue.

Appendix D

The following table shows the regression results for the original model in Chapter 4, with additional control variables including profitability (PROFIT), capital intensity (CAPINT), intangible intensity (INTANGIBLE), leverage (LEV), growth opportunity (GROWTH), and cash flow constraint (CFC). The measures of these additional control variables follow those employed in Amiram, Bauer and Frank (2013). There are 834 firm-year observations in the sample, after excluding those without prior year data and those with standardised residuals being greater than 3 or smaller than -3.[113] The adjusted R-square is 0.2440, and the F-statistic is 9.67.

Variables	Coef.	Std. Err.	t	P > |t|
FDD	0.1200017	0.0138097	8.69	0.000
FOW	-0.0486036	0.0245976	-1.98	0.049
FOP	0.0000781	0.0147686	0.01	0.996
SIZE	0.0086611	0.002294	3.78	0.000
PROFIT	0.0065472	0.0194345	0.34	0.736
CAPINT	-0.0353253	0.0112825	-3.13	0.002
INTANGIBLE	-0.0192646	0.0117227	-1.64	0.101
LEV	-0.0241281	0.0238802	-1.01	0.313
GROWTH	-0.0066798	0.0025157	-2.66	0.008
CFC	-0.0258821	0.0267368	-0.97	0.333
Industry 1510	0.0067412	0.0180336	0.37	0.709
Industry 2010	0.0030459	0.0183804	0.17	0.868
Industry 2020	0.0314172	0.0202916	1.55	0.122
Industry 2030	0.0250193	0.0252731	0.99	0.322
Industry 2510	0.0056515	0.0413594	0.14	0.891
Industry 2520	0.0534829	0.0236818	2.26	0.024
Industry 2530	0.001387	0.0222229	0.06	0.950
Industry 2540	0.0319215	0.0250653	1.27	0.203
Industry 2550	0.024965	0.0198001	1.26	0.208
Industry 3010	-0.0407378	0.0373224	-1.09	0.275
Industry 3020	-0.0307018	0.0246422	-1.25	0.213
Industry 3030	0.044297	0.0417627	1.06	0.289
Industry 3510	0.0235163	0.0226276	1.04	0.299
Industry 3520	-0.0267779	0.0298967	-0.90	0.371
Industry 4510	-0.0368956	0.0207894	-1.77	0.076
Industry 4520	0.0301159	0.0338394	0.89	0.374

[113] The results before excluding firm-year observations with standardised residuals being greater than 3 or smaller than -3 are similar to those reported in Appendix D.

Industry 4530	0.0277408	0.0610132	0.45	0.649
Industry 5010	0.0281136	0.0251907	1.12	0.265
Year 2010	-0.0292168	0.0097831	-2.99	0.003
Year 2011	-0.0170081	0.0100564	-1.69	0.091
Year 2012	-0.0280744	0.0099908	-2.81	0.005
Constant	0.0820376	0.0561359	1.46	0.144

The regression model is: $\text{CETR} = \alpha + \beta_1\text{FDD} + \beta_2\text{FOW} + \beta_3\text{FOP} + \beta_4\text{SIZE} + \beta_5\text{PROFIT} + \beta_6\text{CAPINT} + \beta_7\text{INTANGIBLE} + \beta_8\text{LEV} + \beta_9\text{GROWTH} + \beta_{10}\text{CFC} + \beta_{11\text{-}28}\text{IND} + \beta_{29\text{-}31}\text{YEAR} + \varepsilon$.

CETR is calculated as (current income tax expense + tax adjustment – royalties and resource rent tax) / pre-tax accounting profit before the share of associates' profit or loss. FDD is calculated as (interim dividend × franking percentage + final dividend × franking percentage + special dividend × franking percentage) / after-tax accounting profit excluding the amount attributable to non-controlling interest. FOW is calculated as the percentage of foreign shareholdings / total percentage of the top 20 shareholdings. FOP is calculated as segment (non-current) assets located in foreign countries / total segment (non-current) assets. SIZE is the natural logarithm of sales revenue. PROFIT is calculated as pre-tax accounting profit before the share of associates' profit or loss / lagged total assets. CAPINT is calculated as property, plant, and equipment / lagged total assets. INTANGIBLE is calculated as intangible assets / lagged total assets. LEV is calculated as long-term debt / lagged total assets. GROWTH is calculated as lagged book equity / lagged market capitalisation. CFC is calculated as 1 – (net operating cash flows / lagged total assets).

Appendix E

The table shows the regression results after incorporating the unfranked dividend distributions measure, UFDD, in the original model in Chapter 4. There are 862 observations, after excluding those with standardised residuals greater than 3 or smaller than -3. The adjusted R-square is 0.2326. The F-statistic is 11.04.

Variables	Coef.	Std. Err.	t	P > |t|
FDD	0.142314	0.013775	10.33	0.000
FOW	-0.04473	0.023562	-1.90	0.058
FOP	-0.00084	0.014539	-0.06	0.954
SIZE	0.007629	0.002194	3.48	0.001
UFDD	0.03909	0.028391	1.38	0.169
Industry 1510	0.007098	0.016924	0.42	0.675
Industry 2010	0.006045	0.016659	0.36	0.717
Industry 2020	0.027772	0.018322	1.52	0.130
Industry 2030	0.012613	0.024218	0.52	0.603
Industry 2510	0.008773	0.040883	0.21	0.830
Industry 2520	0.054373	0.021513	2.53	0.012
Industry 2530	-0.00331	0.020179	-0.16	0.870
Industry 2540	0.028104	0.0232	1.21	0.226
Industry 2550	0.030526	0.018398	1.66	0.097
Industry 3010	-0.04064	0.036662	-1.11	0.268
Industry 3020	-0.04292	0.023278	-1.84	0.066
Industry 3030	0.036533	0.041069	0.89	0.374
Industry 3510	0.025829	0.020778	1.24	0.214
Industry 3520	-0.01541	0.027656	-0.56	0.577
Industry 4510	-0.02873	0.018998	-1.51	0.131
Industry 4520	0.042372	0.030917	1.37	0.171
Industry 4530	0.028041	0.060288	0.47	0.642
Industry 5010	0.027751	0.023927	1.16	0.246
Year 2010	-0.03052	0.009599	-3.18	0.002
Year 2011	-0.02057	0.009886	-2.08	0.038
Year 2012	-0.03062	0.009844	-3.11	0.002
Constant	0.04946	0.043782	1.13	0.259

The regression model is: $\mathrm{CETR} = \alpha + \beta_1 \mathrm{FDD} + \beta_2 \mathrm{FOW} + \beta_3 \mathrm{FOP} + \beta_4 \mathrm{SIZE} + \beta_5 \mathrm{UFDD} + \beta_{6\text{-}23} \mathrm{IND} + \beta_{24\text{-}26} \mathrm{YEAR} + \varepsilon$.

CETR is calculated as (current income tax expense + tax adjustment – royalties and resource rent tax) / pre-tax accounting profit before the share of associates' profit or loss. FDD is calculated as (interim dividend × franking percentage + final dividend × franking percentage + special dividend × franking percentage) / after-tax accounting profit excluding the amount attributable to non-controlling interest. FOW is calculated as the percentage of foreign shareholdings / total percentage of the top 20 shareholdings. FOP is calculated

as segment (non-current) assets located in foreign countries / total segment (non-current) assets. SIZE is the natural logarithm of sales revenue. UFDD is measured by unfranked interim, final and special dividends for the year divided by after-tax profit excluding the amount attributable to non-controlling interest.

Appendix F

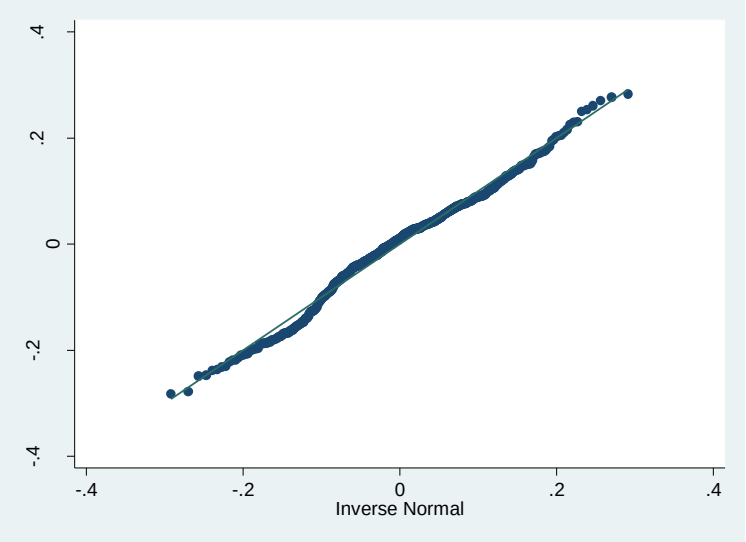
For the main test in Chapter 5, regression diagnostics tests are performed to ensure that the underlying assumptions of the OLS regression are met.

A quantile-quantile (Q-Q) plot is presented to check for normal distribution of residuals. In the Q-Q plot, data points form a relatively straight line matching the line passing through the origin with a unit slope. Some minor deviations from normal at both the upper and lower tails are observed. Generally, it is accepted that the residuals are normally distributed.

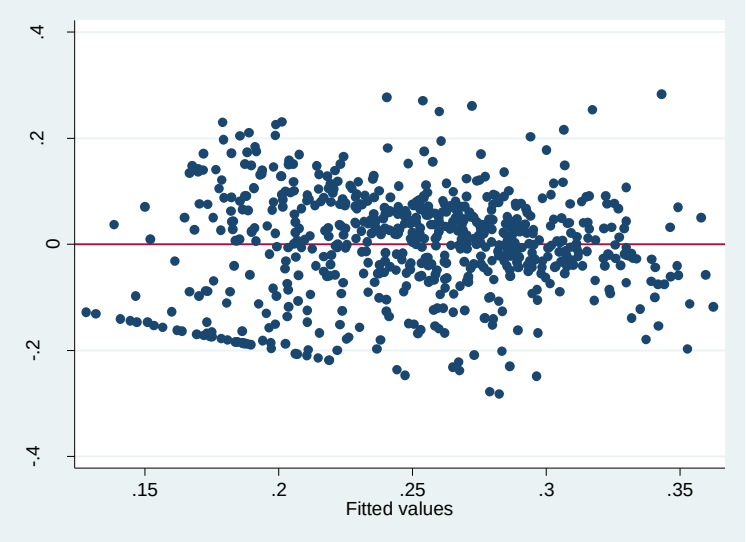
The residual versus the fitted value plot is similar to the one reported in Appendix A for the regression model in Chapter 4: data points are scattered relatively randomly around the horizontal ‘zero’ line and roughly form a horizontal band around the ‘zero’ line. Thus, the linearity and the homoscedasticity assumptions are not violated.

The estimated Durbin-Watson statistic is 2.136613, suggesting that the autocorrelation in the residuals is not a concern for the sample.

Q-Q Plot



Residual versus Fitted Value Plot



The inflation factors of variables (VIFs) in the regression model are calculated to check whether multicollinearity is a concern. The following table shows the results. The highest VIF for variables other than the industry and year dummy variables is 1.50, and the highest VIF for the industry and year dummy variables is 3.66. Therefore, multicollinearity should not be a concern.

Variable	VIF	1/VIF
LOW	1.41	0.70858
HIGH	1.31	0.76438
FDD	1.33	0.75283
SIZE	1.50	0.66721
Industry 1510	2.45	0.40751
Industry 2010	3.66	0.27312
Industry 2020	2.57	0.38883
Industry 2030	1.58	0.63419
Industry 2510	1.19	0.84147
Industry 2520	1.67	0.59967
Industry 2530	1.97	0.50703
Industry 2540	1.62	0.61726
Industry 2550	3.01	0.33269
Industry 3010	1.43	0.69765
Industry 3020	1.62	0.61732
Industry 3030	1.18	0.84853
Industry 3510	1.83	0.54629
Industry 3520	1.25	0.80190
Industry 4510	2.49	0.40118
Industry 4520	1.29	0.77496
Industry 4530	1.10	0.91264
Industry 5010	1.66	0.60402
Year 2010	1.43	0.69830
Year 2011	1.44	0.69670
Year 2012	1.44	0.69638

CETR is calculated as (current income tax expense + tax adjustment – royalties and resource rent tax) / pre-tax accounting profit before the share of associates' profit or loss. LOW is a low-tax country subsidiary indicator which takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in a foreign country with STR not higher than 20% in the particular year, or 0 otherwise. HIGH is a high-tax country subsidiary indicator which takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in a foreign country with STR not lower than 35% in the particular year, or 0 otherwise. FDD is calculated as (interim dividend × franking percentage + final dividend × franking percentage + special dividend × franking percentage) / after-tax accounting profit excluding the amount attributable to non-controlling interest. SIZE is the natural logarithm of sales revenue.

Appendix G

The following table shows the regression results for the original model in Chapter 5 before excluding observations with standardised residuals greater than 3 or smaller than -3. There are 680 firm-year observations. The adjusted R-square is 0.0770. The F-statistic is 3.27.

Variables	Coef.	Std. Err.	t	P > |t|
LOW	0.0160179	0.01122	1.43	0.154
HIGH	0.0090226	0.0115365	0.78	0.434
FDD	0.1007061	0.0172016	5.85	0.000
SIZE	0.0026987	0.0030726	0.88	0.380
Industry 1510	0.0254596	0.0241428	1.05	0.292
Industry 2010	0.0182043	0.0221956	0.82	0.412
Industry 2020	0.0124999	0.0242584	0.52	0.607
Industry 2030	0.0020317	0.0329738	0.06	0.951
Industry 2510	-0.006467	0.0491899	-0.13	0.895
Industry 2520	0.031867	0.0311625	1.02	0.307
Industry 2530	-0.0136413	0.0280561	-0.49	0.627
Industry 2540	0.0190482	0.0319597	0.60	0.551
Industry 2550	0.0290644	0.0242551	1.20	0.231
Industry 3010	-0.0108769	0.0452884	-0.24	0.810
Industry 3020	-0.0410528	0.0319768	-1.28	0.200
Industry 3030	0.0367645	0.0528385	0.70	0.487
Industry 3510	0.0148892	0.0281716	0.53	0.597
Industry 3520	-0.0262383	0.0422124	-0.62	0.534
Industry 4510	-0.0206705	0.0262511	-0.79	0.431
Industry 4520	0.0193463	0.0429353	0.45	0.652
Industry 4530	-0.0003954	0.0719272	-0.01	0.996
Industry 5010	0.0261656	0.0301204	0.87	0.385
Year 2010	-0.0359682	0.0127188	-2.83	0.005
Year 2011	-0.0133284	0.0128765	-1.04	0.301
Year 2012	-0.0266505	0.0128236	-2.08	0.038
Constant	0.1637671	0.0601745	2.72	0.007

The regression model is: $\mathrm{CETR} = \alpha + \beta_1 \mathrm{LOW} + \beta_2 \mathrm{HIGH} + \beta_3 \mathrm{FDD} + \beta_4 \mathrm{SIZE} + \beta_{5\text{-}22} \mathrm{IND} + \beta_{23\text{-}25} \mathrm{YEAR} + \varepsilon$.

CETR is calculated as (current income tax expense + tax adjustment – royalties and resource rent tax) / pre-tax accounting profit before the share of associates' profit or loss. LOW is a low-tax country subsidiary indicator which takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in a foreign country with STR not higher than 20% in the particular year, or 0 otherwise. HIGH is a high-tax country subsidiary indicator which takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in a foreign country with STR not lower than 35% in the particular year, or 0 otherwise. FDD is calculated as (interim dividend × franking percentage + final dividend × franking

percentage + special dividend × franking percentage) / after-tax accounting profit excluding the amount attributable to non-controlling interest. SIZE is the natural logarithm of sales revenue.

Appendix H

The following table shows the regression results for the second additional analysis in Chapter 5 (subsidiaries in foreign zero-tax countries), with the two-way and three-way interactions among ZERO, LOW-R, and HIGH. There are 665 firm-year observations, after excluding those with standardised residuals greater than 3 or smaller than -3. The adjusted R-square is 0.1610. The F-statistic is 5.25.

Variables	Coef.	Std. Err.	t	P > |t|
ZERO	0.0425802	0.0306831	1.39	0.166
LOW-R	0.0046925	0.012021	0.39	0.696
HIGH	-0.0075362	0.0145078	-0.52	0.604
ZERO*LOW-R	-0.0550522	0.0511727	-1.08	0.282
ZERO*HIGH	-0.0274789	0.0518089	-0.53	0.596
LOW-R*HIGH	0.0210352	0.0209312	1.00	0.315
ZERO*LOW-R*HIGH	0.0748266	0.0700183	1.07	0.286
FDD	0.1261388	0.0148121	8.52	0.000
SIZE	0.0023908	0.0027322	0.88	0.382
Industry 1510	0.0100967	0.0211225	0.48	0.633
Industry 2010	0.0112843	0.019466	0.58	0.562
Industry 2020	0.019492	0.0210566	0.93	0.355
Industry 2030	0.0106651	0.0282436	0.38	0.706
Industry 2510	0.0165205	0.0424798	0.39	0.697
Industry 2520	0.0428781	0.0268156	1.60	0.110
Industry 2530	-0.0006836	0.0243377	-0.03	0.978
Industry 2540	0.0255922	0.0273582	0.94	0.350
Industry 2550	0.0385041	0.0209604	1.84	0.067
Industry 3010	-0.0050733	0.0393163	-0.13	0.897
Industry 3020	-0.0275007	0.0274062	-1.00	0.316
Industry 3030	0.0506359	0.0452803	1.12	0.264
Industry 3510	0.0297558	0.024303	1.22	0.221
Industry 3520	-0.0058879	0.0362119	-0.16	0.871
Industry 4510	-0.0103932	0.0226216	-0.46	0.646
Industry 4520	0.0311615	0.0367458	0.85	0.397
Industry 4530	0.0248974	0.0616095	0.40	0.686
Industry 5010	0.0248162	0.0263074	0.94	0.346
Year 2010	-0.0340342	0.010873	-3.13	0.002
Year 2011	-0.0212973	0.0110946	-1.92	0.055
Year 2012	-0.0336245	0.0110708	-3.04	0.002
Constant	0.1515871	0.0535122	2.83	0.005

The regression model is: $\text{CETR} = \alpha + \beta_1\text{ZERO} + \beta_2\text{LOW-R} + \beta_3\text{HIGH} + \beta_4\text{ZERO*LOW-R} + \beta_5\text{ZERO*HIGH} + \beta_6\text{LOW-R*HIGH} + \beta_7\text{ZERO*LOW-R*HIGH} + \beta_8\text{FDD} + \beta_9\text{SIZE} + \beta_{10\text{-}27}\text{IND} + \beta_{28\text{-}30}\text{YEAR} + \varepsilon$.

CETR is calculated as (current income tax expense + tax adjustment – royalties and resource rent tax) / pre-tax accounting profit before the share of associates' profit or loss. ZERO is a zero-tax country subsidiary indicator which takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in a zero-tax (STR) foreign country in the particular year, or 0 otherwise. LOW-R is a low-tax country subsidiary indicator which takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in a foreign country with STR greater than 0 but not higher than 20% in the particular year, or 0 otherwise. HIGH is a high-tax country subsidiary indicator which takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in a foreign country with STR not lower than 35% in the particular year, or 0 otherwise. ZERO*LOW-R is the product of ZERO and LOW-R. ZERO*HIGH is the product of ZERO and HIGH. LOW-R*HIGH is the product of LOW-R and HIGH. ZERO*LOW-R*HIGH is the product of ZERO, LOW-R, and HIGH. FDD is calculated as (interim dividend × franking percentage + final dividend × franking percentage + special dividend × franking percentage) / after-tax accounting profit excluding the amount attributable to non-controlling interest. SIZE is the natural logarithm of sales revenue.

Appendix I

The following table shows the regression results for the original model in Chapter 5, with additional control variables including profitability (PROFIT), capital intensity (CAPINT), intangible intensity (INTANGIBLE), leverage (LEV), growth opportunity (GROWTH), and cash flow constraint (CFC). The measures of these additional control variables follow those employed in Amiram, Bauer and Frank (2013). There are 643 firm-year observations in the sample, after excluding those without prior year data and those with standardised residuals being greater than 3 or smaller than -3.[114] The adjusted R-square is 0.1766, and the F-statistic is 5.44.

Variables	Coef.	Std. Err.	t	P > |t|
LOW	0.0119061	0.0097409	1.22	0.222
HIGH	0.0059587	0.0100025	0.60	0.552
FDD	0.1132912	0.015573	7.27	0.000
SIZE	0.0042524	0.0027283	1.56	0.120
PROFIT	0.0230902	0.0272146	0.85	0.397
CAPINT	-0.0240351	0.0131845	-1.82	0.069
INTANGIBLE	-0.0101955	0.0352023	-0.29	0.772
LEV	-0.0107612	0.0295615	-0.36	0.716
GROWTH	-0.004936	0.0028995	-1.70	0.089
CFC	-0.0568557	0.0338973	-1.68	0.094
Industry 1510	0.0048525	0.0223161	0.22	0.828
Industry 2010	0.003766	0.021321	0.18	0.860
Industry 2020	0.0099789	0.0232058	0.43	0.667
Industry 2030	0.0169392	0.0291616	0.58	0.562
Industry 2510	0.0030483	0.0419601	0.07	0.942
Industry 2520	0.0387745	0.0287172	1.35	0.177
Industry 2530	-0.0000283	0.0265098	-0.00	0.999
Industry 2540	0.0277901	0.0312591	0.89	0.374
Industry 2550	0.0272501	0.0226321	1.20	0.229
Industry 3010	-0.0138418	0.0388008	-0.36	0.721
Industry 3020	-0.0224826	0.0291044	-0.77	0.440
Industry 3030	0.0459595	0.0453614	1.01	0.311
Industry 3510	0.0283723	0.0261992	1.08	0.279
Industry 3520	-0.0270603	0.0380196	-0.71	0.477
Industry 4510	-0.0270104	0.0246666	-1.10	0.274
Industry 4520	0.0243256	0.0377703	0.64	0.520

[114] The results before excluding firm-year observations with standardised residuals being greater than 3 or smaller than -3 are similar to those reported in Appendix I.

Industry 4530	0.0184363	0.0613223	0.30	0.764
Industry 5010	0.0170507	0.0280732	0.61	0.544
Year 2010	-0.0336674	0.0109768	-3.07	0.002
Year 2011	-0.0187561	0.0110284	-1.70	0.090
Year 2012	-0.0366423	0.0109966	-3.33	0.001
Constant	0.1834246	0.0678101	2.70	0.007

The regression model is: $\text{CETR} = \alpha + \beta_1\text{LOW} + \beta_2\text{HIGH} + \beta_3\text{FDD} + \beta_4\text{SIZE} + \beta_5\text{PROFIT} + \beta_6\text{CAPINT} + \beta_7\text{INTANGIBLE} + \beta_8\text{LEV} + \beta_9\text{GROWTH} + \beta_{10}\text{CFC} + \beta_{11\text{-}28}\text{IND} + \beta_{29\text{-}31}\text{YEAR} + \varepsilon$.

CETR is calculated as (current income tax expense + tax adjustment – royalties and resource rent tax) / pre-tax accounting profit before the share of associates' profit or loss. LOW is a low-tax country subsidiary indicator which takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in a foreign country with STR not higher than 20% in the particular year, or 0 otherwise. HIGH is a high-tax country subsidiary indicator which takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in a foreign country with STR not lower than 35% in the particular year, or 0 otherwise. FDD is calculated as (interim dividend × franking percentage + final dividend × franking percentage + special dividend × franking percentage) / after-tax accounting profit excluding the amount attributable to non-controlling interest. SIZE is the natural logarithm of sales revenue. PROFIT is calculated as pre-tax accounting profit before the share of associates' profit or loss / lagged total assets. CAPINT is calculated as property, plant, and equipment / lagged total assets. INTANGIBLE is calculated as intangible assets / lagged total assets. LEV is calculated as long-term debt / lagged total assets. GROWTH is calculated as lagged book equity / lagged market capitalisation. CFC is calculated as 1 – (net operating cash flows / lagged total assets).

Appendix J

The following table shows the regression results for the original model in Chapter 5, with the franked dividend distributions measure (FDD) being replaced by a profitability measure. The profitability measure follows that employed in Amiram, Bauer and Frank (2013). There are 664 firm-year observations, after excluding those without prior year data and those with standardised residuals being greater than 3 or smaller than -3. The adjusted R-square is 0.0560, and the F-statistic is 2.57.

Variables	Coef.	Std. Err.	t	P > |t|
LOW	0.0154766	0.0103121	1.50	0.134
HIGH	-0.0044687	0.0106066	-0.42	0.674
PROFIT	-0.0017218	0.0008815	-1.95	0.051
SIZE	0.0086247	0.0027029	3.19	0.001
Industry 1510	0.0096127	0.0224645	0.43	0.669
Industry 2010	0.0293196	0.0203217	1.44	0.150
Industry 2020	0.0387675	0.0219906	1.76	0.078
Industry 2030	0.0325221	0.0297412	1.09	0.275
Industry 2510	0.0271489	0.0443947	0.61	0.541
Industry 2520	0.0843394	0.0281868	2.99	0.003
Industry 2530	0.0238315	0.0252702	0.94	0.346
Industry 2540	0.0558643	0.0287678	1.94	0.053
Industry 2550	0.0671757	0.0216906	3.10	0.002
Industry 3010	0.0250716	0.0405838	0.62	0.537
Industry 3020	-0.0263389	0.0294218	-0.90	0.371
Industry 3030	0.0795503	0.0474923	1.68	0.094
Industry 3510	0.0437638	0.0255731	1.71	0.088
Industry 3520	-0.025259	0.0382385	-0.66	0.509
Industry 4510	0.0285333	0.0232475	1.23	0.220
Industry 4520	0.0641588	0.0385914	1.66	0.097
Industry 4530	0.0176063	0.0649783	0.27	0.787
Industry 5010	0.0359047	0.0276484	1.30	0.195
Year 2010	-0.0261067	0.0115748	-2.26	0.024
Year 2011	-0.0172149	0.0117595	-1.46	0.144
Year 2012	-0.0268926	0.011686	-2.30	0.022
Constant	0.068432	0.054401	1.26	0.209

The regression model in is: $\text{CETR} = \alpha + \beta_1\text{LOW} + \beta_2\text{HIGH} + \beta_3\text{PROFIT} + \beta_4\text{SIZE} + \beta_{5\text{-}22}\text{IND} + \beta_{23\text{-}25}\text{YEAR} + \varepsilon$.

CETR is calculated as (current income tax expense + tax adjustment – royalties and resource rent tax) / pre-tax accounting profit before the share of associates' profit or loss. LOW is a low-tax country subsidiary indicator which takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in

a foreign country with STR not higher than 20% in the particular year, or 0 otherwise. HIGH is a high-tax country subsidiary indicator which takes the value of 1 if the firm-year observation has at least one subsidiary incorporated in a foreign country with STR not lower than 35% in the particular year, or 0 otherwise. PROFIT is calculated as pre-tax accounting profit before the share of associates' profit or loss / lagged total assets. SIZE is the natural logarithm of sales revenue.

Appendix K

The following tables show the descriptive statistics before and after matching for the main test in Chapter 6.

Panel A Gross Profit Ratio Sub-Sample									
	Full (Unmatched) Sample					Propensity-Score Matched Sample			
Variables	**All Obs.** Mean (Std. Dev.)	**FOACs** Mean (Std. Dev.)	**DOLACs** Mean (Std. Dev.)	**%bias**	***t*-test** t-statistic (P > |t|)	**FOACs** Mean (Std. Dev.)	**DOLACs** Mean (Std. Dev.)	**%bias**	***t*-test** t-statistic (P > |t|)
Gross Profit Ratio	0.333	0.269	0.394	59.5	6.260	0.263	0.374	-60.4	-5.010
	(0.194)	(0.168)	(0.198)		(0.000)	(0.158)	(0.187)		(0.000)
SIZE	12.229	12.699	11.780	-68.3	-7.210	12.490	12.616	-8.1	-0.640
	(1.618)	(1.233)	(1.806)		(0.000)	(1.190)	(1.795)		(0.520)
Industry 1510	0.152	0.114	0.188	-20.6	-2.180	0.180	0.180	0	0.000
	(0.359)	(0.319)	(0.391)		(0.030)	(0.386)	(0.386)		(1.000)
Industry 2010	0.161	0.155	0.166	-2.9	-0.310	0.189	0.189	0	0.000
	(0.368)	(0.363)	(0.373)		(0.759)	(0.393)	(0.393)		(1.000)
Industry 2020	0.040	0.037	0.044	-3.6	-0.380	0.057	0.041	8.3	0.590
	(0.197)	(0.188)	(0.205)		(0.701)	(0.234)	(0.199)		(0.556)
Industry 2030	0.011	0.018	0.004	13.1	1.400	0.008	0.008	0	0.000
	(0.105)	(0.134)	(0.066)		(0.162)	(0.091)	(0.091)		(1.000)
Industry 2510	0.027	0.037	0.017	11.8	1.250	0.025	0.033	-5.0	-0.380
	(0.162)	(0.188)	(0.131)		(0.212)	(0.156)	(0.179)		(0.703)
Industry 2520	0.031	0.014	0.048	-19.9	-2.090	0.025	0.016	4.7	0.450

	(0.174)	(0.117)	(0.214)		(0.037)	(0.156)	(0.128)		(0.653)
Industry 2530	0.018	0.005	0.031	-19.8	-2.080	0.008	0.000	6.2	1.000
	(0.133)	(0.068)	(0.173)		(0.038)	(0.091)	.		(0.318)
Industry 2540	0.018	0.018	0.017	0.6	0.060	0.008	0.025	-12.3	-1.010
	(0.133)	(0.134)	(0.131)		(0.949)	(0.091)	(0.156)		(0.315)
Industry 2550	0.167	0.260	0.079	49.8	5.300	0.139	0.148	-2.2	-0.180
	(0.374)	(0.440)	(0.270)		(0.000)	(0.348)	(0.356)		(0.856)
Industry 3010	0.016	0.023	0.009	11.3	1.200	0.008	0.016	-6.6	-0.580
	(0.124)	(0.150)	(0.093)		(0.230)	(0.091)	(0.128)		(0.563)
Industry 3020	0.063	0.068	0.057	4.8	0.510	0.082	0.098	-6.7	-0.450
	(0.242)	(0.253)	(0.232)		(0.609)	(0.275)	(0.299)		(0.656)
Industry 3030	0.009	0.014	0.004	9.9	1.050	0.016	0.008	8.6	0.580
	(0.094)	(0.117)	(0.066)		(0.295)	(0.128)	(0.091)		(0.563)
Industry 3510	0.076	0.073	0.079	-2.1	-0.220	0.090	0.082	3.1	0.230
	(0.265)	(0.261)	(0.270)		(0.825)	(0.288)	(0.275)		(0.820)
Industry 3520	0.022	0.018	0.026	-5.4	-0.570	0.016	0.016	0	0.000
	(0.148)	(0.134)	(0.160)		(0.571)	(0.128)	(0.128)		(1.000)
Industry 4510	0.042	0.037	0.048	-5.7	-0.600	0.033	0.033	0	0.000
	(0.202)	(0.188)	(0.214)		(0.547)	(0.179)	(0.179)		(1.000)
Industry 4520	0.049	0.064	0.035	13.4	1.420	0.041	0.066	-11.3	-0.850
	(0.216)	(0.245)	(0.184)		(0.156)	(0.199)	(0.249)		(0.395)
Industry 4530	0.002	.	0.004	-9.3	-0.980	0.000	0.000	.	.
	(0.047)	.	(0.066)		(0.329)	.	.		.
Industry 5010	0.013	0.005	0.022	-15.1	-1.590	0.008	0.000	7.1	1.000

	(0.115)	(0.068)	(0.146)		(0.112)	(0.091)	.		(0.318)
Industry 5510	0.009	.	0.017	-18.8	-1.970	0.000	0.000	.	. .
	(0.094)	.	(0.131)		(0.050)				
No. Obs.	*448*	*219*	*229*			*122*	*122*		
Pseudo R-square						*0.1478*			

Gross Profit Ratio is (sales revenue – cost of goods sold) / sales revenue. SIZE is the natural logarithm of sales revenue. There are 448 observations for the full sample, after excluding those with Gross Profit Ratio greater than 1 or smaller than 0. Propensity score matching based on the logit model in Equation (6.7) generates propensity scores with standard deviation of 0.2180 (rounded to four decimal places). Thus, the appropriate caliper is initially determined at 0.05. With the caliper of 0.05, there is no significant difference between the matched FOACs and DOLACs.

Panel B EBIT Ratio Sub-Sample									
	Full (Unmatched) Sample					Propensity-Score Matched Sample			
Variables	**All Obs.** Mean (Std. Dev.)	**FOACs** Mean (Std. Dev.)	**DOLACs** Mean (Std. Dev.)	**%bias**	***t*-test** t-statistic (P > |t|)	**FOACs** Mean (Std. Dev.)	**DOLACs** Mean (Std. Dev.)	**%bias**	***t*-test** t-statistic (P > |t|)
EBIT Ratio	0.125	0.088	0.154	-57	-6.740	0.095	0.142	-39.9	-4.000
	(0.122)	(0.100)	(0.130)		(0.000)	(0.099)	(0.121)		(0.000)
SIZE	12.490	12.705	12.316	25.4	2.980	12.587	12.847	-17	-1.590
	(1.577)	(1.172)	(1.823)		(0.003)	(1.202)	(1.854)		(0.113)
Industry 1510	0.098	0.081	0.112	-10.6	-1.260	0.110	0.110	0	0.000
	(0.298)	(0.273)	(0.316)		(0.207)	(0.314)	(0.314)		(1.000)
Industry 2010	0.169	0.177	0.162	4	0.480	0.203	0.236	-8.8	-0.760
	(0.375)	(0.382)	(0.369)		(0.633)	(0.404)	(0.426)		(0.449)
Industry 2020	0.079	0.046	0.106	-22.7	-2.660	0.066	0.066	0	0.000
	(0.270)	(0.210)	(0.308)		(0.008)	(0.249)	(0.249)		(1.000)
Industry 2030	0.033	0.023	0.041	-9.9	-1.170	0.033	0.038	-3.1	-0.280
	(0.178)	(0.150)	(0.197)		(0.241)	(0.179)	(0.193)		(0.778)
Industry 2510	0.012	0.019	0.006	11.6	1.430	0.016	0.011	4.9	0.450
	(0.109)	(0.138)	(0.079)		(0.154)	(0.128)	(0.105)		(0.654)
Industry 2520	0.022	0.019	0.025	-3.9	-0.460	0.027	0.022	3.7	0.340
	(0.148)	(0.138)	(0.156)		(0.645)	(0.164)	(0.147)		(0.737)
Industry 2530	0.041	0.008	0.069	-32.1	-3.700	0.011	0.011	0	0.000
	(0.199)	(0.088)	(0.253)		(0.000)	(0.105)	(0.105)		(1.000)
Industry 2540	0.031	0.023	0.037	-8.3	-0.990	0.033	0.027	3.2	0.310

	(0.173)	(0.150)	(0.190)		(0.323)	(0.179)	(0.164)		(0.760)
Industry 2550	0.151	0.246	0.075	47.9	5.890	0.137	0.126	3.1	0.310
	(0.359)	(0.432)	(0.263)		(0.000)	(0.345)	(0.333)		(0.757)
Industry 3010	0.014	0.019	0.009	8.3	1.020	0.011	0.016	-4.6	-0.450
	(0.117)	(0.138)	(0.096)		(0.310)	(0.105)	(0.128)		(0.654)
Industry 3020	0.048	0.054	0.044	4.7	0.570	0.060	0.060	0	0.000
	(0.214)	(0.226)	(0.205)		(0.568)	(0.239)	(0.239)		(1.000)
Industry 3030	0.009	0.015	0.003	12.8	1.590	0.000	0.005	-5.7	-1.000
	(0.092)	(0.123)	(0.056)		(0.112)	.	(0.074)		(0.318)
Industry 3510	0.072	0.077	0.069	3.2	0.390	0.082	0.082	0	0.000
	(0.259)	(0.267)	(0.253)		(0.698)	(0.276)	(0.276)		(1.000)
Industry 3520	0.017	0.015	0.019	-2.6	-0.300	0.022	0.022	0	0.000
	(0.130)	(0.123)	(0.136)		(0.761)	(0.147)	(0.147)		(1.000)
Industry 4510	0.057	0.042	0.069	-11.5	-1.360	0.060	0.049	4.8	0.460
	(0.232)	(0.202)	(0.253)		(0.175)	(0.239)	(0.217)		(0.647)
Industry 4520	0.038	0.065	0.016	25.4	3.150	0.027	0.027	0	0.000
	(0.191)	(0.248)	(0.124)		(0.002)	(0.164)	(0.164)		(1.000)
Industry 4530	0.002	0.000	0.003	-7.9	-0.900	0.000	0.000	.	.
	(0.041)	.	(0.056)		(0.369)	.	.		.
Industry 5010	0.024	0.015	0.031	-10.5	-1.230	0.022	0.016	3.6	0.380
	(0.153)	(0.123)	(0.174)		(0.218)	(0.147)	(0.128)		(0.704)
Industry 5510	0.015	0.012	0.019	-5.9	-0.690	0.016	0.033	-13.5	-1.010
	(0.124)	(0.107)	(0.136)		(0.488)	(0.128)	(0.179)		(0.313)
No. Obs.	*581*	*260*	*321*			*182*	*182*		

Pseudo R-square	*0.1120*

EBIT Ratio is (pre-tax accounting profit + interest expense) / sales revenue. SIZE is the natural logarithm of sales revenue. There are 581 observations for the full sample, after excluding those with EBIT Ratio greater than 1 or smaller than 0. Propensity score matching based on the logit model in Equation (6.7) generates propensity scores with standard deviation of 0.1894 (rounded to four decimal places). Thus, the appropriate caliper is initially determined at 0.04. With the caliper of 0.04, there is no significant difference between the matched FOACs and DOLACs.

Panel C Interest Expense Ratio Sub-Sample									
	Full (Unmatched) Sample					Propensity-Score Matched Sample			
	All Obs.	**FOACs**	**DOLACs**		***t*-test**	**FOACs**	**DOLACs**		***t*-test**
Variables	Mean	Mean	Mean	**%bias**	t-statistic	Mean	Mean	**%bias**	t-statistic
	(Std. Dev.)	(Std. Dev.)	(Std. Dev.)		(P > |t|)	(Std. Dev.)	(Std. Dev.)		(P > |t|)
Interest Expense Ratio	0.024	0.020	0.027	-13.9	-1.850	0.029	0.017	22.8	2.560
	(0.052)	(0.045)	(0.056)		(0.065)	(0.055)	(0.034)		(0.011)
SIZE	12.297	12.670	12.016	41.3	5.410	12.561	12.575	-0.9	-0.090
	(1.662)	(1.195)	(1.895)		(0.000)	(1.163)	(1.956)		(0.930)
CAPINT	0.478	0.359	0.568	-83.8	-11.430	0.477	0.474	1	0.100
	(0.267)	(0.268)	(0.229)		(0.000)	(0.257)	(0.235)		(0.917)
Industry 1510	0.131	0.110	0.147	-11.1	-1.490	0.158	0.163	-1.5	-0.140
	(0.338)	(0.313)	(0.354)		(0.137)	(0.366)	(0.371)		(0.893)
Industry 2010	0.165	0.166	0.164	0.7	0.100	0.218	0.198	5.3	0.490
	(0.371)	(0.373)	(0.370)		(0.924)	(0.414)	(0.399)		(0.625)
Industry 2020	0.078	0.053	0.097	-16.7	-2.210	0.079	0.079	0	0.000
	(0.269)	(0.225)	(0.297)		(0.028)	(0.271)	(0.271)		(1.000)
Industry 2030	0.026	0.019	0.031	-7.7	-1.020	0.025	0.010	9.5	1.140
	(0.158)	(0.136)	(0.173)		(0.307)	(0.156)	(0.099)		(0.254)
Industry 2510	0.018	0.025	0.012	9.8	1.360	0.010	0.015	-3.7	-0.450
	(0.131)	(0.157)	(0.108)		(0.175)	(0.099)	(0.121)		(0.654)
Industry 2520	0.024	0.016	0.031	-10	-1.320	0.025	0.035	-6.6	-0.580
	(0.154)	(0.124)	(0.173)		(0.186)	(0.156)	(0.183)		(0.559)

Industry 2530	0.035	0.009	0.055	-25.8	-3.320	0.015	0.010	2.8	0.450
	(0.184)	(0.097)	(0.227)		(0.001)	(0.121)	(0.099)		(0.654)
Industry 2540	0.034	0.031	0.036	-2.3	-0.310	0.030	0.035	-2.7	-0.280
	(0.181)	(0.175)	(0.185)		(0.754)	(0.170)	(0.183)		(0.779)
Industry 2550	0.135	0.223	0.069	44.6	6.220	0.109	0.124	-4.3	-0.460
	(0.342)	(0.417)	(0.253)		(0.000)	(0.312)	(0.330)		(0.643)
Industry 3010	0.013	0.022	0.007	12.4	1.730	0.015	0.015	0	0.000
	(0.115)	(0.147)	(0.084)		(0.083)	(0.121)	(0.121)		(1.000)
Industry 3020	0.051	0.063	0.043	9	1.220	0.059	0.050	4.4	0.440
	(0.221)	(0.243)	(0.202)		(0.221)	(0.237)	(0.217)		(0.662)
Industry 3030	0.008	0.013	0.005	8.4	1.170	0.005	0.010	-5.3	-0.580
	(0.090)	(0.111)	(0.069)		(0.241)	(0.070)	(0.099)		(0.563)
Industry 3510	0.063	0.063	0.064	-0.5	-0.070	0.069	0.054	6.1	0.620
	(0.244)	(0.243)	(0.245)		(0.943)	(0.255)	(0.227)		(0.537)
Industry 3520	0.016	0.016	0.017	-0.7	-0.100	0.020	0.010	7.8	0.820
	(0.126)	(0.124)	(0.128)		(0.922)	(0.140)	(0.099)		(0.412)
Industry 4510	0.057	0.038	0.071	-14.8	-1.950	0.054	0.054	0	0.000
	(0.231)	(0.191)	(0.257)		(0.051)	(0.227)	(0.227)		(1.000)
Industry 4520	0.040	0.066	0.021	21.9	3.060	0.020	0.035	-7.3	-0.920
	(0.197)	(0.248)	(0.145)		(0.002)	(0.140)	(0.183)		(0.360)
Industry 4530	0.001	.	0.002	-6.9	-0.870	.	.	.	.
	(0.037)	.	(0.049)		(0.385)	.	.		.
Industry 5010	0.023	0.013	0.031	-12.6	-1.650	0.020	0.020	0	0.000
	(0.150)	(0.111)	(0.173)		(0.100)	(0.140)	(0.140)		(1.000)

Industry 5510	0.012	0.009	0.014	-4.5	-0.590	0.015	0.025	-9.1	-0.710
	(0.110)	(0.097)	(0.119)		(0.554)	(0.121)	(0.156)		(0.476)
No. Obs.	*741*	*319*	*422*			*202*	*202*		
Pseudo R-square						*0.1997*			

Interest Expense Ratio is interest expense / sales revenue. SIZE is the natural logarithm of sales revenue. CAPINT is non-current assets / total assets. There are 741 observations for the full sample, after excluding those with Interest Expense Ratio greater than 1 or smaller than 0. Propensity score matching based on the logit model in Equation (6.8) generates propensity scores with standard deviation of 0.2471 (rounded to four decimal places). Thus, the appropriate caliper is initially determined at 0.06. With the caliper of 0.06, there is no significant difference between the matched FOACs and DOLACs.

Panel D Leverage Sub-Sample									
	Full (Unmatched) Sample					Propensity-Score Matched Sample			
Variables	**All Obs.** Mean (Std. Dev.)	**FOACs** Mean (Std. Dev.)	**DOLACs** Mean (Std. Dev.)	**%bias**	***t*-test** t-statistic (P > |t|)	**FOACs** Mean (Std. Dev.)	**DOLACs** Mean (Std. Dev.)	**%bias**	***t*-test** t-statistic (P > |t|)
Leverage	0.101	0.080	0.116	-25	-3.380	0.111	0.098	9	0.870
	(0.146)	(0.152)	(0.139)		(0.001)	(0.173)	(0.124)		(0.386)
SIZE	12.301	12.677	12.020	41.4	5.400	12.601	12.493	6.8	0.650
	(1.664)	(1.197)	(1.895)		(0.000)	(1.222)	(1.985)		(0.517)
CAPINT	0.477	0.355	0.569	-86.3	-11.730	0.482	0.466	6.5	0.670
	(0.267)	(0.266)	(0.228)		(0.000)	(0.249)	(0.226)		(0.503)
Industry 1510	0.130	0.108	0.147	-11.9	-1.580	0.152	0.177	-7.6	-0.680
	(0.337)	(0.310)	(0.355)		(0.114)	(0.359)	(0.382)		(0.499)
Industry 2010	0.166	0.168	0.164	1	0.140	0.212	0.187	6.8	0.630
	(0.372)	(0.374)	(0.371)		(0.890)	(0.410)	(0.391)		(0.531)
Industry 2020	0.079	0.054	0.097	-16.5	-2.180	0.081	0.086	-1.9	-0.180
	(0.269)	(0.226)	(0.297)		(0.030)	(0.273)	(0.281)		(0.856)
Industry 2030	0.026	0.019	0.031	-7.6	-1.010	0.025	0.035	-6.5	-0.590
	(0.159)	(0.137)	(0.173)		(0.314)	(0.157)	(0.185)		(0.559)
Industry 2510	0.018	0.025	0.012	9.9	1.370	0.015	0.010	3.7	0.450
	(0.132)	(0.157)	(0.108)		(0.171)	(0.122)	(0.100)		(0.654)
Industry 2520	0.024	0.016	0.031	-10	-1.310	0.025	0.025	0	0.000
	(0.154)	(0.125)	(0.173)		(0.191)	(0.157)	(0.157)		(1.000)
Industry 2530	0.034	0.006	0.055	-28.3	-3.610	0.010	0.005	3	0.580

	(0.181)	(0.079)	(0.228)		(0.000)	(0.100)	(0.071)		(0.563)
Industry 2540	0.034	0.032	0.036	-2.2	-0.300	0.035	0.025	5.6	0.590
	(0.181)	(0.175)	(0.186)		(0.768)	(0.185)	(0.157)		(0.559)
Industry 2550	0.134	0.222	0.069	44.3	6.160	0.091	0.111	-5.9	-0.670
	(0.341)	(0.416)	0.254		(0.000)	(0.288)	(0.315)		(0.506)
Industry 3010	0.014	0.022	0.007	12.5	1.750	0.015	0.015	0	0.000
	(0.116)	(0.147)	(0.084)		(0.081)	(0.122)	(0.122)		(1.000)
Industry 3020	0.052	0.063	0.043	9.2	1.250	0.076	0.056	9	0.810
	(0.221)	(0.244)	(0.203)		(0.213)	(0.265)	(0.230)		(0.418)
Industry 3030	0.008	0.013	0.005	8.5	1.180	0.010	0.010	0	0.000
	(0.090)	(0.112)	(0.069)		(0.238)	(0.100)	(0.100)		(1.000)
Industry 3510	0.064	0.063	0.064	-0.3	-0.050	0.071	0.056	6.2	0.620
	(0.245)	(0.244)	(0.245)		(0.963)	(0.257)	(0.230)		(0.537)
Industry 3520	0.016	0.016	0.017	-0.6	-0.090	0.020	0.030	-8	-0.640
	(0.127)	(0.125)	(0.128)		(0.932)	(0.141)	(0.172)		(0.523)
Industry 4510	0.057	0.038	0.071	-14.7	-1.930	0.056	0.061	-2.2	-0.210
	(0.232)	(0.191)	(0.258)		(0.054)	(0.230)	(0.239)		(0.830)
Industry 4520	0.041	0.066	0.021	22.1	3.080	0.020	0.035	-7.4	-0.920
	(0.198)	(0.249)	(0.145)		(0.002)	(0.141)	(0.185)		(0.360)
Industry 4530	0.001	.	0.002	-6.9	-0.870	.	.	.	.
	(0.037)	.	(0.049)		(0.387)	.	.		.
Industry 5010	0.023	0.013	0.031	-12.5	-1.630	0.015	0.020	-3.5	-0.380
	(0.150)	(0.112)	(0.173)		(0.103)	(0.122)	(0.141)		(0.704)
Industry 5510	0.012	0.009	0.014	-4.4	-0.580	0.015	0.015	0	0.000

	(0.110)	(0.097)	(0.119)	(0.561)	(0.122)	(0.122)	(1.000)
No. Obs.	*737*	*316*	*421*		*198*	*198*	
Pseudo R-square					*0.2087*		

Leverage is long-term borrowings / total assets. SIZE is the natural logarithm of sales revenue. CAPINT is non-current assets / total assets. There are 737 observations for the full sample, after excluding those with Leverage greater than 1 or smaller than 0. Propensity score matching based on the logit model in Equation (6.8) generates propensity scores with standard deviation of 0.2517 (rounded to four decimal places). Thus, the appropriate caliper is initially determined at 0.06. With the caliper of 0.06, there is no significant difference between the matched FOACs and DOLACs.

Panel E Pre-Tax Profit Ratio Sub-Sample									
	Full (Unmatched) Sample					Propensity-Score Matched Sample			
Variables	**All Obs.** Mean (Std. Dev.)	**FOACs** Mean (Std. Dev.)	**DOLACs** Mean (Std. Dev.)	**%bias**	***t*-test** t-statistic (P > |t|)	**FOACs** Mean (Std. Dev.)	**DOLACs** Mean (Std. Dev.)	**%bias**	***t*-test** t-statistic (P > |t|)
Pre-Tax Profit Ratio	0.112	0.079	0.139	-51.8	-6.030	0.086	0.137	-44.1	-4.060
	(0.119)	(0.105)	(0.124)		(0.000)	(0.111)	(0.122)		(0.000)
SIZE	12.511	12.725	12.338	25.3	2.910	12.639	12.853	-13.9	-1.310
	(1.570)	(1.190)	(1.805)		(0.004)	(1.220)	(1.758)		(0.189)
Industry 1510	0.095	0.068	0.117	-16.9	-1.960	0.098	0.109	-4	-0.350
	(0.293)	(0.252)	(0.322)		(0.050)	(0.298)	(0.313)		(0.726)
Industry 2010	0.167	0.176	0.159	4.5	0.530	0.201	0.241	-10.7	-0.900
	(0.373)	(0.382)	(0.366)		(0.595)	(0.402)	(0.429)		(0.367)
Industry 2020	0.079	0.044	0.107	-24	-2.770	0.063	0.034	10.9	1.240
	(0.270)	(0.206)	(0.310)		(0.006)	(0.244)	(0.183)		(0.215)
Industry 2030	0.029	0.020	0.036	-9.5	-1.110	0.029	0.023	3.5	0.340
	(0.167)	(0.140)	(0.186)		(0.269)	(0.168)	(0.150)		(0.736)
Industry 2510	0.013	0.020	0.006	11.8	1.430	0.017	0.011	5	0.450
	(0.111)	(0.140)	(0.080)		(0.155)	(0.131)	(0.107)		(0.653)
Industry 2520	0.023	0.020	0.026	-4	-0.460	0.029	0.029	0	0.000
	(0.151)	(0.140)	(0.159)		(0.642)	(0.168)	(0.168)		(1.000)
Industry 2530	0.043	0.008	0.071	-32.9	-3.710	0.011	0.011	0	0.000
	(0.203)	(0.089)	(0.258)		(0.000)	(0.107)	(0.107)		(1.000)
Industry 2540	0.030	0.024	0.036	-6.9	-0.800	0.034	0.029	3.4	0.310

	(0.172)	(0.153)	(0.186)		(0.424)	(0.183)	(0.168)		(0.760)
Industry 2550	0.156	0.252	0.078	48.2	5.790	0.149	0.132	4.8	0.460
	(0.363)	(0.435)	(0.268)		(0.000)	(0.358)	(0.340)		(0.645)
Industry 3010	0.014	0.020	0.010	8.5	1.010	0.011	0.017	-4.7	-0.450
	(0.119)	(0.140)	(0.098)		(0.312)	(0.107)	(0.131)		(0.653)
Industry 3020	0.045	0.048	0.042	2.8	0.330	0.063	0.057	2.8	0.220
	(0.207)	(0.214)	(0.201)		(0.743)	(0.244)	(0.233)		(0.823)
Industry 3030	0.009	0.016	0.003	13.1	1.590	0.000	0.006	-5.9	-1.000
	(0.094)	(0.126)	(0.057)		(0.112)	.	(0.076)		(0.318)
Industry 3510	0.073	0.080	0.068	4.5	0.530	0.086	0.080	2.2	0.190
	(0.261)	(0.272)	(0.252)		(0.595)	(0.281)	(0.273)		(0.847)
Industry 3520	0.018	0.016	0.019	-2.6	-0.310	0.023	0.023	0	0.000
	(0.133)	(0.126)	(0.138)		(0.758)	(0.150)	(0.150)		(1.000)
Industry 4510	0.057	0.044	0.068	-10.5	-1.220	0.063	0.063	0	0.000
	(0.233)	(0.206)	(0.252)		(0.223)	(0.244)	(0.244)		(1.000)
Industry 4520	0.038	0.068	0.013	28.1	3.430	0.017	0.023	-2.9	-0.380
	(0.190)	(0.252)	(0.113)		(0.001)	(0.131)	(0.150)		(0.704)
Industry 4530	0.002	.	0.003	-8.1	-0.900	0.000	0.000	.	.
	(0.042)	.	(0.057)		(0.368)	.	.		.
Industry 5010	0.025	0.016	0.032	-10.7	-1.240	0.023	0.029	-3.7	-0.340
	(0.157)	(0.126)	(0.178)		(0.217)	(0.150)	(0.168)		(0.736)
Industry 5510	0.014	0.012	0.016	-3.6	-0.420	0.017	0.011	4.9	0.450
	(0.119)	(0.109)	(0.127)		(0.676)	(0.131)	(0.107)		(0.653)
No. Obs.	*558*	*250*	*308*			*174*	*174*		

Pseudo R-square	*0.1180*

Pre-Tax Profit Ratio is pre-tax accounting profit / sales revenue. SIZE is the natural logarithm of sales revenue. There are 558 observations for the full sample, after excluding those with Pre-Tax Profit Ratio greater than 1 or smaller than 0. Propensity score matching based on the logit model in Equation (6.7) generates propensity scores with standard deviation of 0.1942 (rounded to four decimal places). Thus, the appropriate caliper is initially determined at 0.04. With the caliper of 0.04, there is no significant difference between the matched FOACs and DOLACs.

Panel F Income Tax Expense Ratio Sub-Sample									
		Full (Unmatched) Sample				Propensity-Score Matched Sample			
Variables	**All Obs.** Mean (Std. Dev.)	**FOACs** Mean (Std. Dev.)	**DOLACs** Mean (Std. Dev.)	**%bias**	***t*-test** t-statistic (P > |t|)	**FOACs** Mean (Std. Dev.)	**DOLACs** Mean (Std. Dev.)	**%bias**	***t*-test** t-statistic (P > |t|)
Income Tax Expense Ratio	0.031	0.025	0.037	-29.1	-3.570	0.025	0.034	-21.3	-1.870
	(0.042)	(0.041)	(0.042)		(0.000)	(0.039)	(0.043)		(0.063)
SIZE	12.395	12.694	12.157	34.2	4.110	12.620	12.627	-0.5	-0.040
	(1.630)	(1.192)	(1.875)		(0.000)	(1.213)	(1.854)		(0.966)
Industry 1510	0.124	0.100	0.143	-13.4	-1.630	0.117	0.104	4	0.360
	(0.330)	(0.300)	(0.351)		(0.104)	(0.322)	(0.306)		(0.717)
Industry 2010	0.158	0.159	0.158	0.2	0.030	0.208	0.214	-1.8	-0.140
	(0.365)	(0.366)	(0.365)		(0.979)	(0.407)	(0.412)		(0.889)
Industry 2020	0.085	0.052	0.111	-21.8	-2.630	0.078	0.084	-2.4	-0.210
	(0.279)	(0.222)	(0.315)		(0.009)	(0.269)	(0.279)		(0.835)
Industry 2030	0.026	0.022	0.029	-4.5	-0.550	0.026	0.045	-12.3	-0.920
	(0.160)	(0.147)	(0.169)		(0.585)	(0.160)	(0.209)		(0.359)
Industry 2510	0.015	0.018	0.012	5.5	0.690	0.026	0.013	10.6	0.820
	(0.120)	(0.135)	(0.108)		(0.491)	(0.160)	(0.114)		(0.411)
Industry 2520	0.020	0.011	0.026	-11.3	-1.350	0.013	.	9.6	1.420
	(0.139)	(0.105)	(0.160)		(0.177)	(0.114)	.		(0.157)
Industry 2530	0.036	0.007	0.058	-28.9	-3.400	0.013	0.013	0	0.000
	(0.186)	(0.086)	(0.235)		(0.001)	(0.114)	(0.114)		(1.000)

Industry 2540	0.033	0.026	0.038	-6.9	-0.840	0.039	0.045	-3.7	-0.280
	(0.178)	(0.159)	(0.192)		(0.400)	(0.194)	(0.209)		(0.778)
Industry 2550	0.150	0.244	0.076	46.9	5.920	0.104	0.110	-1.8	-0.180
	(0.357)	(0.430)	(0.265)		(0.000)	(0.306)	(0.314)		(0.854)
Industry 3010	0.013	0.018	0.009	8.3	1.050	0.019	0.013	5.6	0.450
	(0.114)	(0.135)	(0.093)		(0.295)	(0.139)	(0.114)		(0.653)
Industry 3020	0.054	0.059	0.050	4.1	0.510	0.071	0.065	2.9	0.822
	(0.226)	(0.236)	(0.218)		(0.612)	(0.258)	(0.247)		(0.230)
Industry 3030	0.008	0.015	0.003	12.6	1.620	.	.	0	.
	(0.090)	(0.121)	(0.054)		(0.106)	.	.		.
Industry 3510	0.065	0.074	0.058	6.2	0.760	0.065	0.084	-7.8	-0.650
	(0.247)	(0.262)	(0.235)		(0.446)	(0.247)	(0.279)		(0.517)
Industry 3520	0.015	0.015	0.015	0.1	0.010	0.013	0.013	0	0.000
	(0.120)	(0.121)	(0.120)		(0.989)	(0.114)	(0.114)		(1.000)
Industry 4510	0.055	0.037	0.070	-14.8	-1.790	0.065	0.052	5.8	0.480
	(0.229)	(0.189)	(0.256)		(0.074)	(0.247)	(0.223)		(0.628)
Industry 4520	0.047	0.077	0.023	24.9	3.150	0.045	0.039	3	0.280
	(0.212)	(0.268)	(0.151)		(0.002)	(0.209)	(0.194)		(0.778)
Industry 4530	0.002	.	0.003	-7.6	-0.890	.	.	.	.
	(0.040)	.	(0.054)		(0.374)	.	.		.
Industry 5010	0.021	0.011	0.029	-12.9	-1.550	0.019	0.013	4.6	0.450
	(0.144)	(0.105)	(0.169)		(0.121)	(0.139)	(0.114)		(0.653)
Industry 5510	0.011	0.007	0.015	-6.9	-0.840	0.013	0.006	6.2	0.580
	(0.106)	(0.086)	(0.120)		(0.403)	(0.114)	(0.081)		(0.563)

No. Obs.	*613*	*271*	*342*		*154*	*154*
Pseudo R-square					*0.1117*	

Income Tax Expense Ratio is income tax expense / sales revenue. SIZE is the natural logarithm of sales revenue. There are 613 observations for the full sample, after excluding those with Income Tax Expense Ratio greater than 1 or smaller than 0. Propensity score matching based on the logit model in Equation (6.7) generates propensity scores with standard deviation of 0.1891 (rounded to four decimal places). Thus, the appropriate caliper is initially determined at 0.04. With the caliper of 0.04, there are significant differences between the matched FOACs and DOLACs. The caliper is further reduced to 0.003 when a matched sample of FOACs and DOLACs is reached for the first time.

Appendix L

The following tables show the OLS regression results in full for the unmatched and matched samples for the main test in Chapter 6.

Panel A Dependent Variable: Gross Profit Ratio								
	Full (Unmatched) Sample (448 Obs.)				Propensity-Score Matched Sample (244 Obs.)			
	Coef.	Std. Err.	t	P > |t|	Coef.	Std. Err.	t	P > |t|
Constant	0.6857	0.0701	9.78	0.000	0.5984	0.1123	5.33	0.000
FOAC	-0.1068	0.0173	-6.16	0.000	-0.1191	0.0201	-5.93	0.000
SIZE	-0.0247	0.0052	-4.73	0.000	-0.0207	0.0073	-2.85	0.005
Industry 1510	-0.0468	0.0349	-1.34	0.181	0.0186	0.0496	0.38	0.708
Industry 2010	-0.0940	0.0348	-2.70	0.007	-0.0389	0.0497	-0.78	0.435
Industry 2020	-0.0347	0.0487	-0.71	0.477	0.0224	0.0639	0.35	0.727
Industry 2030	0.1156	0.0794	1.46	0.146	0.2381	0.1175	2.03	0.044
Industry 2510	-0.0838	0.0559	-1.50	0.134	-0.0349	0.0753	-0.46	0.643
Industry 2520	0.0203	0.0525	0.39	0.699	0.0855	0.0819	1.04	0.298
Industry 2530	0.1951	0.0650	3.00	0.003	0.0612	0.1614	0.38	0.705
Industry 2540	0.1339	0.0651	2.06	0.040	0.2369	0.0902	2.63	0.009
Industry 2550	0.0532	0.0353	1.50	0.133	0.1124	0.0517	2.17	0.031
Industry 3010	-0.0401	0.0690	-0.58	0.561	-0.0585	0.0994	-0.59	0.557
Industry 3020	-0.0501	0.0425	-1.18	0.238	-0.0269	0.0553	-0.49	0.627
Industry 3030	0.1925	0.0875	2.20	0.028	0.2552	0.1000	2.55	0.011
Industry 3510	0.0729	0.0406	1.80	0.073	0.1150	0.0565	2.04	0.043
Industry 3520	0.1702	0.0595	2.86	0.004	0.1774	0.0891	1.99	0.048

Industry 4510	0.1212	0.0476	2.55	0.011	0.1531	0.0705	2.17	0.031
Industry 4520	-0.0346	0.0460	-0.75	0.453	-0.0193	0.0644	-0.30	0.764
Industry 4530	0.0585	0.1669	0.35	0.726	.	.	.	.
Industry 5010	0.0674	0.0732	0.92	0.358	0.4741	0.1612	2.94	0.004
Industry 5510	-0.0271	0.0874	-0.31	0.757	.	.	.	.
Adjusted R-square	*0.2827*				*0.2767*			

Panel B Dependent Variable: EBIT Ratio								
	Full (Unmatched) Sample (581 Obs.)				Propensity-Score Matched Sample (364 Obs.)			
	Coef.	Std. Err.	t	P > |t|	Coef.	Std. Err.	t	P > |t|
Constant	0.2760	0.0413	6.68	0.000	0.2764	0.0604	4.58	0.000
FOAC	-0.0473	0.0100	-4.73	0.000	-0.0488	0.0110	-4.44	0.000
SIZE	-0.0054	0.0030	-1.78	0.075	-0.0056	0.0039	-1.46	0.146
Industry 1510	0.0226	0.0231	0.98	0.327	0.0028	0.0297	0.10	0.924
Industry 2010	-0.0987	0.0211	-4.69	0.000	-0.1047	0.0277	-3.78	0.000
Industry 2020	-0.0635	0.0241	-2.63	0.009	-0.0436	0.0329	-1.33	0.186
Industry 2030	-0.0682	0.0311	-2.19	0.029	-0.0451	0.0378	-1.19	0.234
Industry 2510	-0.0991	0.0457	-2.17	0.030	-0.0795	0.0529	-1.50	0.134
Industry 2520	-0.0964	0.0355	-2.72	0.007	-0.0961	0.0430	-2.23	0.026
Industry 2530	-0.0236	0.0288	-0.82	0.413	-0.0122	0.0575	-0.21	0.831
Industry 2540	-0.0546	0.0316	-1.73	0.085	-0.0517	0.0404	-1.28	0.201
Industry 2550	-0.0793	0.0218	-3.64	0.000	-0.0660	0.0296	-2.23	0.026
Industry 3010	-0.1174	0.0435	-2.70	0.007	-0.1166	0.0529	-2.21	0.028
Industry 3020	-0.1048	0.0275	-3.81	0.000	-0.1091	0.0335	-3.26	0.001
Industry 3030	-0.0578	0.0529	-1.09	0.275	-0.0449	0.1070	-0.42	0.675
Industry 3510	-0.1117	0.0247	-4.52	0.000	-0.0939	0.0315	-2.98	0.003
Industry 3520	0.0271	0.0393	0.69	0.491	0.0489	0.0449	1.09	0.277
Industry 4510	-0.0626	0.0262	-2.39	0.017	-0.0758	0.0342	-2.21	0.027
Industry 4520	-0.1143	0.0300	-3.81	0.000	-0.1078	0.0425	-2.54	0.012
Industry 4530	-0.0685	0.1123	-0.61	0.542	.	.	.	.
Industry 5010	-0.0350	0.0345	-1.01	0.311	-0.0158	0.0462	-0.34	0.732

Industry 5510	0.0468	0.0411	1.14	0.255	0.0495	0.0425	1.16	0.245
Adjusted R-square	*0.1802*				*0.1568*			

Panel C Dependent Variable: Interest Expense Ratio								
	Full (Unmatched) Sample (741 Obs.)				Propensity-Score Matched Sample (404 Obs.)			
	Coef.	Std. Err.	t	P > |t|	Coef.	Std. Err.	t	P > |t|
Constant	0.0498	0.0148	3.37	0.001	0.0381	0.0187	2.04	0.042
FOAC	0.0121	0.0039	3.08	0.002	0.0118	0.0040	2.98	0.003
SIZE	-0.0044	0.0011	-4.09	0.000	-0.0030	0.0014	-2.18	0.030
CAPINT	0.0705	0.0081	8.67	0.000	0.0605	0.0101	5.97	0.000
Industry 1510	-0.0025	0.0079	-0.32	0.750	-0.0153	0.0096	-1.59	0.113
Industry 2010	-0.0143	0.0080	-1.8	0.073	-0.0169	0.0097	-1.74	0.083
Industry 2020	-0.0176	0.0089	-1.99	0.047	-0.0155	0.0109	-1.43	0.155
Industry 2030	0.0038	0.0124	0.31	0.758	0.0024	0.0172	0.14	0.889
Industry 2510	-0.0199	0.0144	-1.38	0.168	-0.0212	0.0197	-1.08	0.282
Industry 2520	-0.0085	0.0126	-0.67	0.503	-0.0032	0.0142	-0.22	0.823
Industry 2530	-0.0063	0.0111	-0.57	0.569	0.0144	0.0196	0.74	0.462
Industry 2540	-0.0167	0.0112	-1.48	0.138	-0.0279	0.0138	-2.02	0.044
Industry 2550	-0.0147	0.0084	-1.76	0.079	-0.0185	0.0102	-1.82	0.069
Industry 3010	-0.0156	0.0162	-0.97	0.333	-0.0271	0.0184	-1.47	0.142
Industry 3020	-0.0097	0.0099	-0.98	0.325	-0.0017	0.0118	-0.15	0.883
Industry 3030	-0.0137	0.0199	-0.69	0.492	-0.0046	0.0243	-0.19	0.850
Industry 3510	-0.0158	0.0095	-1.66	0.098	-0.0161	0.0119	-1.36	0.175
Industry 3520	-0.0130	0.0147	-0.88	0.379	0.0130	0.0182	0.71	0.476
Industry 4510	-0.0206	0.0096	-2.14	0.033	-0.0184	0.0119	-1.55	0.121
Industry 4520	-0.0146	0.0111	-1.32	0.187	-0.0169	0.0148	-1.14	0.256
Industry 4530	-0.0247	0.0463	-0.53	0.594	.	.	.	.

Industry 5010	-0.0364	0.0128	-2.83	0.005	-0.0273	0.0163	-1.68	0.095
Industry 5510	0.1056	0.0167	6.33	0.000	0.0947	0.0164	5.79	0.000
Adjusted R-square	*0.2168*				*0.2571*			

Panel D Dependent Variable: Leverage								
	Full (Unmatched) Sample (737 Obs.)				Propensity-Score Matched Sample (396 Obs.)			
	Coef.	Std. Err.	t	P > |t|	Coef.	Std. Err.	t	P > |t|
Constant	-0.3036	0.0390	-7.78	0.000	-0.2796	0.0608	-4.60	0.000
FOAC	0.0109	0.0103	1.05	0.293	0.0060	0.0127	0.47	0.640
SIZE	0.0165	0.0028	5.81	0.000	0.0166	0.0043	3.84	0.000
CAPINT	0.2687	0.0215	12.47	0.000	0.2925	0.0343	8.53	0.000
Industry 1510	0.0556	0.0210	2.65	0.008	0.0235	0.0329	0.72	0.475
Industry 2010	0.0763	0.0211	3.61	0.000	0.0534	0.0333	1.60	0.110
Industry 2020	0.0678	0.0234	2.91	0.004	0.0237	0.0366	0.65	0.517
Industry 2030	0.1110	0.0325	3.41	0.001	0.0487	0.0466	1.04	0.297
Industry 2510	0.0339	0.0378	0.9	0.370	0.0302	0.0637	0.48	0.635
Industry 2520	0.1075	0.0333	3.23	0.001	0.1084	0.0495	2.19	0.029
Industry 2530	0.1178	0.0295	3.99	0.000	0.0164	0.0785	0.21	0.834
Industry 2540	0.0630	0.0295	2.14	0.033	-0.0335	0.0469	-0.71	0.476
Industry 2550	0.0577	0.0222	2.6	0.009	0.0216	0.0355	0.61	0.543
Industry 3010	0.0352	0.0425	0.83	0.408	-0.0185	0.0595	-0.31	0.756
Industry 3020	0.1098	0.0260	4.23	0.000	0.0688	0.0379	1.81	0.071
Industry 3030	0.1165	0.0523	2.23	0.026	0.1202	0.0694	1.73	0.084
Industry 3510	0.0766	0.0252	3.04	0.002	0.0366	0.0397	0.92	0.357
Industry 3520	0.0831	0.0387	2.15	0.032	0.0623	0.0495	1.26	0.209
Industry 4510	0.0540	0.0254	2.12	0.034	0.0128	0.0394	0.33	0.745
Industry 4520	0.0877	0.0292	3.01	0.003	0.0232	0.0484	0.48	0.633
Industry 4530	0.1199	0.1214	0.99	0.324	.	.	.	.

Industry 5010	0.0280	0.0337	0.83	0.406	-0.0387	0.0557	-0.70	0.487
Industry 5510	0.2389	0.0437	5.47	0.000	0.1485	0.0591	2.51	0.012
Adjusted R-square	*0.3217*				*0.3025*			

Panel E Dependent Variable: Pre-Tax Profit Ratio								
	Full (Unmatched) Sample (558 Obs.)				Propensity-Score Matched Sample (348 Obs.)			
	Coef.	Std. Err.	t	P > |t|	Coef.	Std. Err.	t	P > |t|
Constant	0.2776	0.0418	6.64	0.000	0.3737	0.0613	6.10	0.000
FOAC	-0.0422	0.0101	-4.18	0.000	-0.0525	0.0115	-4.57	0.000
SIZE	-0.0061	0.0031	-2.00	0.046	-0.0099	0.0041	-2.39	0.017
Industry 1510	0.0206	0.0231	0.89	0.373	-0.0088	0.0284	-0.31	0.758
Industry 2010	-0.1007	0.0209	-4.82	0.000	-0.1550	0.0256	-6.05	0.000
Industry 2020	-0.0725	0.0240	-3.02	0.003	-0.1036	0.0344	-3.01	0.003
Industry 2030	-0.0958	0.0325	-2.95	0.003	-0.1239	0.0419	-2.96	0.003
Industry 2510	-0.1048	0.0450	-2.33	0.020	-0.1416	0.0528	-2.68	0.008
Industry 2520	-0.1160	0.0350	-3.32	0.001	-0.1703	0.0408	-4.18	0.000
Industry 2530	-0.0580	0.0284	-2.04	0.042	-0.1190	0.0576	-2.06	0.040
Industry 2540	-0.0682	0.0318	-2.14	0.032	-0.1142	0.0393	-2.90	0.004
Industry 2550	-0.0833	0.0215	-3.88	0.000	-0.1167	0.0274	-4.26	0.000
Industry 3010	-0.1178	0.0428	-2.75	0.006	-0.1513	0.0532	-2.85	0.005
Industry 3020	-0.1144	0.0280	-4.08	0.000	-0.1588	0.0323	-4.92	0.000
Industry 3030	-0.0618	0.0521	-1.19	0.237	-0.0997	0.1089	-0.92	0.360
Industry 3510	-0.1155	0.0245	-4.71	0.000	-0.1538	0.0300	-5.12	0.000
Industry 3520	0.0215	0.0388	0.55	0.580	-0.0378	0.0440	-0.86	0.391
Industry 4510	-0.0621	0.0261	-2.38	0.017	-0.0938	0.0320	-2.93	0.004
Industry 4520	-0.1107	0.0300	-3.69	0.000	-0.1548	0.0472	-3.28	0.001
Industry 4530	-0.0749	0.1106	-0.68	0.499	.	.	.	.
Industry 5010	-0.0405	0.0340	-1.19	0.234	-0.0802	0.0418	-1.92	0.056

Industry 5510	-0.0656	0.0425	-1.54	0.123	-0.0755	0.0525	-1.44	0.151
Adjusted R-square	*0.1642*				*0.2031*			

Panel F Dependent Variable: Income Tax Expense Ratio								
	Full (Unmatched) Sample (613 Obs.)				Propensity-Score Matched Sample (308 Obs.)			
	Coef.	Std. Err.	t	P > |t|	Coef.	Std. Err.	t	P > |t|
Constant	0.0850	0.0139	6.13	0.000	0.0815	0.0211	3.86	0.000
FOAC	-0.0079	0.0034	-2.33	0.020	-0.0079	0.0045	-1.76	0.079
SIZE	0.0001	0.0010	0.05	0.958	-0.0003	0.0015	-0.17	0.869
Industry 1510	-0.0358	0.0077	-4.68	0.000	-0.0294	0.0105	-2.79	0.006
Industry 2010	-0.0613	0.0074	-8.30	0.000	-0.0552	0.0095	-5.84	0.000
Industry 2020	-0.0536	0.0082	-6.50	0.000	-0.0491	0.0113	-4.36	0.000
Industry 2030	-0.0607	0.0115	-5.27	0.000	-0.0507	0.0143	-3.53	0.000
Industry 2510	-0.0670	0.0144	-4.67	0.000	-0.0555	0.0180	-3.09	0.002
Industry 2520	-0.0625	0.0128	-4.88	0.000	-0.0628	0.0289	-2.18	0.030
Industry 2530	-0.0479	0.0104	-4.62	0.000	-0.0489	0.0211	-2.31	0.021
Industry 2540	-0.0426	0.0107	-3.98	0.000	-0.0263	0.0136	-1.94	0.053
Industry 2550	-0.0558	0.0075	-7.40	0.000	-0.0458	0.0106	-4.31	0.000
Industry 3010	-0.0673	0.0151	-4.45	0.000	-0.0576	0.0194	-2.96	0.003
Industry 3020	-0.0649	0.0092	-7.06	0.000	-0.0599	0.0118	-5.07	0.000
Industry 3030	-0.0476	0.0184	-2.58	0.010	.	.	.	.
Industry 3510	-0.0630	0.0088	-7.19	0.000	-0.0541	0.0115	-4.69	0.000
Industry 3520	-0.0360	0.0143	-2.51	0.012	-0.0389	0.0212	-1.84	0.067
Industry 4510	-0.0519	0.0091	-5.68	0.000	-0.0520	0.0123	-4.23	0.000
Industry 4520	-0.0651	0.0096	-6.76	0.000	-0.0595	0.0136	-4.37	0.000
Industry 4530	-0.0450	0.0391	-1.15	0.250	.	.	.	.
Industry 5010	-0.0397	0.0124	-3.20	0.001	-0.0158	0.0194	-0.82	0.414

Industry 5510	-0.0559	0.0159	-3.52	0.000	-0.0340	0.0240	-1.41	0.159
Adjusted R-square	*0.1399*				*0.1152*			

Gross Profit Ratio is (sales revenue – cost of goods sold) / sales revenue. EBIT Ratio is (pre-tax accounting profit + interest expense) / sales revenue. Interest Expense Ratio is interest expense / sales revenue. Leverage is long-term borrowings / total assets. Pre-Tax Profit Ratio is pre-tax accounting profit / sales revenue. Income Tax Expense Ratio is income tax expense / sales revenue. SIZE is the natural logarithm of sales revenue. CAPINT is non-current assets / total assets. FOAC is an indicator which takes the value of 1 if the company is a FOAC, and 0 otherwise.

Appendix M

The following tables show descriptive statistics before and after matching for the robustness check in Chapter 6.

Panel A Gross Profit Ratio Sub-Sample									
	Full (Unmatched) Sample					**Propensity-Score Matched Sample**			
Variables	**All Obs.** Mean (Std. Dev.)	**FOACs** Mean (Std. Dev.)	**DOLACs** Mean (Std. Dev.)	**%bias**	***t*-test** t-statistic (P > |t|)	**FOACs** Mean (Std. Dev.)	**DOLACs** Mean (Std. Dev.)	**%bias**	***t*-test** t-statistic (P > |t|)
Gross Profit Ratio	0.327	0.265	0.388	-68	-6.950	0.270	0.370	-55.1	-4.430
	(0.191)	(0.165)	(0.195)		(0.000)	(0.151)	(0.191)		(0.000)
SIZE	12.222	12.718	11.725	65.2	6.670	12.449	12.622	-11.4	-0.920
	(1.600)	(1.238)	(1.763)		(0.000)	(1.132)	(1.679)		(0.356)
Industry 1510	0.163	0.120	0.206	-23.4	-2.400	0.197	0.179	4.7	0.330
	(0.370)	(0.325)	(0.405)		(0.017)	(0.399)	(0.385)		(0.739)
Industry 2010	0.172	0.163	0.182	-5.1	-0.520	0.188	0.214	-6.8	-0.490
	(0.378)	(0.370)	(0.387)		(0.605)	(0.392)	(0.412)		(0.626)
Industry 2020	0.043	0.038	0.048	-4.7	-0.480	0.051	0.051	0	0.000
	(0.203)	(0.192)	(0.214)		(0.631)	(0.222)	(0.222)		(1.000)
Industry 2030	0.012	0.019	0.005	13.2	1.350	0.017	0.009	7.9	0.580
	(0.109)	(0.137)	(0.069)		(0.178)	(0.130)	(0.092)		(0.563)
Industry 2510	0.029	0.038	0.019	11.5	1.170	0.026	0.034	-5.1	-0.380
	(0.167)	(0.192)	(0.137)		(0.242)	(0.159)	(0.182)		(0.703)
Industry 2520	0.033	0.014	0.053	-21.3	-2.180	0.026	0.017	4.8	0.450

	(0.180)	(0.119)	(0.224)		(0.030)	(0.159)	(0.130)		(0.653)
Industry 2540	0.019	0.019	0.019	0	0.000	0.026	0.026	0	0.000
	(0.137)	(0.137)	(0.137)		(1.000)	(0.159)	(0.159)		(1.000)
Industry 2550	0.179	0.273	0.086	50	5.110	0.154	0.154	0	0.000
	(0.384)	(0.446)	(0.281)		(0.000)	(0.362)	(0.362)		(1.000)
Industry 3020	0.067	0.072	0.062	3.8	0.390	0.077	0.077	0	0.000
	(0.250)	(0.259)	(0.242)		(0.696)	(0.268)	(0.268)		(1.000)
Industry 3510	0.081	0.077	0.086	-3.5	-0.360	0.094	0.068	9.4	0.720
	(0.274)	(0.267)	(0.281)		(0.721)	(0.293)	(0.253)		(0.475)
Industry 3520	0.024	0.019	0.029	-6.3	-0.640	0.026	0.017	5.6	0.450
	(0.153)	(0.137)	(0.167)		(0.523)	(0.159)	(0.130)		(0.653)
Industry 4510	0.045	0.038	0.053	-6.9	-0.700	0.026	0.043	-8.2	-0.720
	(0.209)	(0.192)	(0.224)		(0.482)	(0.159)	(0.203)		(0.474)
Industry 4520	0.053	0.067	0.038	12.9	1.310	0.034	0.068	-15.3	-1.180
	(0.224)	(0.251)	(0.192)		(0.190)	(0.182)	(0.253)		(0.238)
No. Obs.	*418*	*209*	*209*			*117*	*117*		
Pseudo R-square						*0.1500*			

Gross Profit Ratio is (sales revenue – cost of goods sold) / sales revenue. SIZE is the natural logarithm of sales revenue. There are 418 observations for the full sample, after excluding those with Gross Profit Ratio greater than 1 or smaller than 0. Propensity score matching based on the logit model in Equation (6.7) generates propensity scores with standard deviation of 0.2196 (rounded to four decimal places). Thus, the appropriate caliper is initially determined at 0.05. With the caliper of 0.05, there is no significant difference between the matched FOACs and DOLACs.

Panel B EBIT Ratio Sub-Sample									
	Full (Unmatched) Sample					Propensity-Score Matched Sample			
Variables	**All Obs.** Mean (Std. Dev.)	**FOACs** Mean (Std. Dev.)	**DOLACs** Mean (Std. Dev.)	**%bias**	***t*-test** t-statistic (P > |t|)	**FOACs** Mean (Std. Dev.)	**DOLACs** Mean (Std. Dev.)	**%bias**	***t*-test** t-statistic (P > |t|)
EBIT Ratio	0.120	0.084	0.152	-58.6	-6.580	0.086	0.145	-50.0	-5.040
	(0.123)	(0.096)	(0.135)		(0.000)	(0.086)	(0.126)		(0.000)
SIZE	12.455	12.700	12.243	30.6	3.430	12.570	12.798	-15.2	-1.480
	(1.530)	(1.162)	(1.764)		(0.001)	(1.144)	(1.677)		(0.140)
Industry 1510	0.110	0.087	0.129	-13.8	-1.560	0.115	0.103	3.7	0.340
	(0.313)	(0.282)	(0.336)		(0.120)	(0.320)	(0.305)		(0.732)
Industry 2010	0.188	0.190	0.187	0.8	0.090	0.241	0.247	-1.5	-0.120
	(0.391)	(0.393)	(0.391)		(0.930)	(0.429)	(0.433)		(0.901)
Industry 2020	0.088	0.050	0.122	-26.1	-2.930	0.069	0.103	-12.4	-1.140
	(0.284)	(0.218)	(0.328)		(0.004)	(0.254)	(0.305)		(0.253)
Industry 2030	0.037	0.025	0.047	-11.8	-1.330	0.034	0.029	3.1	0.310
	(0.188)	(0.156)	(0.212)		(0.184)	(0.183)	(0.168)		(0.760)
Industry 2510	0.013	0.021	0.007	11.5	1.330	0.017	0.011	4.9	0.450
	(0.115)	(0.143)	(0.085)		(0.184)	(0.131)	(0.107)		(0.653)
Industry 2520	0.025	0.021	0.029	-5.2	-0.590	0.029	0.017	7.4	0.710
	(0.156)	(0.143)	(0.167)		(0.555)	(0.168)	(0.131)		(0.476)
Industry 2540	0.035	0.025	0.043	-10.1	-1.140	0.034	0.029	3.2	0.310
	(0.183)	(0.156)	(0.204)		(0.254)	(0.183)	(0.168)		(0.760)
Industry 2550	0.169	0.264	0.086	48.1	5.550	0.132	0.138	-1.6	-0.160

	(0.375)	(0.442)	(0.281)		(0.000)	(0.340)	(0.346)		(0.876)
Industry 3020	0.054	0.058	0.050	3.3	0.380	0.063	0.069	-2.5	-0.220
	(0.226)	(0.234)	(0.219)		(0.706)	(0.244)	(0.254)		(0.830)
Industry 3510	0.081	0.083	0.079	1.3	0.150	0.103	0.103	0	0.000
	(0.273)	(0.276)	(0.270)		(0.884)	(0.305)	(0.305)		(1.000)
Industry 3520	0.019	0.017	0.022	-3.7	-0.420	0.023	0.017	4.2	0.380
	(0.137)	(0.128)	(0.146)		(0.676)	(0.150)	(0.131)		(0.704)
Industry 4510	0.063	0.045	0.079	-13.9	-1.570	0.057	0.069	-4.8	-0.440
	(0.244)	(0.209)	(0.270)		(0.117)	(0.233)	(0.254)		(0.661)
Industry 4520	0.042	0.070	0.018	25.6	2.970	0.023	0.029	-2.8	-0.340
	(0.201)	(0.256)	(0.133)		(0.003)	(0.150)	(0.168)		(0.736)
No. Obs.	*520*	*242*	*278*			*174*	*174*		
Pseudo R-square						*0.0989*			

EBIT Ratio is (pre-tax accounting profit + interest expense) / sales revenue. SIZE is the natural logarithm of sales revenue. There are 520 observations for the full sample, after excluding those with EBIT Ratio greater than 1 or smaller than 0. Propensity score matching based on the logit model in Equation (6.7) generates propensity scores with standard deviation of 0.1804 (rounded to four decimal places). Thus, the appropriate caliper is initially determined at 0.04. With the caliper of 0.04, there is no significant difference between the matched FOACs and DOLACs.

Panel C Interest Expense Ratio Sub-Sample									
	Full (Unmatched) Sample					Propensity-Score Matched Sample			
Variables	**All Obs.** Mean (Std. Dev.)	**FOACs** Mean (Std. Dev.)	**DOLACs** Mean (Std. Dev.)	**%bias**	***t*-test** t-statistic (P > |t|)	**FOACs** Mean (Std. Dev.)	**DOLACs** Mean (Std. Dev.)	**%bias**	***t*-test** t-statistic (P > |t|)
Interest Expense Ratio	0.022	0.018	0.025	-13.6	-1.740	0.027	0.017	21.1	2.310
	(0.049)	(0.043)	(0.054)		(0.083)	(0.053)	(0.029)		(0.022)
SIZE	12.266	12.665	11.948	46.1	5.800	12.501	12.528	-1.7	-0.170
	(1.630)	(1.192)	(1.848)		(0.000)	(1.163)	(1.866)		(0.868)
CAPINT	0.463	0.353	0.552	-80.8	-10.500	0.471	0.474	-1.3	-0.120
	(0.263)	(0.264)	(0.227)		(0.000)	(0.256)	(0.233)		(0.902)
Industry 1510	0.144	0.117	0.166	-13.9	-1.770	0.168	0.174	-1.6	-0.140
	(0.352)	(0.322)	(0.372)		(0.077)	(0.375)	(0.380)		(0.890)
Industry 2010	0.182	0.178	0.184	-1.7	-0.220	0.234	0.196	9.9	0.890
	(0.386)	(0.383)	(0.388)		(0.825)	(0.424)	(0.398)		(0.376)
Industry 2020	0.086	0.057	0.110	-19.1	-2.420	0.092	0.082	3.9	0.370
	(0.281)	(0.232)	(0.313)		(0.016)	(0.290)	(0.274)		(0.712)
Industry 2030	0.028	0.020	0.035	-8.9	-1.140	0.027	0.049	-13.3	-1.090
	(0.166)	(0.141)	(0.183)		(0.256)	(0.163)	(0.216)		(0.277)
Industry 2510	0.019	0.027	0.013	9.6	1.260	0.011	0.016	-3.9	-0.450
	(0.138)	(0.162)	(0.115)		(0.208)	(0.104)	(0.127)		(0.654)
Industry 2520	0.027	0.017	0.035	-11.4	-1.430	0.027	0.022	3.4	0.340
	(0.162)	(0.129)	(0.183)		(0.152)	(0.163)	(0.146)		(0.737)

Industry 2540	0.037	0.034	0.040	-3.5	-0.450	0.038	0.033	2.9	0.280
	(0.189)	(0.180)	(0.196)		(0.656)	(0.192)	(0.178)		(0.778)
Industry 2550	0.149	0.238	0.078	45.1	5.960	0.109	0.152	-12.2	-1.240
	(0.356)	(0.427)	(0.268)		(0.000)	(0.312)	(0.360)		(0.217)
Industry 3020	0.057	0.067	0.048	8.1	1.060	0.071	0.060	4.7	0.420
	(0.231)	(0.251)	(0.214)		(0.290)	(0.257)	(0.238)		(0.674)
Industry 3510	0.070	0.067	0.072	-2	-0.260	0.060	0.038	8.5	0.970
	(0.255)	(0.251)	(0.259)		(0.798)	(0.238)	(0.192)		(0.335)
Industry 3520	0.018	0.017	0.019	-1.5	-0.190	0.022	0.016	4.1	0.380
	(0.133)	(0.129)	(0.136)		(0.851)	(0.146)	(0.127)		(0.704)
Industry 4510	0.063	0.040	0.080	-16.8	-2.130	0.060	0.060	0	0.000
	(0.242)	(0.197)	(0.272)		(0.034)	(0.238)	(0.238)		(1.000)
Industry 4520	0.045	0.070	0.024	22	2.910	0.027	0.038	-5.1	-0.590
	(0.207)	(0.256)	(0.153)		(0.004)	(0.163)	(0.192)		(0.558)
No. Obs.	*672*	*298*	*374*			*184*	*184*		
Pseudo R-square						*0.1953*			

Interest Expense Ratio is interest expense / sales revenue. SIZE is the natural logarithm of sales revenue. CAPINT is non-current assets / total assets. There are 672 observations for the full sample, after excluding those with Interest Expense Ratio greater than 1 or smaller than 0. Propensity score matching based on the logit model in Equation (6.8) generates propensity scores with standard deviation of 0.2457 (rounded to four decimal places). Thus, the appropriate caliper is initially determined at 0.06. With the caliper of 0.06, there is no significant difference between the matched FOACs and DOLACs.

Panel D Leverage Sub-Sample									
	Full (Unmatched) Sample					Propensity-Score Matched Sample			
Variables	**All Obs.** Mean (Std. Dev.)	**FOACs** Mean (Std. Dev).	**DOLACs** Mean (Std. Dev.)	**%bias**	***t*-test** t-statistic (P > |t|)	**FOACs** Mean (Std. Dev.)	**DOLACs** Mean (Std. Dev.)	**%bias**	***t*-test** t-statistic (P > |t|)
Leverage	0.094	0.079	0.105	-18	-2.330	0.108	0.107	0.5	0.040
	(0.141)	(0.152)	(0.131)		(0.020)	(0.171)	(0.123)		(0.967)
SIZE	12.270	12.670	11.953	46.1	5.780	12.519	12.442	5	0.470
	(1.631)	(1.193)	(1.849)		(0.000)	(1.140)	(1.872)		(0.637)
CAPINT	0.464	0.351	0.553	-82.3	-10.670	0.477	0.466	4.7	0.460
	(0.263)	(0.264)	(0.226)		(0.000)	(0.249)	(0.232)		(0.646)
Industry 1510	0.143	0.115	0.166	-14.8	-1.880	0.166	0.160	1.6	0.140
	(0.351)	(0.319)	(0.373)		(0.060)	(0.373)	(0.368)		(0.887)
Industry 2010	0.182	0.179	0.185	-1.5	-0.200	0.210	0.227	-4.3	-0.380
	(0.386)	(0.384)	(0.389)		(0.844)	(0.408)	(0.420)		(0.704)
Industry 2020	0.087	0.057	0.110	-19	-2.400	0.083	0.044	14.0	1.510
	(0.282)	(0.233)	(0.313)		(0.017)	(0.276)	(0.206)		(0.132)
Industry 2030	0.028	0.020	0.035	-8.9	-1.130	0.028	0.039	-6.7	-0.590
	(0.166)	(0.141)	(0.184)		(0.260)	(0.164)	(0.193)		(0.558)
Industry 2510	0.019	0.027	0.013	9.7	1.270	0.022	0.011	7.8	0.820
	(0.138)	(0.162)	(0.115)		(0.205)	(0.147)	(0.105)		(0.412)
Industry 2520	0.027	0.017	0.035	-11.3	-1.430	0.028	0.028	0	0.000
	(0.162)	(0.129)	(0.184)		(0.154)	(0.164)	(0.164)		(1.000)
Industry 2540	0.037	0.034	0.040	-3.4	-0.430	0.044	0.039	2.9	0.260

	(0.190)	(0.181)	(0.197)		(0.664)	(0.206)	(0.193)		(0.793)
Industry 2550	0.148	0.236	0.078	44.6	5.880	0.110	0.138	-7.8	-0.790
	(0.355)	(0.426)	(0.268)		(0.000)	(0.314)	(0.346)		(0.427)
Industry 3020	0.057	0.068	0.048	8.3	1.070	0.083	0.066	7.1	0.600
	(0.232)	(0.251)	(0.215)		(0.285)	(0.276)	(0.249)		(0.550)
Industry 3510	0.070	0.068	0.072	-1.9	-0.240	0.077	0.050	10.8	1.080
	(0.256)	(0.251)	(0.259)		(0.809)	(0.268)	(0.218)		(0.283)
Industry 3520	0.018	0.017	0.019	-1.4	-0.180	0.022	0.022	0	0.000
	(0.133)	(0.129)	(0.136)		(0.856)	(0.147)	(0.147)		(1.000)
Industry 4510	0.063	0.041	0.080	-16.8	-2.120	0.055	0.055	0	0.000
	(0.243)	(0.198)	(0.272)		(0.035)	(0.229)	(0.229)		(1.000)
Industry 4520	0.045	0.071	0.024	22.1	2.920	0.017	0.044	-13.0	-1.530
	(0.207)	(0.257)	(0.154)		(0.004)	(0.128)	(0.206)		(0.126)
No. Obs.	*669*	*296*	*373*			*181*	*181*		
Pseudo R-square						*0.198*			

Leverage is long-term borrowings / total assets. SIZE is the natural logarithm of sales revenue. CAPINT is non-current assets / total assets. There are 669 observations for the full sample, after excluding those with Leverage greater than 1 or smaller than 0. Propensity score matching based on the logit model in Equation (6.8) generates propensity scores with standard deviation of 0.2472 (rounded to four decimal places). Thus, the appropriate caliper is initially determined at 0.06. With the caliper of 0.06, there are still significant differences between the matched FOACs and DOLACs. The caliper is reduced to 0.04 when a balanced sample of FOACs and DOLACs is reached for the first time.

Panel E Pre-Tax Profit Ratio Sub-Sample									
	Full (Unmatched) Sample					Propensity-Score Matched Sample			
Variables	**All Obs.** Mean (Std. Dev.)	**FOACs** Mean (Std. Dev.)	**DOLACs** Mean (Std. Dev.)	**%bias**	***t*-test** t-statistic (P > |t|)	**FOACs** Mean (Std. Dev.)	**DOLACs** Mean (Std. Dev.)	**%bias**	***t*-test** t-statistic (P > |t|)
Pre-Tax Profit Ratio	0.111	0.078	0.139	-52.7	-5.830	0.086	0.120	-28.9	-2.780
	(0.122)	(0.105)	(0.129)		(0.000)	(0.118)	(0.101)		(0.006)
SIZE	12.478	12.721	12.266	30.6	3.360	12.615	12.855	-16.2	-1.470
	(1.520)	(1.181)	(1.737)		(0.001)	(1.224)	(1.670)		(0.141)
Industry 1510	0.106	0.073	0.135	-20.4	-2.250	0.105	0.080	8.1	0.760
	(0.309)	(0.261)	(0.343)		(0.025)	(0.307)	(0.273)		(0.445)
Industry 2010	0.187	0.190	0.184	1.4	0.160	0.247	0.253	-1.6	-0.130
	(0.390)	(0.393)	(0.388)		(0.877)	(0.433)	(0.436)		(0.898)
Industry 2020	0.088	0.047	0.124	-27.6	-3.030	0.068	0.068	0	0.000
	(0.284)	(0.213)	(0.330)		(0.003)	(0.252)	(0.252)		(1.000)
Industry 2030	0.032	0.022	0.041	-11.3	-1.250	0.031	0.049	-10.6	-0.850
	(0.177)	(0.146)	(0.199)		(0.212)	(0.173)	(0.217)		(0.397)
Industry 2510	0.014	0.022	0.008	11.7	1.330	0.012	0.012	0	0.000
	(0.118)	(0.146)	(0.087)		(0.185)	(0.111)	(0.111)		(1.000)
Industry 2520	0.026	0.022	0.030	-5.4	-0.590	0.031	0.025	3.9	0.340
	(0.160)	(0.146)	(0.171)		(0.553)	(0.173)	(0.156)		(0.736)
Industry 2540	0.034	0.026	0.041	-8.6	-0.950	0.037	0.043	-3.4	-0.280
	(0.182)	(0.159)	(0.199)		(0.343)	(0.189)	(0.204)		(0.778)
Industry 2550	0.175	0.272	0.090	48.4	5.460	0.148	0.148	0	0.000

	(0.380)	(0.446)	(0.287)		(0.000)	(0.356)	(0.356)		(1.000)
Industry 3020	0.050	0.052	0.049	1.3	0.150	0.049	0.068	-8.5	-0.710
	(0.219)	(0.222)	(0.216)		(0.885)	(0.217)	(0.252)		(0.480)
Industry 3510	0.082	0.086	0.079	2.6	0.290	0.093	0.074	6.7	0.600
	(0.275)	(0.281)	(0.270)		(0.769)	(0.291)	(0.263)		(0.548)
Industry 3520	0.020	0.017	0.023	-3.8	-0.420	0.025	0.012	8.8	0.820
	(0.140)	(0.130)	(0.149)		(0.674)	(0.156)	(0.111)		(0.411)
Industry 4510	0.064	0.047	0.079	-13	-1.430	0.062	0.068	-2.5	-0.220
	(0.245)	(0.213)	(0.270)		(0.153)	(0.241)	(0.252)		(0.822)
Industry 4520	0.042	0.073	0.015	28.6	3.250	0.019	0.025	-3.0	-0.380
	(0.201)	(0.261)	(0.122)		(0.001)	(0.135)	(0.156)		(0.703)
No. Obs.	*498*	*232*	*266*			*162*	*162*		
Pseudo R-square						*0.1058*			

Pre-Tax Profit Ratio is pre-tax accounting profit / sales revenue. SIZE is the natural logarithm of sales revenue. There are 498 observations for the full sample, after excluding those with Pre-Tax Profit Ratio greater than 1 or smaller than 0. Propensity score matching based on the logit model in Equation (6.7) generates propensity scores with standard deviation of 0.1862 (rounded to four decimal places). Thus, the appropriate caliper is initially determined at 0.04. With the caliper of 0.04, there is no significant difference between the matched FOACs and DOLACs.

Panel F Income Tax Expense Ratio Sub-Sample									
		Full (Unmatched) Sample				Propensity-Score Matched Sample			
Variables	**All Obs.** Mean (Std. Dev.)	**FOACs** Mean (Std. Dev.)	**DOLACs** Mean (Std. Dev.)	**%bias**	***t*-test** t-statistic (P > |t|)	**FOACs** Mean (Std. Dev.)	**DOLACs** Mean (Std. Dev.)	**%bias**	***t*-test** t-statistic (P > |t|)
Income Tax Expense Ratio	0.031	0.024	0.037	-29	-3.410	0.027	0.034	-15.2	-1.460
	(0.043)	(0.041)	(0.043)		(0.001)	(0.047)	(0.038)		(0.145)
SIZE	12.354	12.691	12.070	40.6	4.690	12.615	12.763	-9.6	-0.960
	(1.586)	(1.182)	(1.813)		(0.000)	(1.200)	(1.726)		(0.336)
Industry 1510	0.136	0.106	0.162	-16.6	-1.930	0.138	0.128	3.1	0.300
	(0.344)	(0.308)	(0.369)		(0.054)	(0.346)	(0.335)		(0.762)
Industry 2010	0.174	0.169	0.179	-2.7	-0.320	0.218	0.223	-1.4	-0.120
	(0.380)	(0.375)	(0.384)		(0.753)	(0.414)	(0.418)		(0.901)
Industry 2020	0.093	0.055	0.126	-24.9	-2.880	0.074	0.064	3.7	0.410
	(0.291)	(0.228)	(0.332)		(0.004)	(0.263)	(0.245)		(0.685)
Industry 2030	0.029	0.024	0.033	-5.8	-0.670	0.032	0.032	0	0.000
	(0.167)	(0.152)	(0.179)		(0.501)	(0.176)	(0.176)		(1.000)
Industry 2510	0.016	0.020	0.013	5	0.590	0.021	0.016	4.2	0.380
	(0.126)	(0.139)	(0.115)		(0.554)	(0.145)	(0.126)		(0.704)
Industry 2520	0.022	0.012	0.030	-12.6	-1.460	0.016	0.021	-3.7	-0.380
	(0.145)	(0.108)	(0.170)		(0.145)	(0.126)	(0.145)		(0.704)
Industry 2540	0.036	0.027	0.043	-8.4	-0.980	0.037	0.037	0	0.000
	(0.186)	(0.164)	(0.203)		(0.325)	(0.190)	(0.190)		(1.000)
Industry 2550	0.165	0.259	0.086	46.9	5.610	0.128	0.138	-2.9	-0.300

	(0.372)	(0.439)	(0.281)		(0.000)	(0.335)	(0.346)		(0.762)
Industry 3020	0.059	0.063	0.056	2.7	0.320	0.074	0.069	2.2	0.200
	(0.236)	(0.243)	(0.231)		(0.748)	(0.263)	(0.254)		(0.842)
Industry 3510	0.072	0.078	0.066	4.7	0.560	0.096	0.085	4.1	0.360
	(0.258)	(0.269)	(0.249)		(0.579)	(0.295)	(0.280)		(0.720)
Industry 3520	0.016	0.016	0.017	-0.7	-0.080	0.021	0.016	4.2	0.380
	(0.126)	(0.125)	(0.128)		(0.935)	(0.145)	(0.126)		(0.704)
Industry 4510	0.061	0.039	0.079	-17.1	-1.980	0.053	0.074	-9.0	-0.840
	(0.240)	(0.194)	(0.271)		(0.048)	(0.225)	(0.263)		(0.400)
Industry 4520	0.052	0.082	0.026	24.8	2.970	0.027	0.043	-7.1	-0.850
	(0.222)	(0.275)	(0.161)		(0.003)	(0.161)	(0.202)		(0.398)
No. Obs.	*557*	*255*	*302*			*188*	*188*		
Pseudo R-square						*0.1012*			

Income Tax Expense Ratio is income tax expense / sales revenue. SIZE is the natural logarithm of sales revenue. There are 557 observations for the full sample, after excluding those with Income Tax Expense Ratio greater than 1 or smaller than 0. Propensity score matching based on the logit model in Equation (6.7) generates propensity scores with standard deviation of 0.1822 (rounded to four decimal places). Thus, the appropriate caliper is initially determined at 0.04. With the caliper of 0.04, there is no significant difference between the matched FOACs and DOLACs.

Appendix N

The following tables show the OLS regression results for the unmatched and matched samples for the robustness check in Chapter 6.

Panel A Dependent Variable: Gross Profit Ratio								
	Full (Unmatched) Sample (418 Obs.)				**Propensity-Score Matched Sample (234 Obs.)**			
	Coef.	Std. Err.	t	P > |t|	Coef.	Std. Err.	t	P > |t|
Constant	0.6679	0.0721	9.27	0.000	0.6285	0.1208	5.2	0.000
FOAC	-0.1100	0.0178	-6.18	0.000	-0.1111	0.0206	-5.4	0.000
SIZE	-0.0233	0.0054	-4.29	0.000	-0.0196	0.0079	-2.47	0.014
Industry 1510	-0.0464	0.0348	-1.33	0.183	-0.0355	0.0510	-0.7	0.487
Industry 2010	-0.0930	0.0346	-2.69	0.008	-0.0970	0.0515	-1.88	0.061
Industry 2020	-0.0325	0.0486	-0.67	0.504	-0.0498	0.0656	-0.76	0.449
Industry 2030	0.1161	0.0791	1.47	0.143	0.1339	0.1002	1.34	0.183
Industry 2510	-0.0824	0.0557	-1.48	0.140	-0.0923	0.0768	-1.2	0.231
Industry 2520	0.0211	0.0523	0.40	0.687	0.0268	0.0829	0.32	0.747
Industry 2540	0.1360	0.0649	2.10	0.037	0.1920	0.0792	2.42	0.016
Industry 2550	0.0546	0.0352	1.55	0.122	0.0675	0.0532	1.27	0.206
Industry 3020	-0.0496	0.0423	-1.17	0.242	-0.0504	0.0584	-0.86	0.390
Industry 3510	0.0746	0.0404	1.84	0.066	0.0742	0.0583	1.27	0.205
Industry 3520	0.1717	0.0593	2.89	0.004	0.2022	0.0830	2.44	0.016
Industry 4510	0.1226	0.0474	2.59	0.010	0.0943	0.0720	1.31	0.191
Industry 4520	-0.0323	0.0459	-0.70	0.482	-0.0561	0.0676	-0.83	0.407
Adjusted R-square	*0.2645*				*0.2484*			

Panel B Dependent Variable: EBIT Ratio								
	Full (Unmatched) Sample (520 Obs.)				Propensity-Score Matched Sample (348 Obs.)			
	Coef.	Std. Err.	t	P > |t|	Coef.	Std. Err.	t	P > |t|
Constant	0.2774	0.0443	6.27	0.000	0.3239	0.0624	5.19	0.000
FOAC	-0.0525	0.0105	-5.01	0.000	-0.0636	0.0111	-5.75	0.000
SIZE	-0.0054	0.0033	-1.64	0.102	-0.0083	0.0041	-2.04	0.043
Industry 1510	0.0231	0.0232	1.00	0.319	0.0102	0.0305	0.33	0.739
Industry 2010	-0.0978	0.0212	-4.62	0.000	-0.1079	0.0281	-3.83	0.000
Industry 2020	-0.0636	0.0242	-2.63	0.009	-0.0590	0.0319	-1.85	0.065
Industry 2030	-0.0680	0.0312	-2.18	0.030	-0.0538	0.0400	-1.35	0.179
Industry 2510	-0.0969	0.0459	-2.11	0.035	-0.0957	0.0528	-1.81	0.071
Industry 2520	-0.0959	0.0356	-2.69	0.007	-0.0662	0.0445	-1.49	0.138
Industry 2540	-0.0543	0.0318	-1.71	0.088	-0.0370	0.0403	-0.92	0.359
Industry 2550	-0.0770	0.0219	-3.52	0.000	-0.0718	0.0303	-2.37	0.018
Industry 3020	-0.1037	0.0276	-3.75	0.000	-0.1049	0.0335	-3.13	0.002
Industry 3510	-0.1107	0.0248	-4.45	0.000	-0.1107	0.0312	-3.55	0.000
Industry 3520	0.0277	0.0395	0.70	0.483	-0.0177	0.0465	-0.38	0.704
Industry 4510	-0.0623	0.0263	-2.37	0.018	-0.0612	0.0341	-1.79	0.074
Industry 4520	-0.1117	0.0302	-3.70	0.000	-0.1253	0.0438	-2.86	0.005
Adjusted R-square	*0.1811*				*0.1667*			

Panel C Dependent Variable: Interest Expense Ratio								
	Full (Unmatched) Sample (672 Obs.)				Propensity-Score Matched Sample (368 Obs.)			
	Coef.	Std. Err.	t	P > |t|	Coef.	Std. Err.	t	P > |t|
Constant	0.0532	0.0154	3.44	0.001	0.0501	0.0198	2.53	0.012
FOAC	0.0114	0.0040	2.82	0.005	0.0098	0.0041	2.38	0.018
SIZE	-0.0045	0.0011	-3.97	0.000	-0.0045	0.0015	-3.05	0.002
CAPINT	0.0677	0.0085	8.01	0.000	0.0693	0.0108	6.40	0.000
Industry 1510	-0.0025	0.0079	-0.32	0.747	-0.0112	0.0098	-1.15	0.252
Industry 2010	-0.0151	0.0079	-1.90	0.058	-0.0115	0.0100	-1.15	0.251
Industry 2020	-0.0179	0.0088	-2.04	0.041	-0.0105	0.0111	-0.94	0.347
Industry 2030	0.0041	0.0123	0.33	0.740	-0.0080	0.0135	-0.60	0.552
Industry 2510	-0.0204	0.0143	-1.43	0.153	-0.0194	0.0197	-0.98	0.326
Industry 2520	-0.0090	0.0125	-0.72	0.473	0.0050	0.0158	0.32	0.750
Industry 2540	-0.0169	0.0111	-1.52	0.130	-0.0140	0.0139	-1.01	0.312
Industry 2550	-0.0154	0.0083	-1.85	0.065	-0.0163	0.0103	-1.58	0.116
Industry 3020	-0.0097	0.0098	-0.99	0.322	0.0023	0.0116	0.20	0.843
Industry 3510	-0.0166	0.0095	-1.75	0.080	-0.0098	0.0131	-0.75	0.456
Industry 3520	-0.0133	0.0146	-0.91	0.365	0.0084	0.0171	0.49	0.625
Industry 4510	-0.0211	0.0096	-2.21	0.028	-0.0137	0.0120	-1.15	0.253
Industry 4520	-0.0157	0.0110	-1.42	0.156	-0.0169	0.0146	-1.15	0.249
Adjusted R-square	*0.1496*				*0.1517*			

Panel D Dependent Variable: Leverage								
	Full (Unmatched) Sample (669 Obs.)				Propensity-Score Matched Sample (362 Obs.)			
	Coef.	Std. Err.	t	P > |t|	Coef.	Std. Err.	t	P > |t|
Constant	-0.3168	0.0412	-7.70	0.000	-0.2610	0.0599	-4.36	0.000
FOAC	0.0121	0.0107	1.13	0.259	-0.0049	0.0133	-0.37	0.710
SIZE	0.0181	0.0030	5.99	0.000	0.0134	0.0047	2.88	0.004
CAPINT	0.2581	0.0225	11.46	0.000	0.3122	0.0343	9.11	0.000
Industry 1510	0.0550	0.0210	2.62	0.009	0.0441	0.0302	1.46	0.145
Industry 2010	0.0727	0.0212	3.43	0.001	0.0702	0.0306	2.29	0.023
Industry 2020	0.0666	0.0234	2.85	0.005	0.0675	0.0370	1.82	0.069
Industry 2030	0.1096	0.0325	3.37	0.001	0.0771	0.0442	1.74	0.082
Industry 2510	0.0309	0.0379	0.82	0.415	0.0437	0.0577	0.76	0.449
Industry 2520	0.1064	0.0333	3.20	0.001	0.1075	0.0473	2.27	0.024
Industry 2540	0.0625	0.0295	2.12	0.035	0.0328	0.0411	0.8	0.426
Industry 2550	0.0530	0.0223	2.38	0.018	0.0337	0.0321	1.05	0.295
Industry 3020	0.1083	0.0260	4.17	0.000	0.0924	0.0351	2.64	0.009
Industry 3510	0.0739	0.0252	2.93	0.004	0.0539	0.0386	1.4	0.163
Industry 3520	0.0828	0.0387	2.14	0.033	0.1160	0.0510	2.28	0.024
Industry 4510	0.0530	0.0255	2.08	0.038	0.0262	0.0382	0.69	0.494
Industry 4520	0.0831	0.0293	2.84	0.005	0.0964	0.0465	2.07	0.039
Adjusted R-square	*0.2785*				*0.3011*			

Panel E Dependent Variable: Pre-Tax Profit Ratio								
	Full (Unmatched) Sample (498 Obs.)				Propensity-Score Matched Sample (324 Obs.)			
	Coef.	Std. Err.	t	P > |t|	Coef.	Std. Err.	t	P > |t|
Constant	0.2810	0.0455	6.17	0.000	0.2469	0.0642	3.84	0.000
FOAC	-0.0447	0.0107	-4.16	0.000	-0.0377	0.0119	-3.15	0.002
SIZE	-0.0063	0.0034	-1.87	0.062	-0.0042	0.0044	-0.97	0.333
Industry 1510	0.0207	0.0234	0.88	0.378	0.0005	0.0292	0.02	0.986
Industry 2010	-0.1003	0.0212	-4.72	0.000	-0.0930	0.0251	-3.71	0.000
Industry 2020	-0.0727	0.0244	-2.98	0.003	-0.0836	0.0316	-2.65	0.009
Industry 2030	-0.0956	0.0330	-2.90	0.004	-0.0735	0.0367	-2.00	0.046
Industry 2510	-0.1038	0.0458	-2.27	0.024	-0.0804	0.0580	-1.39	0.167
Industry 2520	-0.1159	0.0356	-3.26	0.001	-0.0947	0.0420	-2.26	0.025
Industry 2540	-0.0682	0.0323	-2.11	0.035	-0.0687	0.0372	-1.84	0.066
Industry 2550	-0.0822	0.0218	-3.76	0.000	-0.0674	0.0273	-2.47	0.014
Industry 3020	-0.1139	0.0285	-4.00	0.000	-0.1116	0.0331	-3.37	0.001
Industry 3510	-0.1151	0.0249	-4.62	0.000	-0.1119	0.0304	-3.68	0.000
Industry 3520	0.0216	0.0394	0.55	0.585	-0.0166	0.0488	-0.34	0.734
Industry 4510	-0.0621	0.0265	-2.34	0.019	-0.0757	0.0323	-2.34	0.020
Industry 4520	-0.1096	0.0306	-3.58	0.000	-0.1056	0.0470	-2.25	0.025
Adjusted R-square	*0.1757*				*0.0813*			

Panel F Dependent Variable: Income Tax Expense Ratio								
	Full (Unmatched) Sample (557 Obs.)				Propensity-Score Matched Sample (376 Obs.)			
	Coef.	Std. Err.	t	P > |t|	Coef.	Std. Err.	t	P > |t|
Constant	0.0853	0.0150	5.68	0.000	0.0915	0.0219	4.19	0.000
FOAC	-0.0084	0.0036	-2.33	0.020	-0.0074	0.0041	-1.80	0.072
SIZE	0.0000	0.0011	0.04	0.971	0.0003	0.0015	0.21	0.836
Industry 1510	-0.0358	0.0079	-4.56	0.000	-0.0483	0.0102	-4.74	0.000
Industry 2010	-0.0613	0.0076	-8.09	0.000	-0.0705	0.0096	-7.35	0.000
Industry 2020	-0.0536	0.0084	-6.35	0.000	-0.0665	0.0116	-5.75	0.000
Industry 2030	-0.0606	0.0118	-5.14	0.000	-0.0686	0.0143	-4.81	0.000
Industry 2510	-0.0669	0.0147	-4.54	0.000	-0.0747	0.0175	-4.28	0.000
Industry 2520	-0.0625	0.0131	-4.76	0.000	-0.0719	0.0174	-4.14	0.000
Industry 2540	-0.0426	0.0110	-3.88	0.000	-0.0529	0.0137	-3.85	0.000
Industry 2550	-0.0557	0.0077	-7.19	0.000	-0.0630	0.0104	-6.09	0.000
Industry 3020	-0.0648	0.0094	-6.87	0.000	-0.0744	0.0115	-6.48	0.000
Industry 3510	-0.0629	0.0090	-7.00	0.000	-0.0715	0.0110	-6.51	0.000
Industry 3520	-0.0359	0.0147	-2.45	0.015	-0.0456	0.0173	-2.63	0.009
Industry 4510	-0.0519	0.0094	-5.54	0.000	-0.0662	0.0119	-5.58	0.000
Industry 4520	-0.0650	0.0099	-6.57	0.000	-0.0754	0.0143	-5.27	0.000
Adjusted R-square	*0.1478*				*0.1408*			

Gross Profit Ratio is (sales revenue – cost of goods sold) / sales revenue. EBIT Ratio is (pre-tax accounting profit + interest expense) / sales revenue. Interest Expense Ratio is interest expense / sales revenue. Leverage is long-term borrowings / total assets. Pre-Tax Profit Ratio is pre-tax accounting profit / sales revenue. Income Tax Expense Ratio is income tax expense / sales revenue. SIZE is the natural logarithm of sales revenue. CAPINT is non-current assets / total assets. FOAC is an indicator which takes the value of 1 if the company is a FOAC, and 0 otherwise.