UTS UNIVERSITY OF TECHNOLOGY SYDNEY

The incentives for tax avoidance in Australia

by Mikhail Shashnov

Thesis submitted in fulfilment of the requirements for the degree of

Doctor of Philosophy

under the supervision of A/P Roman Lanis,
Prof. Peter Wells, Dr. Brett Govendir, Dr. Greg Pazmandy,
Prof. Grant Richardson.

University of Technology Sydney
Faculty of Business

April 2025

Certificate of original authorship

I, Mikhail Shashnov, declare that this thesis is submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the Accounting Discipline Group of Business School at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

This document has not been submitted for qualifications at any other academic institution.

This research was supported by an Australian Government Research Training Program (RTP) Scholarship doi.org/10.82133/C42F-K220.

……

Mikhail Shashnov

April 17, 2025

Abstract

This thesis investigates the global issue of corporate tax avoidance (CTA) and its implications for government tax revenues. It examines whether after-tax performance targets embedded in executive compensation contracts incentivise managers to adopt aggressive tax strategies, even when such behaviour offers no benefit to shareholders. The findings reveal that firms employing after-tax performance measures are more inclined to engage in aggressive tax planning, particularly those with higher profitability. This result underscores how executive compensation can influence corporate tax behaviour, revealing that certain performance targets may drive managers to pursue strategies that are misaligned with shareholder interests. The analysis then turns to the Multinational Anti-Avoidance Law (MAAL) and Diverted Profits Tax (DPT), introduced by the Australian Federal Government, with particular attention to whether these measures have had a sustained impact on constraining CTA among foreign significant global entities (SGEs) operating in Australia and especially in light of the 'PwC scandal'. The findings suggest that Australia's unilateral strategies to constrain CTA appear to be relatively short-lived. These results imply that such legislative policies function more as constraints than as deterrents, potentially serving only to increase the costs associated with tax avoidance, as the incentives for CTA are likely to persist.

Acknowledgements

I am deeply grateful to my supervisors – Associate Professor Roman Lanis, Professor Peter Wells, Dr Brett Govendir, Dr Greg Pazmandy, and Professor Grant Richardson – for their invaluable support throughout this research journey. Their expertise and mentorship were instrumental in shaping this thesis, and I particularly appreciate the balance they struck: granting me the freedom to explore ideas independently while offering thoughtful challenges that sharpened my thinking and deepened my expertise.

The guidance, insights, and support from members of the Accounting Discipline Group created a collaborative and stimulating environment that significantly enriched my research journey. The constructive feedback and thoughtful critiques received during presentations enhanced my understanding of the thesis topic and encouraged me to explore the existing literature more thoroughly and approach issues from new perspectives.

I am extremely grateful to my parents, Olga and Sergey, for their unwavering patience, support, and understanding over the past four years. I am especially thankful to my mum, Olga, whose compassion and calming presence were a constant source of comfort during challenging times. I would also like to thank my long-time friend Dr Natalie Brand, whose invaluable support, insights, knowledge, and encouragement were especially meaningful during the early stages of my research journey.

Undertaking a PhD has been one of the most fulfilling and intellectually transformative experiences of my career. I would also like to extend my sincere thanks to all those who generously shared their time, insights, and encouragement throughout this research journey.

Table of Contents

Certificate of original authorship ..... **ii**

Abstract ..... **iii**

Acknowledgements ..... **iv**

List of tables ..... **vii**

List of figures ..... **viii**

Appendices ..... **ix**

List of abbreviations ..... **x**

Chapter 1 ..... **1**

Introduction **1**

1.1 Research objectives 2

1.2 Motivation 4

1.3 Main findings 6

1.4 Contributions 7

1.5 Structure of thesis 8

Chapter 2 ..... **10**

The impact of after-tax performance targets in management compensation contracts on corporate tax avoidance **10**

2.1 Introduction 11

2.2 Literature and hypothesis development 14

2.2.1 Incentives for corporate tax avoidance 14

2.2.2 Shareholder incentives for corporate tax avoidance with dividend imputation 18

2.3 Research design 20

2.4 Sample and data description 23

2.4.1 Sample identification 23

2.4.2 Sample description 26

2.4.3 Performance measures: before or after tax 27

2.5 Results 30

2.5.1 Corporate tax avoidance and performance targets in compensation contracts (H_1) 30

2.5.2 Additional analysis 33

2.6 Conclusion 36

Chapter 3 ..... **57**

Did the positive impact of legislative strategies to constrain multinational corporate tax avoidance survive the 'PwC tax scandal'? **57**

3.1 Introduction 58

3.2 Regulatory context and hypotheses 64

3.2.1 Legislative strategy for constraining CTA in Australia 67
3.2.2 Hypotheses 69
3.3 Research design 72
3.4 Sample and data description 76
3.4.1 Sample firms 76
3.4.2 Data description and descriptive statistics 78
3.5 Results 83
3.6 Conclusion 93
Chapter 4 111
Conclusion 111
4.1 Conclusions 112
4.2 Limitations and areas of future research. 115
References. 117

List of tables

Chapter 2

Table 2.1 Tax accruals across multiple periods 18
Table 2.2 Definition of variables used in this chapter 22
Table 2.3 Descriptive statistics for continuous variables used in this chapter. 27
Table 2.4 Determinates of performance measures in management compensation contracts 29
Table 2.5 The impact of management compensation contracts on corporate tax avoidance – Effective tax rates (3%-33%) 31
Table 2.6 The impact of management compensation contracts on corporate tax avoidance – Effective tax rates (additional analysis) 33
Table 2.7 The impact of management compensation contracts on corporate tax avoidance – Effective tax rates (0%-39%) 34
Table 2.8 The impact of management compensation contracts on corporate tax avoidance – Effective tax rates (+/- 3s.d.) 35

Chapter 3

Table 3.1 Sample Firms – Revenues 79
Table 3.2 Sample Firms – Taxes 80
Table 3.3 Descriptive Statistics – Revenues 82
Table 3.4 Descriptive Statistics – Taxes 83
Table 3.5 Impact of avoidance strategies on revenue recognition 84
Table 3.6 Impact of avoidance strategies on revenue recognition (extended sample) 87
Table 3.7 Impact of avoidance strategies on taxes payable 89
Table 3.8 Impact of avoidance strategies on tax rates. 92

List of figures

Chapter 2 – Appendix A

Figure A2.1 Histogram. Full sample (N = 3,073), where pre-tax income (PI) >= 0. 39
Figure A2.2 Boxplot. Full sample (N = 3,073). 40
Figure A2.3 Histogram. Requirement: ETR >= 0 and ETR < =1 and PI >= 0. (N = 3,026). 41
Figure A2.4 Histogram. Requirement: ETR >= 0 and ETR <= 0.5 and PI >= 0. (N = 2,858). 42
Figure A2.5 Histogram. Requirement: mean ETR +/- 3 SD & PI >= 0. (N = 2,858). 43
Figure A2.6 Histogram. Requirement: median ETR +/- 3 MAD & PI >= 0. (N = 2,638). 44
Figure A2.7 Histogram. Full Sample (N = 3,073), where pre-tax income (PI) >= 0. 47
Figure A2.8 Boxplot. Full Sample (N = 3,073). 48
Figure A2.9 Histogram. Requirement: CETR >= 0 and CETR <= 1 and PI >= 0. (N = 2,999). 49
Figure A2.10 Histogram. Requirement: CETR >= 0 and CETR <= 0.5 and PI >= 0. (N = 2,793). 50
Figure A2.11 Histogram. Requirement: mean CETR +/- 3 sd & PI >= 0. (N = 2,793). 51
Figure A2.12 Histogram. Requirement: median CETR +/- 3 mad & PI >= 0. (N = 2,618). 52

Appendices

Chapter 2

Appendix A – Sample Selection.....38
2A.1 Sample Selection for ETR.....38
Appendix A.1 Descriptive statistics for ETR.....39
Appendix A.2. Results of regression analysis for ETR.....45
Appendix A.3. Results of regression analysis for ETR (additional ranges).....46
2A.2 Sample Selection for CETR.....46
Appendix A.4 Descriptive statistics for CETR.....48
Appendix A.5. Results of regression analysis for CETR.....53
Appendix A.6. Results of regression analysis for CETR (additional ranges).....54
Appendix A.7 Detailed sample derivation.....55
Appendix A.8 Two-sample t-test for ETR (*BeforeTax* vs *AfterTax* subsamples).....56

Chapter 3

Appendix B.....98
Appendix B.1 PwC tax scandal history timeline.....98
Appendix B.2 Definitions of variables.....99
Appendix B.3 Descriptive statistics and t-tests for change in revenues, taxes payable, and tax rate for SGE and non-SGE firms.....100
Appendix B3.1 Descriptive statistics: revenues for SGE and non-SGE firms.....100
Appendix B3.2 t-tests for changes in revenues within and between groups.....103
Appendix B3.3 Descriptive statistics: taxes payable for SGE and non-SGE firms.....104
Appendix B3.4 t-tests for changes in taxes payable within and between groups.....107
Appendix B3.5 Descriptive statistics: tax rates for SGE and non-SGE firms.....108
Appendix B3.6 t-tests for changes in tax rates within and between groups.....110

List of abbreviations

AFP – Australian Federal Police

APRA – Australian Prudential Regulation Authority

AR – Autoregressive model

ASIC – Australian Securities and Investments Commission

ATO – Australian Tax Office

BEPS – Base Erosion and Profit Shifting

CETR – Cash Effective Tax Rate

CTA – Corporate Tax Avoidance

DiD – Difference-in-Differences

DPT – Diverted Profits Tax

ETR – Effective Tax Rate

MAAL – Multinational Anti-Avoidance Law

MNC – Multinational Corporation

OECD – Organisation for Economic Co-operation and Development

PI – Pre-tax Income

SGE – Significant Global Entity

TPB – Tax Practitioners Board

Chapter 1

Introduction

1.1 Research objectives

A major issue for governments around the world is the incidence of corporate tax avoidance (CTA) and the impact this has on government revenues. As a consequence, much attention has been directed determining the incentives for CTA and strategies to mitigate this problem. Building upon a significant literature, consideration in this thesis is first given to the incentives for CTA, and in particular those created by management compensation contracts. This is important because unless the incentives for CTA are constrained any strategy is unlikely to be successful in the long term. This is then considered in the context of the Multinational Anti-Avoidance Law (MAAL) and Diverted Profits Tax (DPT) enacted by the Australian Federal Government. Of particular concern is the persistence of the impact of these strategies to constrain CTA behaviour of foreign Significant Global Entities (SGEs).

Understanding the incentives for CTA is critical to any consideration of strategies to constrain CTA, and whether they will persist. Consideration has been given in the literature to the use of measures of profit in executive compensation contracts, however there are in most cases difficulties in distinguishing management and shareholder incentives. To address this, Chapter 2 examines whether performance targets in executive compensation contracts influence CTA. It focuses on Australian firms that distribute dividends with tax credits, where shareholder incentives for tax avoidance are largely reduced.[1] In this context, after-tax performance targets could motivate managers to pursue aggressive tax strategies where there are no benefits for shareholders. The assessment of the association between performance targets and CTA is often challenging due to the diverse motivations for CTA for both shareholders and managers (Desai & Dharmapala, 2006). However, in a dividend imputation system, where firms distribute dividends with imputation credits, shareholder incentives for tax

[1] Nonetheless, they are not entirely absent, as foreign shareholders are generally unable to benefit from franking credits because these can only be used to offset Australian income tax liabilities.

avoidance are significantly diminished (McClure et al., 2018). This unique context allows for a clearer evaluation of managerial incentives for aggressive tax strategies, minimizing confounding factors that typically complicate such analysis (e.g., Desai & Dharmapala, 2006; Powers et al., 2016). While the research focuses on Australia, the underlying incentives for CTA – particularly those related to after-tax performance measures – are relevant internationally, making the findings broadly applicable.

A challenge for strategies to constrain CTA is that if the incentives for CTA persist, then it is likely that firms will endeavour to circumvent the strategies. Hence, in chapter 3, this thesis explores the broader question of whether unilateral legislative strategies like MAAL and DPT can deliver long-term effectiveness in constraining CTA. These strategies primarily restrict tax avoidance without addressing its underlying incentives – such as through mechanisms like dividend imputation – which can lead to the emergence of counter strategies soon after implementation. The 'PwC tax scandal' serves as a stark example of how persistent CTA incentives can undermine tax enforcement efforts. For legislation to be truly effective, it must strike a delicate balance – being both precise enough to be legally enforceable and robust enough to withstand judicial scrutiny. Without this balance, alternative tax avoidance schemes are likely to develop, ultimately diminishing the intended impact of such legislative strategies.

Australia offers a unique setting for analysis for three key reasons. First, since 2014, the Australian Taxation Office (ATO) has been required to publicly disclose corporate tax return data for companies with a total income exceeding $100 million, including total income, taxable income, and tax payable, under the Tax Laws Amendment (2013 Measures No.2) Act 2013. Second, Australia is distinct in its adoption of two unilateral legislative strategies, MAAL and DPT, specifically designed to increase declared total income and tax payable. This allows for a direct evaluation of MAAL and DPT's effectiveness using ATO tax return data, eliminating the need for proxy measures like effective tax rate (ETR). Lastly, the 2023 PwC tax scandal

exposed that efforts to circumvent these anti-avoidance measures were already in motion well before their implementation, reinforcing the notion that incentives for CTA remained and were actively pursued. Given these distinctive factors and building on the findings of Wells et al. (2024), chapter 3 employs ATO tax return data to assess the long-term impact of MAAL and DPT, several years post-implementation, particularly in light of the persistence of CTA incentives, as demonstrated by the PwC tax scandal. Additionally, this research incorporates insights from mass media reports, Senate inquiries and meetings, and investigations conducted by the ATO, the Tax Practitioners Board, and the Australian Federal Police (AFP) into the PwC tax scandal to provide a comprehensive analysis of the effectiveness of these legislative strategies.

1.2 Motivation

CTA remains a significant political and public concern worldwide, particularly due to its impact on government revenues. In Australia, the inaugural Corporate Transparency Report for 2013/14 revealed that 36% of the largest public and multinational corporations (MNCs) paid no tax that year (Hutchens, 2016). Although this figure declined to 31% in 2022/23 (ATO, 2024a), many of these corporations still generated billions in gross revenues.

The primary motivation for this thesis is to investigate whether management compensation contracts encourage CTA. Understanding this is crucial, as public and political concerns continue to grow over the tax strategies used by large corporations and their impact on government finances. A notable example is the 25% decline in corporate tax contributions to total U.S.A. tax revenues between 1996 and 2012 (Levin, 2013). Investigating the role of executive compensation in shaping corporate tax behaviour would provide valuable insights into this ongoing debate.

Exploring the broader economic implications of using accounting information in financial contracts is the secondary motivation. The role of accounting data in management compensation contracts has been widely studied, particularly in relation to earnings management through accrual manipulation (Healy, 1985; Holthausen et al., 1995) and real activities (Bartov, 1993). However, it remains unclear whether CTA functions as an additional tool for managing earnings, representing yet another economic consequence of using accounting information in executive compensation contracts.

Additionally, efforts to introduce legislative measures to combat CTA in Australia have intensified over the past decade. Therefore, this thesis also examines tax avoidance by MNCs, focusing on two unilateral legislative strategies put in place by the Australian Federal Government. The first is the Tax Laws Amendment (Combating Multinational Tax Avoidance) Act 2015, widely known as the Multinational Anti-Avoidance Law (MAAL). The second is the Treasury Laws Amendment (Combating Multinational Tax Avoidance) Act 2017, commonly referred to as the Diverted Profits Tax (DPT).

MAAL was introduced to constrain tax avoidance strategies used by SGEs by ensuring they pay tax on their actual profits earned in Australia rather than shifting revenue to lower tax jurisdictions. This legislation applies to income years starting on or after 1 January 2016. The DPT, on the other hand, aims to ensure that the tax paid by SGEs accurately reflects their economic activities within Australia, preventing profit shifting through related-party arrangements. With a 40% tax rate, substantially higher than the 30% standard corporate tax rate, the DPT serves as a deterrent against diverting profits offshore to lower tax jurisdictions.

Prior research has found that the Australian Federal Government's unilateral legislative strategies, MAAL and DPT, were initially effective in reducing CTA by MNCs within the first year of their implementation (Wells et al., 2024). However, the PwC tax scandal highlights that these measures did not eliminate the incentive for CTA, as new strategies to circumvent these

laws emerged shortly after (Queensland Law Society, 2024). Therefore, this thesis in chapter 3 examines whether the impact of MAAL and DPT persisted beyond the initial findings of Wells et al. (2024). Motivating this investigation stems from the intense media scrutiny surrounding the PwC tax scandal. It concerns PwC's dual role as an adviser. PwC was advising the government on tax policy, in particular, regarding MAAL and DPT, while simultaneously advising MNCs on tax avoidance strategies (Tadros & Chenoweth, 2023). This potential conflict of interest has been widely debated in the media (Ainsworth, 2023; Chenoweth, 2023; Tadros & Chenoweth, 2023). The key allegation is that PwC may have leveraged its position as a consultant in shaping MAAL and DPT to later assist MNCs in circumventing these regulations (Tadros & Chenoweth, 2023). Consequently, there is concern that the initial success of MAAL and DPT in constraining CTA may have been short-lived, as evidenced by the PwC tax scandal (Tadros & Chenoweth, 2023).

1.3 Main findings

Key findings from this research provide evidence that firms with after-tax performance incentives adopt aggressive tax strategies, for which there is little benefit to shareholders. This is especially so for the more profitable firms. The research also provides empirical support that tax avoidance serves as a tool for earnings management, extending prior research that has primarily focused on accrual-based and real earnings management. Additionally, the findings indicate that corporate governance has limited influence on ensuring performance targets are set efficiently. A likely explanation is the widespread adoption of independent boards and chairs in Australian firms since the Australian Securities Exchange issued its Principles of Good Corporate Governance and Practice recommendations.

Other significant findings from this research seemingly indicate that while foreign SGEs in Australia initially reported higher tax revenues following the enactment of the legislation (Wells et al., 2024), this seems to have declined in subsequent years. One possible explanation is that the CTA strategy linked to the PwC tax scandal introduced new schemes to allocate revenues to lower tax jurisdictions outside Australia, thereby bypassing MAAL. Additionally, albeit unreported, anecdotal insights from tax professionals further support this claim. Similarly, while foreign SGE firms experienced an initial increase (after one year) in taxes paid after the legislation's implementation (Wells et al., 2024), this seemingly declined in the following year (after two years). In combination these findings provide preliminary evidence that Australia's unilateral strategies to constrain CTA seemingly have had only a short-term impact. However, further and more robust cross-sectional analysis that entails additional data collection is required to provide evidence that revenues and taxes paid indeed declined in relation to the consequences of the PwC scandal.

1.4 Contributions

This thesis makes a number of contributions to the incentives for tax avoidance literature. Chapter 2 offers insights into the broader economic implications of incorporating accounting information in executive compensation structures. Thereby, it enhances the understanding of CTA by providing robust evidence on the incentives created by after-tax performance targets in management compensation contracts. Importantly, this identifies CTA being used to increase reported earnings when this would be expected to impact management performance evaluation. As such it represents a further economic consequence of accounting information being used for financial contracting. Additionally, the public revelations of the PwC tax scandal in 2023 provides preliminary evidence that, despite the implementation of

some of the most comprehensive unilateral anti-avoidance legislative strategies, their effectiveness in constraining incentives for tax avoidance seems to have been short-lived. This aligns with the widely held view that tax consultants and MNCs frequently stay ahead of tax authorities in developing tax avoidance schemes. In Australia, the conflict of interest surrounding the PwC tax scandal potentially accelerated the creation of strategies to circumvent MAAL and DPT, seemingly emerging just one year after their implementation. Consequently, policymakers must take these challenges into account when formulating new unilateral anti-avoidance strategies to improve their long-term resilience. Additional data and the use of more robust cross-sectional analysis will be required to provide conclusive evidence as to the impact of the PwC tax scandal on the long-term effectiveness of MAAL and DPT.

Another contribution of this research is that its findings offer broader insights applicable to all types of anti-avoidance legislative strategies. Specifically, the conflict of interest stemming from PwC's role in both drafting the legislation and later advising on strategies to circumvent MAAL and DPT raises wider concerns. This issue mirrors the conflicts seen in jurisdictions that facilitate CTA while participating in the development of multilateral tax policies.

1.5 Structure of thesis

The remaining sections of this thesis are structured as follows. In Chapter 2, a detailed discussion of the incentives for CTA, along with the research design, sample description, and empirical findings on the impact of after-tax targets in management compensation contracts on CTA are provided. The results are further validated through sensitivity tests using alternative variable ranges of CTA. In Chapter 3, an in-depth discussion of Australia's anti-avoidance legislation, the regulatory context, and the PwC tax scandal is included. Furthermore, chapter

3 contains a description of the research design and an analysis of empirical results, highlighting the impact of legislative measures on CTA, with findings presented for revenues, tax payable, and rates over a three-year period.

Chapter 2

The impact of after-tax performance targets in management compensation contracts on corporate tax avoidance

2.1 Introduction

This chapter aims to evaluate the extent to which after-tax performance targets in management compensation contracts create an incentive for management to engage in corporate tax avoidance (CTA). Evaluating this is in most instances difficult due to the diversity of incentives for CTA for both shareholders and managers (Desai & Dharmapala, 2006). However, in a context with dividend imputation, where firms pay dividends with imputation credits, the shareholder incentives for CTA are greatly diminished (McClure et al., 2018). Critically, this enables the evaluation of incentives for managers to adopt aggressive corporate tax strategies, relatively unconfounded, and in a manner which is often difficult in other circumstances (e.g., Desai & Dharmapala, 2006; Powers et al., 2016). Whilst focused on an Australian context, the incentives for CTA considered (i.e., after tax performance measures) exist internationally, and hence the results would be generalisable globally.

The primary motivation for this chapter is to provide insights into whether management compensation contracts create an incentive for CTA. It is important to understand this because there are increasing public and political concerns about the tax strategies being employed by large firms, and the impact these strategies are having on government finances. Evidence of this impact is a decline in corporate contributions to total tax revenues in the U.S.A. by approximately 25%, for the period 1996 to 2012 (Levin, 2013). Understanding the role of management compensation contracts in providing incentives for CTA would contribute significantly to the public discussion of this issue.

A secondary motivation for this chapter is to further consider the economic consequences of accounting information being used in financial contracting. The use of accounting information in management compensation contracts has received considerable attention and this has identified earnings management through accruals manipulation (Healy, 1985; Holthausen et al., 1995) and real activities (Bartov, 1993). An unresolved issue is

whether CTA is an additional mechanism for managing earnings, and thus a further economic consequence of the use of accounting information in management compensation contracts (i.e., real effects).

Based on a sample of Australian firms paying dividends with imputation credits over the period 2004 to 2019 there is evidence that these firms (60.4%) generally adopt before tax performance measures in compensation contracts. However, there are a material number of firms adopting after tax performance measures and the implications of this can be robustly evaluated. When attention is directed at CTA it is notable that there is only limited evidence of CTA across sample firms. This is expected as there are few shareholder incentives for CTA for these firms and the incidence of taxation is consistent with that reported in McClure et al. (2018). It also confirms the relevance of this sample for evaluating the extant research question.

Relative to firms with before tax performance measures, firms with after tax performance measures adopt more aggressive tax strategies. Furthermore, this result is more pronounced when firm profitability is higher. An unresolved issue is whether or how after-tax performance targets are determined (e.g., are adjustments made at the statutory rate), hence the evaluation of this situation is beyond the scope of this chapter. Irrespective, greater tax avoidance would increase reported after-tax earnings which is relevant for evaluating management performance contracts where after-tax targets are adopted. There is little evidence of this practice being impacted by effective corporate governance.

These results contribute to the CTA literature in a number of ways. First, in the CTA literature, limited attention has been directed at the incentives for managers to engage in CTA (Crocker & Slemrod, 2005; Newman, 1989; Powers et al., 2016; Rego & Wilson, 2012). However, there are several limitations in this literature. It is common to assume that the incentives for CTA created by management compensation contracts are consistent and not impacted by whether performance targets are before or after tax (e.g., Desai & Dharmapala,

2006). Alternatively, attention is focused on firms adopting after tax targets, and reliance is placed on controls for 'known and observable' determinants of the adoption of after tax performance targets (Gaertner, 2014). This is less problematic in a context with dividend imputation as the shareholder incentives for CTA are ameliorated for firms paying dividends with tax credits (McClure et al., 2018). Accordingly, this chapter extends the literature by providing robust evidence of the incentives for CTA created by after tax performance targets in management compensation contracts.

Second, insights are provided into the economic consequences of using accounting information in management compensation contracts. This extends the literature considering earnings management undertaken through accruals manipulation (Healy, 1985; Holthausen et al., 1995) and real activities (Bartov, 1993), and extends this to include CTA (Desai & Dharmapala, 2009). Importantly, this identifies CTA being used to increase reported earnings when this would be expected to impact management performance evaluation. As such it represents a further economic consequence of accounting information being used for financial contracting.

Third, further evidence is provided on whether effective corporate governance impacts corporate tax strategies and maximises shareholder value. A challenge in evaluating the impact of corporate governance is that there has been an increasing homogenisation of corporate governance in recent periods, especially in Australia for firms meeting the sample selection criteria. This suggests that the impact of corporate governance will be contingent on the sample characteristics (time periods and firms) with a significant risk of omitted correlated variables. This might explain equivocal results in the literature.

Finally, the results in this chapter provide insights in the evaluation of CTA. The results in this chapter are sensitive to the inclusion of observations where the measure of CTA is likely impacted by error. Furthermore, in additional analysis it was shown the support for the

hypothesis was attributable to more profitable firms. However, this result is potentially problematic as firms reporting poor performance are more likely to be recognising non-deductible expenditure (e.g., impairment of goodwill) that would cause error in the measure of CTA and bias against finding a result for these firms. Accordingly, evaluation of measures of CTA and the likely incidence of measurement error requires further investigation.

The remainder of this chapter is organised as follows. In section 2 the relevant literature is reviewed, and this culminates in the development of hypotheses. The research design is outlined in section 3. Sample selection and description are addressed in section 4 and the results presented in section 5. Finally, the conclusions are presented in section 6.

2.2 Literature and hypothesis development

2.2.1 Incentives for corporate tax avoidance

There are increasing concerns, both public and political, about the tax strategies being adopted by large corporations that are leading to a reduction in corporate tax payments. This is having a material impact on government budgets, in Australia and globally, and there have been a number of responses. In Australia this includes legislative measures constraining the mechanisms commonly used by corporations (e.g., *Tax Laws Amendment (Combating Multinational Tax Avoidance) Act, 2015* and the *Treasury Laws Amendment (Combating Multinational Tax Avoidance) Act, 2017*). However, these responses might be considered *ad hoc* and a limitation is that they focus on particular tax strategies. Developing more comprehensive responses will probably require a better understanding of the motivations for CTA. Doubtless this concern underpinned calls in Hanlon and Heitzman (2010) for an increased focus on the incentives for CTA.

When the incentives for CTA are considered, attention is generally focused on the costs and benefits for shareholders. Evidencing this is a range of benefits that have been identified, including increased cash and liquidity (Saavedra, 2013) together with increased after tax profits and earnings per share (Hanlon & Slemrod, 2009). These strategies are in the best interests of shareholders as long as the marginal benefits exceed the marginal costs of adopting aggressive tax strategies (Hanlon & Heitzman, 2010). These costs would include implementation costs (Rego & Wilson, 2012; Wilson, 2009), as well as costs arising from detection including political and regulatory costs (Hoi et al., 2013), financial penalties and firm reputational damage (Desai & Dharmapala, 2006; Hanlon & Slemrod, 2009; Lanis & Richardson, 2013). Supporting this focus on shareholders is the assumption that management extract the benefits of CTA from government on behalf of shareholders (Rego & Wilson, 2012).

More limited attention has been focused on management incentives for CTA. This has identified potential reputational consequences arising from management adopting aggressive tax strategies, although there is equivocal evidence on whether this gives rise to costs or benefits. There are claims that the adoption of aggressive tax strategies by management is reputation enhancing as this is demonstrably in the interests of shareholders. However, there are also potentially significant reputational costs for management from the adoption of aggressive tax strategies if this results in enforcement actions (Chen & Chu, 2005).

There is also some recognition that performance measures in management compensation may impact the incidence of CTA.[2] Most obviously the adoption of after tax performance measures in incentives in management compensation would contribute to the alignment of shareholders and managers incentives for CTA (Crocker & Slemrod, 2005).

[2] An example of how after-tax performance measures may influence CTA is when managers accelerate deductions to reduce taxable income in the current period, thereby increasing after-tax reported earnings. For instance, they might bring forward discretionary expenses such as advertising or research and development costs or utilise accelerated depreciation allowances to lower taxable income in the current year. Such actions increase after-tax performance within the remuneration evaluation period, enhancing the likelihood that reported earnings fall within the bonus range specified in the compensation contract.

However, evidence of firms adopting after tax performance measures is equivocal. For example, Newman (1989) finds that only firms with international operations where there are greater opportunities to engage in CTA are more likely to adopt after tax performance measures. Whether this reflects a strategy for excluding from performance targets items that are not controllable and may not be considered relevant for evaluating performance (Dechow et al., 1994), or limiting the incentives for managers to engage in CTA where there are potentially greater costs (both implementation and detection) is not determinable. A further consequence of the use of after tax performance measures in compensation contracts is that it may create an incentive for managers to adopt aggressive tax strategies, thereby increasing the performance outcome (Powers et al., 2016).

A major concern in this research is the difficulty that generally exists in distinguishing the various incentives for CTA. Of particular concern here are those relating to managers, and this doubtless contributed to the results in Phillips (2003) and the inability to find an association between the adoption of after tax performance measures and CTA. Researchers have endeavoured to address this by focusing on contexts where the alignment of shareholder and manager incentives for CTA is more likely. For example Desai and Dharmapala (2006) focus on contexts where there are high levels of incentive payments and Rego and Wilson (2012) focus on firms providing equity incentives. However, this approach does not distinguish the incentives for management to adopt aggressive tax strategies, and it provides only limited insights into how shareholder and manager incentives for CTA interact. Additionally, controlling for shareholder incentives that may impact the use of before or after-tax performance measures is problematic and there are potential issues with endogeneity. These are identifiable in Gaertner (2014) and while there is evidence of a positive association between after tax performance measures and CTA, whether there is sufficient control for the establishment of after tax (as opposed to before tax) performance measures is a concern.

Powers et al. (2016) endeavour to address the challenge this presents by distinguishing CTA for firms with different combinations of cash flow and earnings-based performance measures and cash and accrual-based measures of CTA. Underpinning this analysis is the evaluation of the impacts of different tax strategies on performance measures which is presented in Exhibit 1 of that paper (Powers et al., 2016). Problematically, this reduces consideration of the impacts of the strategies employed on the measures of tax avoidance to a single period. This ignores the impact of tax accruals reversing (and summing to zero over time) in subsequent periods and this is highlighted in Table 2.1. This is a simple example that demonstrates the behaviour of temporary differences over time. This is undertaken by considering the impact of different depreciation rates for accounting and tax purposes for a single asset which generates temporary differences that reverse over the life of the asset. Critically, this demonstrates that any benefits from temporary differences are entirely transitory. A further complication is that if the strategy is undertaken in successive years the impacts in one year are offset by the reversals of strategies from prior years. Hence, temporary differences cannot form part of an effective tax strategy with cash flow-based performance targets, unless it is the final year of employment (a horizon problem). Problematically, this was ignored in the analysis of corporate tax strategies by Powers et al. (2016). Further highlighted by Table 2.1 is that with temporary differences the average Cash Effective Tax Rate (CETR) and the average Effective Tax Rate (ETR) will be the same over the life of the asset. This makes comparison of differences in CETR and ETR measures over multiple periods problematic. However, temporary differences can still influence reported earnings in individual years, even though they reverse over time. Because executive incentive contracts often include earnings thresholds for bonus eligibility, managers may have an incentive to accelerate or defer taxable income to optimise compensation outcomes within specific periods. Hence, whether the research design captures the impact of after-tax performance measures on CTA is uncertain.

Table 2.1

Tax accruals across multiple periods

Consideration of the impacts of recognition of expenses in different periods for accounting and tax purposes. An asset is purchased for $10,000 in period 1 and depreciated over 5 (3) years for accounting (tax) purposes. This gives rise to differences in depreciation for accounting and tax purposes. For accounting it is $2000 per year for 5 years. For tax it is $3,333 for three years. This results in temporary differences increasing by $1,333 per year for 3 years and these reverse by $2,000 in years 4 and 5. With a tax rate of 30% this results in increases in deferred tax liabilities increasing by $400 for 3 years and reversing in years 4 and 5. Implications of this are

i. Temporary differences reverse exactly over time. This makes it difficult to consider temporary differences being part of an effective tax strategy over more than one period.
ii. For stable firms where this is repeated each period increases and decreases in temporary differences will offset and effective tax rate (ETR) and cash effective tax rate (CETR) measures will converge. This makes it difficult to consider temporary differences being part of an effective tax strategy generally.

Year	1	2	3	4	5	Total
Revenue	10,000	10,000	10,000	10,000	10,000	
Expenses	6,000	6,000	6,000	6,000	6,000	
Depreciation	2,000	2,000	2,000	2,000	2,000	
Income Before Tax	2,000	2,000	2,000	2,000	2,000	
- Tax Payable	200	200	200	1,200	1,200	3,000
- Defer Tax	400	400	400	-600	-600	0
Tax Expense	600	600	600	600	600	3,000
Income After Tax	1,400	1,400	1,400	1,400	1,400	
						Average
CETR	10%	10%	10%	60%	60%	30%
ETR	30%	30%	30%	30%	30%	30%

2.2.2 Shareholder incentives for corporate tax avoidance with dividend imputation

The most significant challenge identified in the literature above is distinguishing the incentives for management to adopt aggressive tax strategies from those of shareholders. A consequence of this is difficulty in attributing CTA to specific incentives. However, in Australia there is a system of dividend imputation that ameliorates the shareholder incentives for CTA for firms paying dividends with tax credits (McClure et al., 2018).

A primary motivation for the adoption of dividend imputation in Australia was to provide relief from the double taxation of profits that typically occurs with a 'classical' tax system. For firms paying dividends with tax credits the costs of corporate tax payments to shareholders are ameliorated by dividend imputation, with the result that there is little benefit for shareholders from CTA. This is not necessarily limited by the magnitude of dividend payments or target dividend payout ratios as higher dividend payout ratios may be accompanied by dividend reinvestment plans. This allows for the full distribution of imputation credits and dividend reinvestment plans might be considered a low-cost alternative to CTA. This strategy effectively 'strips' tax credits while maintaining a target (net) dividend payout ratio. For example, in 2017 Woolworths Ltd had a relatively high dividend payout ratio (70.7%) which is consistent with its cash effective tax rate, but the effective payout was reduced to 44.5% after dividend reinvestment was taken into account. Accordingly, for firms paying dividends with tax credits this suggests little variation in the shareholder incentives for CTA (i.e., none), and the impacts are extreme (i.e., dichotomous not continuous). However, there is still considerable variation in tax avoidance across firms and the incentives for management to adopt aggressive tax strategies may contribute to this.

In the absence of shareholder incentives for CTA for firms paying dividends with tax credits a major determinant of the incentives for the adoption of aggressive tax strategies will be management compensation contracts, and in particular whether the performance measures adopted are before or after tax. As Bebchuk and Fried (2003) note, while compensation contracts may alleviate agency problems, their design may also contribute to agency problems.

This identifies critical aspects of this context. First, with dividend imputation there are circumstances where there are no shareholder incentives for CTA. Second, the shareholder incentives for CTA in these circumstances are unambiguously observable, and do not require estimation with models or the use of proxies. Third, manager incentives for CTA can be

observed through the performance targets in management compensation contracts. This allows evaluation of the extent to which management incentives impacts CTA. Consideration of other aspects of management compensation contracts is beyond the scope of this chapter. Notwithstanding the specific context, the results might be considered generalisable, as there is little to distinguish the use of management compensation contracts and CTA in Australia, other than those noted above.

To evaluate whether after tax performance measures in management compensation contracts create incentives for CTA, for which there is little benefits for shareholders (i.e., rent extraction), the following hypothesis is tested:

H_1: *Firms paying dividends with tax credits adopting after tax performance measures have more aggressive tax strategies than those with before tax performance measures.*

2.3 Research design

Evaluation of the impact of compensation contracts on CTA is undertaken with multivariate analysis which considers differences in measures of CTA across firms adopting before or after-tax performance measures. This is undertaken with the following model:

$$TaxAvoid_{it} = \beta_0 + \beta_1 AfterTax_{it} + \sum_{n=2}^{j} \beta_n Controls_{it} + \varepsilon_{it} \quad (1)$$

The variables used are defined as follows.

Corporate Tax Avoidance (TaxAvoid)

Evaluation of CTA is problematic as it can't be directly observed. Accordingly, it requires the use of a proxy that is relevant to the research question (Hanlon & Heitzman, 2010).

In this chapter it is measured with an Effective Tax Rate (*ETR*) as accounting earnings are referenced in management compensation contracts and there is no evidence of modification of the tax expense. It is calculated as tax expense divided by pre-tax income and calculated annually as this is the period typically referenced in compensation contracts. However, it should be acknowledged that ETRs can be affected by earnings management practices involving tax accruals, which may influence the reported tax expense (Dhaliwal et al., 2004). This potential limitation should be considered when interpreting the results.

Compensation Contract Incentive (AfterTax)

The incentives for CTA are captured by the variable *AfterTax* which is a dichotomous variable which adopts the value one if accounting-based performance measures in compensation contracts reference after tax earnings (as opposed to before tax earnings) and zero otherwise.

Controls

It is difficult to determine the extent to which controls are necessary. These often focus on incentives (i.e., costs and benefits) for CTA beyond those addressed in the hypotheses. However, with dividend imputation there are limited shareholder incentives for CTA for firms paying dividends with tax credits. Hence, controls for this purpose will likely be unnecessary and insignificant in this context where firms are not expected to be adopting aggressive tax strategies.

However, variation in measures of tax avoidance may also arise due to idiosyncrasies in the tax legislation which impact the determination of taxable income. Accordingly, attention is focused on a limited number of controls that are common in the literature and which likely capture these idiosyncrasies. This includes measures of general firm characteristics, such as

profitability (*ROA*) calculated as pre-tax income divided by total assets, firm size (*Size*) measured as the logged value of firm assets and firm leverage (*Lev*) calculated as the ratio of long-term debt to total assets. It also includes measures where there are differences in accounting and tax treatments, such as capital intensity (*CapInt)* measured as net property, plant and equipment divided by total assets and research and development activity (*R&D*) measured as research and development expense divided by total assets. A governance variable is included (*IndDir)* which is calculated as the number of independent directors divided by the total number of directors.

Table 2.2

Definition of variables used in this chapter

Panel A: Dependent variables and proxy for corporate tax avoidance		
$BeforeTax_{it}$	:	A dichotomous variable assuming the value 1 where there is a before tax performance measure for firm i in year t, otherwise 0.
$AfterTax_{it}$	:	A dichotomous variable assuming the value 1 where there is an after-tax performance measure for firm i in year t, otherwise 0.
ETR_{it}	:	A continuous variable calculated as tax expense divided by pre-tax income for firm i in year t.

Panel B: Control Variables		
$IndDir_{it}$	:	A continuous variable calculated as the number of independent directors on the board, divided by the total number of directors for firm i in year t
ROA_{it}	:	A continuous variable calculated as pre-tax income divided by total assets for firm i in year t.
$Size_{it}$	:	A continuous variable calculated as the log of total assets for firm i in year t.
Lev_{it}	:	A continuous variable calculated as the ratio of long-term debt to total assets for firm i in year t.
$CapInt_{it}$	:	A continuous measure of the level of capital intensity and is defined as net property, plant and equipment divided by total assets for firm i in year t.
$R\&D_{it}$	:	A continuous variable calculated as research and development expense divided by total assets for firm i in year t.

Source: Morningstar DatAnalysis, Connect 4 BoardRoom, and company remuneration reports.

Finally, recognising the potential for variations in measures of tax avoidance to reflect industry factors, controls for industry are included. However, caution is required as variations in the incidence of after-tax performance measures across industries, possibly as a consequence of compensation consultants, create a risk of collinearity which would weaken tests. To mitigate this risk, regressions are estimated and industry controls only included where there is a significant association with the measure of tax avoidance. More detailed explanation of variables used in this paper is presented in Table 2.2.

2.4 Sample and data description

2.4.1 Sample identification

Sample firms are in the first instance identified from firms listed on the Australian Securities Exchange that paid dividends with imputation credits over the period 2004 to 2019. This period is selected as it is subsequent to changes to the imputation system that extended the benefits of imputation to a greater proportion of shareholders by allowing the refund of tax credits. This provides greater certainty that any benefits to shareholders from CTA are eliminated by the payment of dividends with imputation credits. Extending the sample period to more recent periods is precluded by disruptions consequent to COVID 19 that impacted firm profitability and dividend payments (Janus Henderson Investors, 2021; APRA, 2020; Ali, 2022). Financial report information was obtained from the Morningstar DatAnalysis database, and governance data was sourced from the Connect 4 BoardRoom database, which provides detailed information on directors and senior executives of companies listed on the Australian Securities Exchange.

Details of performance targets in management compensation contracts were hand collected from the Remuneration Report in financial reports. Accounting measures of financial

performance[3] were most commonly used in relation to short term compensation and hence attention was focused on these performance targets. The targets used by firms were identified as before tax, after tax, both, or not identified / relevant. Consideration was limited to those firms where only before tax or after-tax performance targets were used.

The process of estimating ETRs identified a number of firm years with extreme values of the incidence of taxation, being either minimal / no tax expense in individual years or tax expenses significantly above the statutory rate (30%) in Australia over the period. This occurred notwithstanding sample firms being relatively homogeneous and all paying dividends with imputation credits. While it is common to limit the measures to the range zero to 100%, more careful evaluation of extreme observations is considered necessary. Such extreme measures, significantly above the statutory rate are most likely a consequence of error in measuring CTA and it is difficult to justify inclusion of such values when evaluating CTA. Furthermore, it places extreme reliance upon controls for measures which are most likely a consequence of idiosyncrasies in the tax system. Accordingly, a more restricted range for measures of ETR is suggested.

A common reason for firms paying no or minimal tax in a particular period are tax losses that may be carried forward. While this is particularly problematic for cash-based measures (i.e., CETR), it is generally considered less problematic for *ETRs.* However, this is conditional on the recognition of deferred tax assets and this is not assured as AASB 112 *Income Taxes* attaches conditions to recognition. In many instances they are not met. Addressing this would suggest that minimum tax rates of zero or less be excluded. However, whether this is sufficient is doubtful as the circumstances where tax losses are carried forward (i.e., zero tax expense) will be obscured if there are taxes paid in other jurisdictions. These taxes in other jurisdictions

[3] This would include both GAAP earnings measures and Non-GAAP measures of performance. The focus of this chapter is only on one aspect of management compensation contracts, rather than broader issues associated with contract design. Hence the only distinction was whether the measures were before or after tax.

are often minimal[4] and as a consequence extreme ETRs are estimated that would not be reflective of tax avoidance. This would suggest a marginally higher threshold and limiting sample firm years to those with effective ETRs above a minimum of 3% (i.e., 10% of the statutory tax rate).[5] Furthermore, such low incidences of taxation if accurate would attract extreme scrutiny from taxing authorities and are hence unrealistic.

There are also examples of firms with effective tax rates significantly above the statutory tax rate of 30%. A major contributor to these measures is non-deductible expenses (e.g., amortisation and impairment of goodwill) and these might be considered idiosyncrasies in the tax legislation. Clearly, this does not represent CTA and it is problematic that effective tax rates above the statutory rate are potentially deterministic in the evaluation of CTA. To limit the impact of these problems sample firms are limited to those with ETRs below 33% (i.e., the statutory rate plus 10%).[6] This resulted in a sample of 912 firm years.[7]

Restricting the sample in this manner might seem arbitrary.[8] To address these concerns alternative filters are considered. First consideration is given to ETRs greater than zero and less than 39%, the former being the typical lower bound and the latter being 30% above the statutory tax rate. Second consideration is given to ETRs within three standard deviations of the mean. While these filters diverge from those commonly used in the literature, this is considered

[4] Tax credits that can be distributed only arise from taxes paid in Australia. Accordingly, there are incentives to minimise taxes paid in other jurisdictions. This commonly occurs through strategies labelled Base Erosion and Profit Shifting. The practical consequence of this is the sample firms predominantly make tax payments in Australia.

[5] This adjustment is especially salient to the context for this study where imputation credits are only created by tax payments in Australia. Determination of whether this is relevant in other contexts is beyond the scope of this chapter.

[6] Following the procedures described in Schwab et al. (2022) and the method set out by Tahir's (2023) working paper, I examined and identified the relevant range of observations for ETRs that allows values for a realistic evaluation of tax avoidance. The range of measures of tax avoidance was limited to those companies with tax rates in the 3% to 33% range. The reasons for choice of this range are detailed in Appendix A.

[7] A detailed sample derivation table is provided in the Appendix A.7, Panel A. The table begins with all firm-year observations available in DatAnalysis from 2004–2019 and shows the effect of each successive sample restriction. Both the number of firm-years and the number of unique firms are reported at each stage to illustrate how the final sample of 912 firm-years was derived. The distribution of the final sample across years and industry sectors is presented in Appendix A.7, Panels B and C, respectively, to demonstrate temporal coverage and sectoral representation.

[8] It is no less arbitrary than the limits of 0% and 100% commonly applied.

necessary as the excluded observations are likely impacted by measurement error and not capturing tax avoidance. Furthermore, it will provide insights into the sensitivity of results to measures of effective tax rates that are potentially unsound.

2.4.2 Sample description

Descriptive statistics for sample firms are presented in Table 2.3. A sample of 912 firm years are identified, and of these 60.4% have before tax performance measures in management compensation contracts. Importantly this shows there is considerable diversity in performance measures across compensation contracts. The mean (median) *ETR* is 0.222 (0.237) and this is notable for two reasons. First, the magnitude of this variable relative to a statutory tax rate of 30% suggests that there is little evidence of systemic CTA in sample firms. This is consistent with expectation given the sample selection criteria and confirms that the shareholder incentives for CTA are largely eliminated. It is also consistent with the results in McClure et al. (2018). Second, a further consequence of sample selection and firms paying dividends with tax credits is that earnings for these firms are highly persistent (Coulton et al., 2014) and this leads to the convergence of *ETR* with another measure of CTA (i.e., Cash Effective Tax Rate - *CETR*).[9] This was undertaken as a robustness test for the measure of CTA adopted and provides increased confidence in the ETR measure of CTA within this sample of firms.

The mean (median) of *IndDir* is 0.709 (0.750) and the 25th percentile value is 0.600. The majority of firms have independent chairs and the limited variation in this variable precludes further consideration as a governance variable. These are both consistent with effective corporate governance in most sample firms and reflect compliance with the

[9] These results, unreported, arise as a consequence of problems related to the mismatch between cash payments – determined on the basis of prior-year profitability – and current-year profitability in CETR measures for firms with relatively stable earnings. It is for this reason that further consideration of CETR measures was not pursued.

requirements of the Principles for Good Corporate Governance and Best Practice issued by the Australian Securities Exchange.

Table 2.3

Descriptive statistics for continuous variables used in this chapter. For dichotomous variable only the mean is reported.

Panel A – Variables for sample of firms when tax avoidance calculated annually										
	Obs.	Mean	SD	Min	p5	p25	Median	p75	p95	Max
$BeforeTax_{it}$	912	0.604								
$AfterTax_{it}$	912	0.396								
ETR_{it}	912	0.222	0.078	0.030	0.067	0.172	0.237	0.318	0.286	0.330
$IndDir_{it}$	912	0.709	0.149	0.167	0.429	0.600	0.750	0.889	0.833	1.000
ROA_{it}	912	0.092	0.060	-0.027	0.024	0.051	0.076	0.212	0.118	0.382
$Size_{it}$	912	20.229	1.897	15.929	17.538	18.834	19.978	23.819	21.495	25.803
LEV_{it}	912	0.198	0.140	0.000	0.000	0.084	0.197	0.438	0.298	0.787
$CapInt_{it}$	912	0.129	0.143	0.000	0.006	0.026	0.074	0.437	0.184	0.711
$R\&D_{it}$	912	0.007	0.034	-0.286	0.000	0.000	0.000	0.039	0.000	0.298

All variables are defined in Table 2.2.

2.4.3 Performance measures: before or after tax

A critical feature of the research design is the nature of the performance measure and whether it is before or after tax. It is assumed that within this sample of firms that they will select before tax performance measures as this contributes to an alignment of management and shareholder incentives for CTA. However, it is notable that 39.6% of the sample adopt after tax performance measures. To provide insights into this choice which may have implications for research design the following model is estimated. This considers whether firms paying dividends with tax credits adopt before tax performance targets and whether this decision is impacted by corporate governance and other controls commonly associated with CTA:

$$BeforeTax_{it} = \alpha_0 + \sum_{j=1}^{n} \alpha_j \, Controls_{it} + \varepsilon_{it} \quad (2)$$

Where the variables other than those previously addressed are measured as follows.

$BeforeTax_{it}$: A dichotomous variable assuming the value 1 where there is a before tax performance measure in the management compensation contract for firm i in year t, otherwise 0.

Other variables are as previously defined (see Table 2.2).

The results of estimating this model are presented in Table 2.4. As the sample is entirely comprised of firm years where there are no shareholder incentives for CTA, the extent to which these dictates before tax performance targets is identified by the constant. This is positive and significant (α_0=1.195, t-stat=5.618).[10] Hence after the inclusion of controls or other factors that might influence the choice of performance targets there is still strong support for firms choosing before tax performance targets. There is no evidence that firms with relatively more independent directors on the board are associated with choice of before tax performance measures that align shareholder and manager incentives for tax avoidance (α_1=0.099, t-stat=0.873). This result is probably not surprising as majority board independence is common since the Australian Securities Exchange first issued its Principles for Good Corporate Governance and Best Practice recommendations in 2003.

Of the other controls, there is some evidence that firm profitability as measured by *ROA* is negatively associated with the adoption of before tax performance measures (α_2=-0.461, t-stat=-1.678). There is also evidence of larger firms being less likely to adopt before tax performance measures (α_3=-0.023, t-stat=-2.157). However, it is also notable that the model has only modest explanatory power (11%). While statistically significant this does suggest that the choice of before or after-tax performance measures is not persistently impacted by variables typically associated with CTA. This limits the potential impact of selection biases and the ability to develop a two-stage research design.

[10] To the extent that this is captured by the constant this will not reflect in the explanatory power of the model.

Table 2.4

Determinates of performance measures in management compensation contracts

For firms paying dividends with tax credits (sample firms) there are few shareholder incentives for CTA, and this suggests the adoption of before tax performance targets in compensation contracts. This applies to all sample firms, and this is captured by the constant. However, a concern is whether this is impacted by corporate governance and other controls commonly associated with CTA. Industry controls included for industries where there is a significant association with ETR, and robust standard errors calculated.[11]

	1 year		
	Co-efficient	t-stat	
Constant	1.195	5.618	***
$IndDir_{it}$	0.099	0.873	
ROA_{it}	-0.461	-1.678	*
$Size_{it}$	-0.023	-2.157	***
LEV_{it}	-0.095	-0.723	
$CapInt_{it}$	-0.322	-2.847	***
$R\&D_{it}$	1.032	2.567	**
Observations	912		
Psuedo R^2	0.114		
Ind effects	Yes		

Asterisks ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

All variables are defined in Table 2.2. This table reports coefficients of the following model:

$$BeforeTax_{it} = \alpha_0 + \sum_{j=1}^{n} \alpha_j \, Controls_{it} + \varepsilon_{it} \quad (2)$$

The negative association between firm performance and the adoption of after-tax performance measures likely provides insights into the decision to adopt after tax performance targets. For management of firms with poorer performance there is scope for increasing compensation payments by adopting aggressive tax strategies, but an after-tax performance target is critical to realising this benefit. This suggests a joint decision, for there is little incentive for CTA if a before tax performance target is adopted. Critically, there is little incentive for shareholders to initiate after-tax performance measures as it provides no shareholder benefits. This applies even for firms with relatively high effective tax rates as the

[11] To account for heteroskedasticity in the error terms, all regressions are estimated using White heteroskedasticity-robust standard errors. This adjustment corrects for potential heteroskedasticity in the residuals, ensuring that statistical inference is not biased by non-constant error variance.

cost of taxation can be ameliorated by combining a high dividend payout ratio with a dividend reinvestment plan. This is demonstrated by Woolworths Ltd which in 2017 had a nominal dividend payout ratio of 70.7%, that was reduced to an effective dividend payout ratio of 44.5% (net of dividend reinvestment). This ensures that the full benefit of corporate tax payments is passed on to shareholders and any benefit to shareholders of CTA is eliminated. The absence of alternative theories and incentives for the adoption of after-tax performance targets limits the scope for developing a model to determine expected performance target (other than before tax) and adopting a two staged research design.

2.5 Results

2.5.1 Corporate tax avoidance and performance targets in compensation contracts (H_1)

Of primary concern in this chapter is the association between CTA and the performance targets in management compensation contracts. Consistent with substantial prior literature, CTA is evaluated using measures of the incidence of taxation. Hence, a lower value is assumed to be the result of CTA.

Emphasis is first given to univariate tests of differences in tax avoidance for firms with before and after-tax performance measures in management compensation contracts. When tax avoidance is measured as *ETR,* the mean for firms with before tax (after tax) performance measures is 22.8% (21.3%). The difference is statistically significant (t-stat=2.899, p=0.004).[12] This result provides initial support for H_1 in that firms that utilise after-tax performance measures being more tax aggressive.

The focus then shifts to multivariate tests, with the results presented in Table 2.5. It is notable that the constant in the regression is positive and significant (β_0=0.167, t-stat=5.024).

[12] Additional tests were performed, and the difference was found to be statistically significant. Detailed results are provided in Appendix A.8.

This might be considered high and suggests limited tax avoidance for this sample, but it is consistent with the results in McClure et al. (2018) and confirms dividend imputation as largely eliminating the incentives for CTA for sample firms.[13] Importantly the co-efficient on *AfterTax* is negative and significant (β_1=-0.011, t-stat=-1.909) and this is consistent with firms having an after-tax performance measure adopting more aggressive tax strategies. This result provides evidence of performance targets in management compensation contracts providing an incentive for CTA (H_1).

Table 2.5

The impact of management compensation contracts on corporate tax avoidance – Effective tax rates (3%-33%)

Evaluation of the impact of performance targets in management compensation contracts on CTA, measured by ETR (H_1). ETR is calculated annually. Sample firms are limited to those with ETR in the range 3% to 33%. Industry controls included for industries where there is a significant association with ETR, and robust standard errors calculated.

	1 year		
	Co-efficient	t-stat	
Constant	0.167	5.024	***
$AfterTax_{it}$	-0.011	-1.909	*
$IndDir_{it}$	-0.024	-1.354	
ROA_{it}	0.157	3.371	***
$SIZE_{it}$	0.002	1.317	
LEV_{it}	0.056	2.688	***
$CapInt_{it}$	-0.002	-0.126	
$R\&D_{it}$	0.134	2.675	***
Observations	912		
R^2	0.091		
Ind effects	Yes		

Asterisks ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

All variables are defined in Table 2.2. This table reports coefficients of the following model:

$$TaxAvoid_{it} = \beta_0 + \beta_1 AfterTax_{it} + \sum_{n=2}^{j} \beta_n Controls_{it} + \varepsilon_{it} \quad (1)$$

[13] This validates the decision to focus on these firms, however, a consequence of this is that the explanatory power of the model will be biased downward by the relatively high incidence of taxation generally.

In relation to the controls, the co-efficient on *ROA* is positive and significant (β_4=0.157, t-stat=3.371) and this is consistent with more profitable firms having a greater incidence of tax. However, the co-efficient on *Size* while positive is not significant (β_5=0.002, t-stat=1.317). Often size is used to capture increased costs arising from CTA (e.g., increased scrutiny) but given the relatively high incidence of taxation in this sample that may not be an issue here. The coefficients on *IndDir* is negative but insignificant (β_2=-0.024, t-stat=-1.354). This may be a consequence of limited variation in governance characteristics as firms generally endeavour to comply with the Principles for Good Corporate Governance and Best Practice issued by the Australian Securities Exchange (Matolcsy et al., 2011).

In the above analysis firm profitability (i.e., *ROA*) is identified as significant variable in explaining effective tax rates. This result is not surprising. However, it identifies the potential issue of whether the use of after-tax performance measures creates incentives for CTA generally, or more specifically for high performing firms where there are potentially greater benefits. There is also the possibility of poorly performing firms recognising impairments and non-deductible expenses which would impact measures of CTA. To address this issue, equation (1) was re-estimated with the addition of an interaction variable (*AfterTax*ROA*). The results are presented in Table 2.6.

These results provide several interesting insights. The co-efficient on *AfterTax* is positive (not negative) and significant (β_1=0.021, t-stat=2.305). This result may seem incongruous, but it may be a consequence of relatively poorly performing firms being more likely to recognise non-deductible expenditure (i.e., asset impairment) that causes measurement error in proxies for tax avoidance. The co-efficient on *ROA* is positive and significant (β_4=0.304, t-stat=5.686). This confirms that increases in firm profitability are generally associated with a higher incidence of tax. However, the coefficient on the interaction of *ROA* and *AfterTax* is negative and significant (β_5=-0.359, t-stat=-4.359). Critically, there is

a significantly different association between firm performance and tax avoidance when after tax performance measures are used. Hence, the finding above of after-tax performance measures being associated with CTA is more likely attributable to the more profitable firms.

Table 2.6

The impact of management compensation contracts on corporate tax avoidance – Effective tax rates (additional analysis)

Evaluation of the impact of performance targets in management compensation contracts on CTA, measured by ETR (H_1). As additional analysis, consideration is given to whether this result is sensitive to firm profitability. ETR is calculated annually. Sample firms are limited to those with ETR in the range 3% to 33%. Industry controls included for industries where there is a significant association with ETR, and robust standard errors calculated.

	1 year		
	Co-efficient	t-stat	
Constant	0.158	4.778	***
$AfterTax_{it}$	0.021	2.305	**
$AfterTax_{it} * ROA_{it}$	-0.359	-4.359	***
$IndDir_{it}$	-0.029	-1.617	
ROA_{it}	0.304	5.686	***
$SIZE_{it}$	0.002	1.237	
LEV_{it}	0.064	3.029	**
$CapInt_{it}$	-0.004	-0.241	
$R\&D_{it}$	0.094	1.828	
Observations	912		
R^2	0.108		
Ind effects	Yes		

Asterisks ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

All variables are defined in Table 2.2. This table reports coefficients of the following model:

$$TaxAvoid_{it} = \beta_0 + \beta_1 AfterTax_{it} + \beta_2 AfterTax_{it} * ROA_{it} + \sum_{n=3}^{j} \beta_n Controls_{it} + \varepsilon_{it}$$

2.5.2 Additional analysis

The impact of limiting the range of measures of CTA to 3% to 33% may potentially influence the results reported above. To address this concern the analysis undertaken was

repeated with the measures of CTA limited to the range 0% (a traditional cut-off) and 39% (30% above the statutory rate), as well as winsorized at three standard deviations.

The results are presented in Table 2.7 when the sample is limited to firms with effective tax rates between 0% and 39%. There is a material increase in sample size from 912 to 1,170 when the sample criteria are relaxed, with this indicating a significant incidence of firms outside the initial criteria for sample selection. The results are weaker, and in particular the co-efficient on *AfterTax* is still negative but insignificant (β_1=-0.008, t-stat=-1.288). This suggests that the results are sensitive to this expansion of the sample.

Table 2.7

The impact of management compensation contracts on corporate tax avoidance – Effective tax rates (0%-39%)

Evaluation of the impact of performance targets in management compensation contracts on CTA, measured by ETR (H_1). ETR is calculated annually. Sample firms are limited to those with ETR in the range 0% to 39%. Industry controls included for industries where there is a significant association with ETR and robust standard errors calculated.

	1 year		
	Co-efficient	t-stat	
Constant	0.158	3.957	***
$AfterTax_{it}$	-0.008	-1.288	
$IndDir_{it}$	-0.043	-1.892	*
ROA_{it}	0.120	1.642	
$SIZE_{it}$	0.004	1.739	*
LEV_{it}	0.031	0.899	
$CapInt_{it}$	0.011	0.499	
$R\&D_{it}$	0.124	1.536	
Observations	1170		
R^2	0.071		
Ind effects	Yes		

Asterisks ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

All variables are defined in Table 2.2. This table reports coefficients of the following model:

$$TaxAvoid_{it} = \beta_0 + \beta_1 AfterTax_{it} + \sum_{n=2}^{j} \beta_n Controls_{it} + \varepsilon_{it} \quad (1)$$

The results are presented in Table 2.8 when the sample is limited to firms with effective tax rates within three standard deviations of the mean. There is a further increase in sample size from 1,170 to 1,254 when the sample criteria are relaxed. The results are further weakened and the co-efficient on *AfterTax* while still negative is insignificant (β_1=-0.005, t-stat=-0.668).

Table 2.8

The impact of management compensation contracts on corporate tax avoidance – Effective tax rates (+/- 3s.d.)

Evaluation of the impact of performance targets in management compensation contracts on CTA, measured by ETR (H_1). ETR is calculated annually. Sample firms are limited to those with ETR in the range +/- 3 standard deviations. Industry controls included for industries where there is a significant association with ETR, and robust standard errors calculated.

	1 year		
	Co-efficient	t-stat	
Constant	0.244	5.729	***
$AfterTax_{it}$	-0.005	-0.668	
$IndDir_{it}$	-0.058	-2.382	**
ROA_{it}	0.028	0.401	
$SIZE_{it}$	0.001	0.433	
LEV_{it}	0.033	0.942	
$CapInt_{it}$	0.020	0.798	
$R\&D_{it}$	0.123	1.545	
Observations	1254		
R^2	0.054		
Ind effects	Yes		

Asterisks ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

All variables are defined in Table 2.2. This table reports coefficients of the following model:

$$TaxAvoid_{it} = \beta_0 + \beta_1 AfterTax_{it} + \sum_{n=2}^{j} \beta_n \, Controls_{it} + \varepsilon_{it} \quad (1)$$

This additional analysis identifies a significant challenge in research considering CTA. A range of measures of tax avoidance have been developed in the literature, and these generally result in extreme observations which are subject to limited screening. Of particular concern are measures materially above the statutory tax rate which are used to evaluate tax avoidance. Notwithstanding the sample firms being relatively homogeneous (i.e., firms paying dividends

with imputation credits) including these observations significantly impacted the results. Rather than this finding suggesting caution in interpreting the above results, it more likely suggests caution in including firms with extreme measures of CTA in samples. These impacts would likely be more pronounced in other contexts and evaluation of extreme observations is suggested for future investigation.

2.6 Conclusion

The objective of this chapter is to evaluate whether performance targets in management compensation contracts are associated with CTA. This is undertaken for a sample of Australian firms paying dividends with tax credits, and for which the shareholder incentives for CTA are largely eliminated. In this context after-tax performance targets create incentives for managers to adopt aggressive tax strategies that are of no benefit for shareholders.

There is limited evidence of CTA generally for this sample of firm years and this is consistent with the lack of shareholder incentives for CTA. Furthermore, the incidence of taxation is consistent with that reported in McClure et al. (2018). Most firms (60.4%) in the sample adopt before tax performance which aligns shareholder and manager incentives for CTA. Critically, this confirms the appropriateness of the sample for this study.

Notwithstanding the relatively high incidence of taxation generally there is variation, and evidence of CTA by firms utilising after-tax performance targets in management compensation contracts. For these firms there are no shareholder incentives for CTA, and to the extent that these strategies are costly, it would represent 'rent extraction' by managers. Additional analysis suggests that this result is most likely attributable to more profitable firms. However, caution is recommended as firms reporting poor performance are more likely to be recognising non-deductible expenditure (e.g., impairment of goodwill) that would cause error in the measure of CTA and bias against finding a result for these firms.

These results make a number of contributions to the literature. First, this chapter extends the literature by evaluating the extent to which performance targets in management compensation contracts provide incentives for CTA. This is undertaken in a context where there are no shareholder incentives for CTA. Hence there is no need to control for 'known and observable' determinants of the adoption of particular performance measures. Importantly, it identifies 'rent extraction' by managers through CTA.

Second, there is evidence of performance targets in management compensation contracts motivating CTA, and this is consistent with it being a strategy for improving reported performance or managing earnings. Accordingly, this extends the earnings management literature which has focused on accrual management (e.g., Healy, 1985; Holthausen et al., 1995) and real earnings management (e.g., Bartov, 1993) and identifies the potential for CTA to be used for earnings management.

Third, little evidence is found of effective corporate governance impacting the establishment of 'efficient' performance targets in management compensation contracts. A challenge in evaluating this is the overwhelming preponderance of independent boards and chairs for Australian firms since the Australian Securities Exchange issued its Principles of Good Corporate Governance and Practice recommendations.

Finally, insights into a measure of CTA (i.e., *ETR*) are provided. Extreme measures that are outside of that which might be considered economically feasible may result from idiosyncrasies in the tax system. To the extent that these are not adequately controlled for, CTA will be misidentified, and this will potentially impact the results.

Appendix A – Sample Selection

An issue with an evaluation of tax avoidance of firms is that it cannot be directly observed and measured externally from financial statements. Hence, the literature has developed proxies for tax avoidance, often focusing on calculating an effective tax rate (ETR) and cash effective tax rate (CETR). Both proxies are measured and utilized in my study.

Initially, I hand collected my sample data from the Morningstar DatAnalysis database and then following Schwab et al. (2022) and the method set out by Tahir's (2023) working paper, I examined and attempted to identify the relevant range of observations for each of the aforementioned proxies that allows values for a realistic evaluation of tax avoidance.

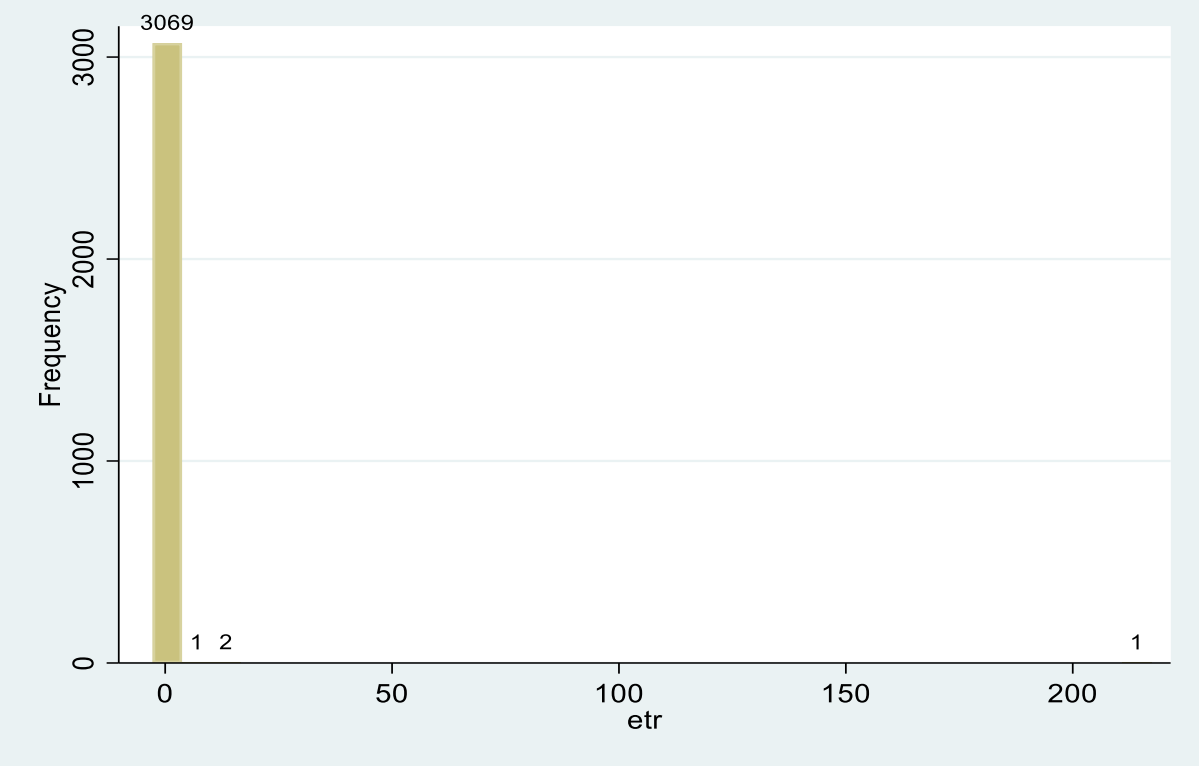
2A.1 Sample Selection for ETR

The academic literature on tax avoidance commonly limits the range of values for the sample from 0 to 1 because the observations below 0 and above 1 are difficult to interpret in this context (Stickney & McGee, 1982; Gupta & Newberry, 1997; Wang, 1991; Wilkie & Limberg, 1993).

Critically, as my study requires an evaluation of the level of, or potential for tax avoidance, values above the statutory tax rate in this setting (i.e., 30%) are less likely to represent tax avoidance and more likely to be caused by artifacts such as reversals of accruals or differences between accounting and taxation rules. Hence, it is logical to restrict the sample closer to the statutory tax rate, rather than follow the current tax avoidance literature, which generally employs ETR values as high as 1 (i.e., 100%). The distribution of ETR values for the full sample, as illustrated by the histogram (Figure A2.1), demonstrates a wide range of values, with some exceeding 100%. Hence, values exceeding the 0 - 1 limits are excluded from the sample.

Figure A2.1

Histogram. Full sample (N = 3,073), where pre-tax income (PI) >= 0.



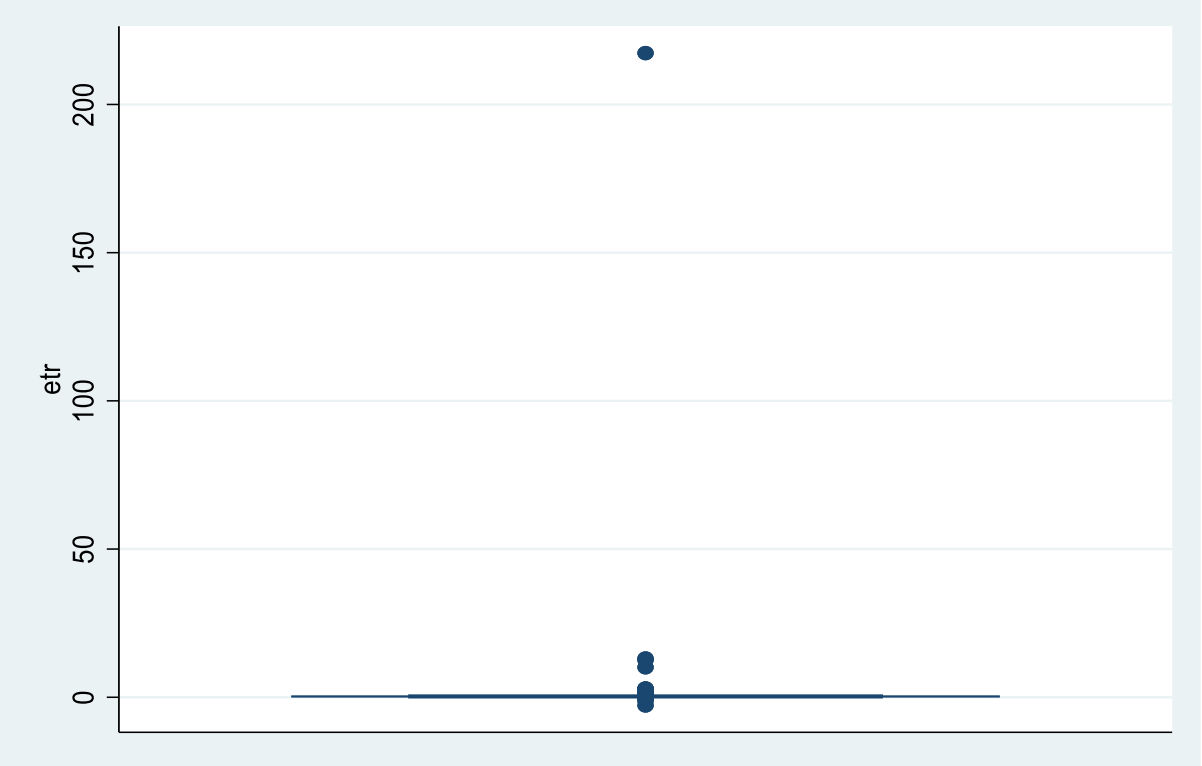
Appendix A.1 Descriptive statistics for ETR.

variable	N	mean	sd	min	p1	p5	p10	p50	p90	p95	p99	max
ETR	3073	0.352	3.939	-2.761	0.000	0.002	0.043	0.262	0.436	0.556	1.191	217.333

An initial examination of the descriptive statistics (Appendix A.1) demonstrates that there are a small number of extreme observations that are so high above the statutory tax rate of 30% that it is unlikely that they exhibit tax avoidance, rendering them too weak for use in this study. The subsequent boxplot (Figure A2.2) further highlights this issue.

Figure A2.2

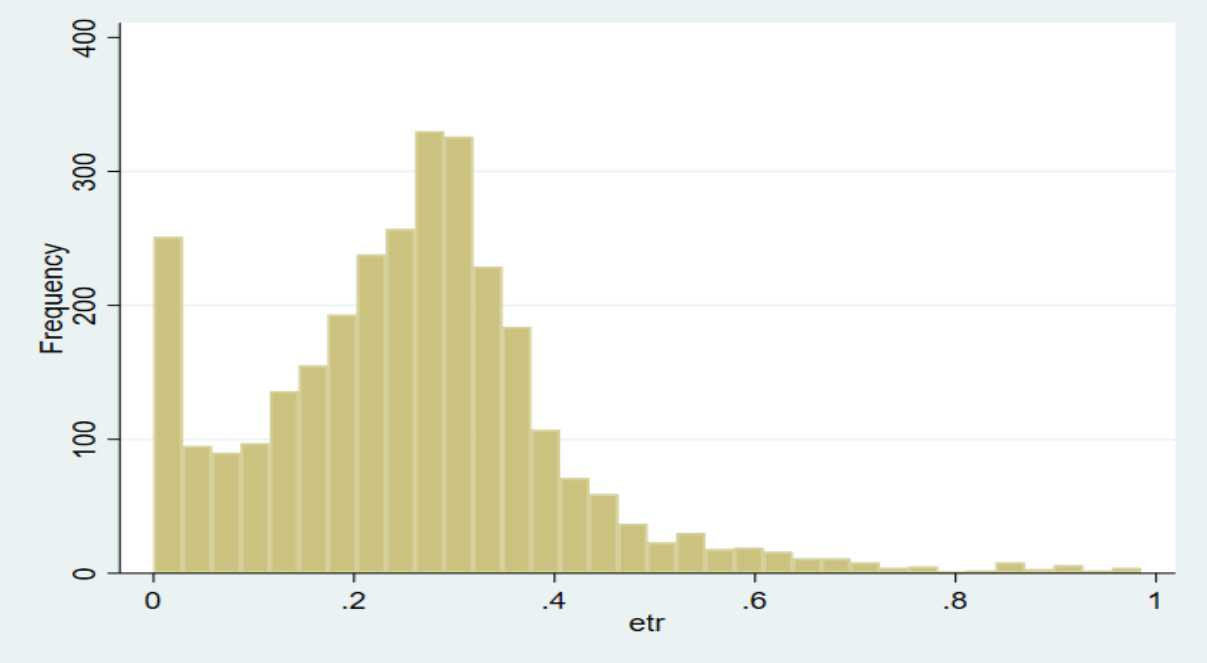
Boxplot. Full sample (N = 3,073).



Next, I follow the procedures described in Schwab et al. (2022) and Tahir's (2023) working paper where it is suggested that some of the remaining values that appear at an extreme distance above the statutory tax rate of 30 per cent in the Australian setting remain problematic, requiring additional sample restrictions. Upon examining the distribution of ETR values between 0 and 1, the histogram in Figure A2.3 demonstrates that, even after the aforementioned exclusions, a long right-hand tail remains. Specifically, the remaining sample appears to be skewed to the right.

Figure A2.3

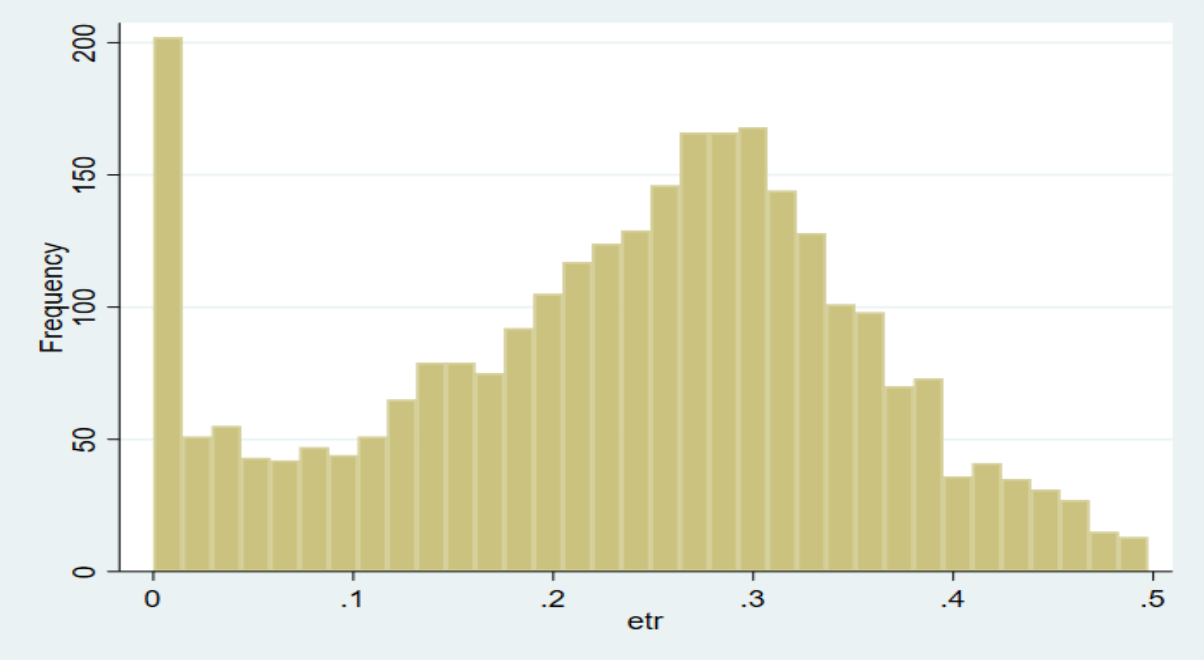
Histogram. Requirement: ETR >= 0 and ETR < =1 and PI >= 0. (N = 3,026).



Visual examination reveals a decline in frequency of ETRs above 0.5. I reviewed numerous financial statements of firms in the long tail (with values between 0.5 and 1) and found that these firms commonly report high ETR values due to asset impairments – such as the impairment of goodwill. I argue that these observations do not sufficiently act as a usable tax avoidance proxy, being the topic of interest in this investigation, and that is why I also exclude them from the sample. After removing these observations from the sample, the range of ETR values is between 0 and 0.5. The resulting sample is presented in Figure A2.4.

Figure A2.4

Histogram. Requirement: ETR >= 0 and ETR <= 0.5 and PI >= 0. (N = 2,858).



Finally, I refine the sample by evaluating the variables in terms of goodness-of-fit and the statistical significance of the coefficients (including the size coefficient) using a basic regression model. Following commonly applied statistics techniques (Leys et al., 2013) I run regression models by using different sampling techniques (such as mean plus or minus 3, 2 and 1 standard deviations, median absolute deviation (MAD) plus or minus 3, 2 and 1 MAD around median, and finally 10% incremental increase over the base statutory rate (i.e., 10% of 30% = 3% increments). Figures 2.5 and 2.6 illustrate the resulting distribution of ETR values using the thresholds of ETR +/- 3 standard deviations and ETR +/- 3 MAD, respectively. This process allows me to identify appropriate restrictions for ETR ranges.

Figure A2.5

Histogram. Requirement: mean ETR +/- 3 SD & PI >= 0. (N = 2,858).

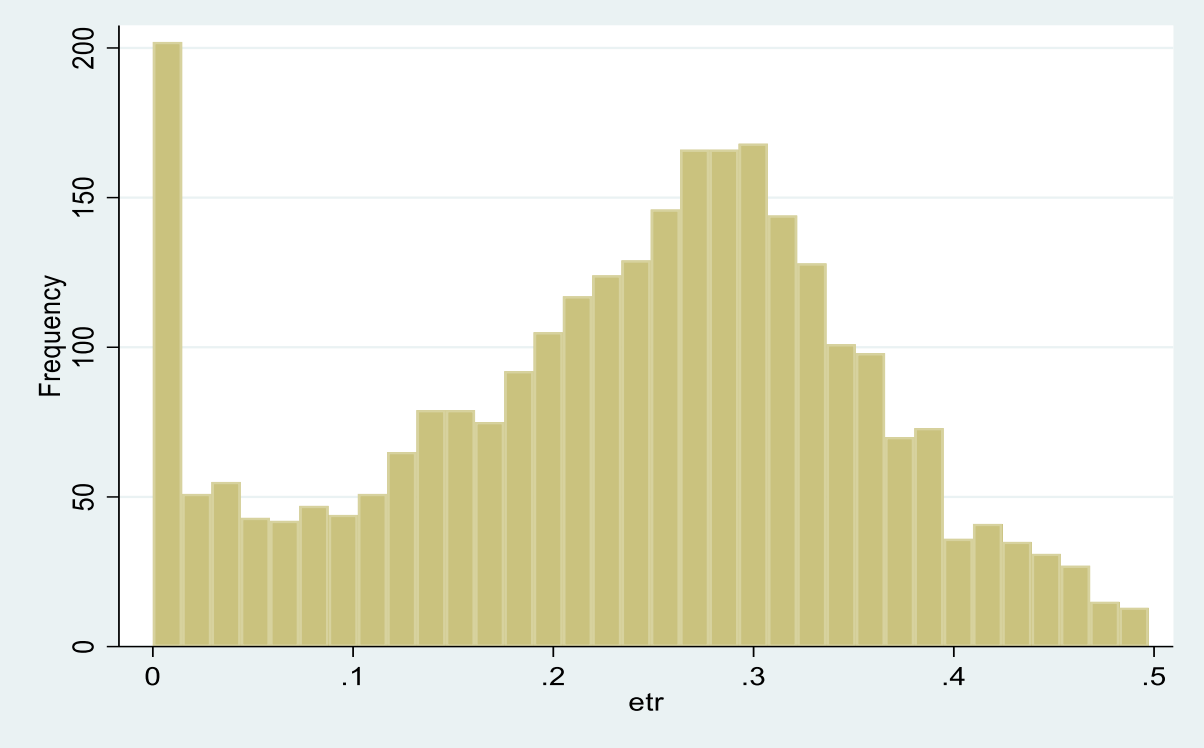
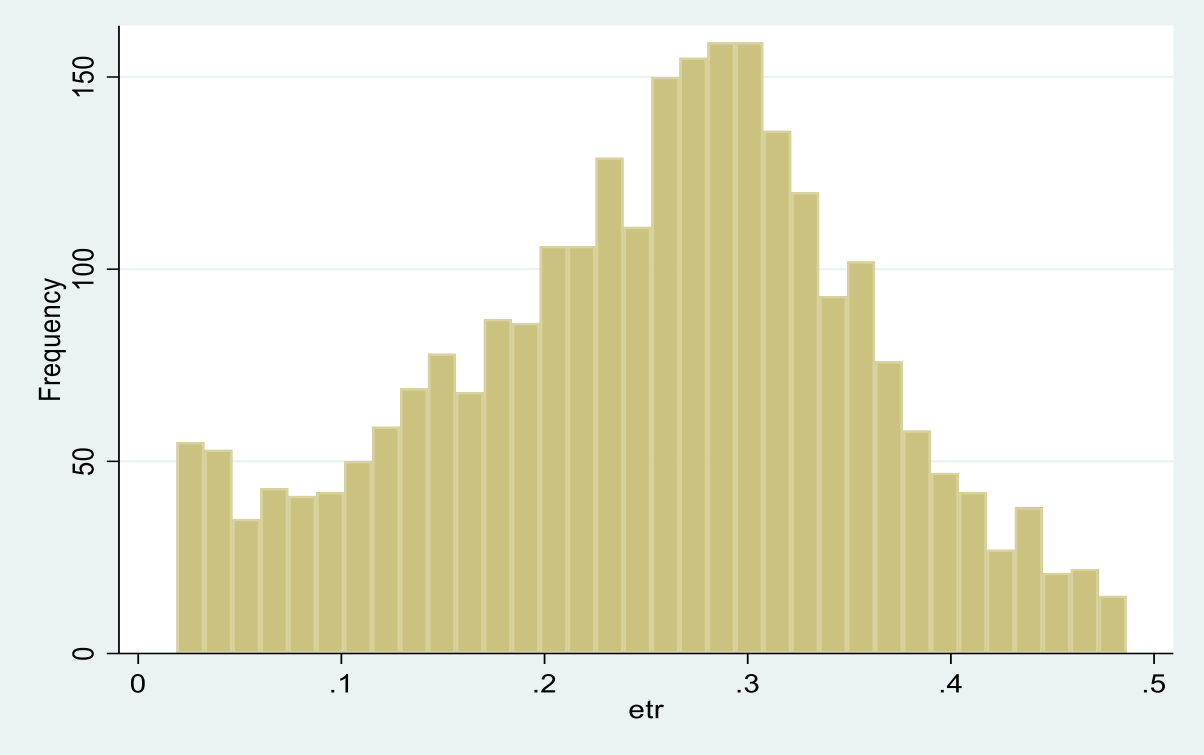


Figure A2.6

Histogram. Requirement: median ETR +/- 3 MAD & PI >= 0. (N = 2,638).



Further, examination of the results requires consideration of the adjusted R-squared, statistical significance and coefficients of independent variables for different models to determine which range of ETR values provides the best results. The results (Appendix A.2 and Appendix A.3) demonstrate that restricting the ETR range to between 0.00 and 0.33 provides a reliable model fit.

Appendix A.2. Results of regression analysis for ETR.

VARIABLES	0 <= etr <= 1 etr	0 <= etr <= 0.5 etr	0 <= etr <= 0.45 etr	etr +/- 3sd etr	etr +/- 2sd etr	etr +/- 1sd etr	etr +/- 3mad etr	etr +/- 2mad etr	etr +/- 1mad etr
AfterTax	-0.003	-0.006	-0.008	-0.006	-0.007	-0.005	-0.005	-0.001	-0.009**
	(-0.353)	(-0.981)	(-1.216)	(-0.981)	(-1.086)	(-1.271)	(-0.763)	(-0.294)	(-2.545)
IndDir	-0.041	-0.048**	-0.050**	-0.048**	-0.049**	0.002	-0.033	-0.008	-0.004
	(-1.426)	(-2.063)	(-2.173)	(-2.063)	(-2.120)	(-0.135)	(-1.501)	(-0.471)	(-0.343)
ROA	-0.200***	0.040	0.081	0.040	0.053	0.104***	0.073	0.084**	0.040
	(-2.973)	(-0.743)	(-1.528)	(-0.743)	(-0.993)	(-2.849)	(-1.366)	(-2.017)	(-1.388)
SIZE	-0.006**	0.000	0.001	0.000	0.000	-0.001	-0.002	-0.002	-0.001
	(-2.327)	(-0.179)	(-0.521)	(-0.179)	(-0.037)	(-0.374)	(-1.023)	(-1.171)	(-0.534)
LEV	0.007	0.036	0.034	0.036	0.033	0.044***	0.058**	0.045**	0.041***
	(-0.247)	(-1.632)	(-1.557)	(-1.632)	(-1.515)	(-2.659)	(-2.537)	(-2.480)	(-2.987)
CapInt	0.004	-0.008	-0.015	-0.008	-0.007	-0.040***	-0.021	-0.035**	-0.028**
	(-0.127)	(-0.354)	(-0.658)	(-0.354)	(-0.307)	(-2.689)	(-0.998)	(-2.098)	(-2.303)
R&D	0.101	0.107	0.109	0.107	0.109	-0.013	0.037	0.024	-0.009
	(-0.852)	(-1.147)	(-1.212)	(-1.147)	(-1.181)	(-0.216)	(-0.438)	(-0.380)	(-0.185)
Constant	0.420***	0.272***	0.238***	0.272***	0.261***	0.249***	0.299***	0.290***	0.270***
	(-9.258)	(-7.377)	(-6.599)	(-7.377)	(-7.165)	(-10.320)	(-8.750)	(-10.742)	(-14.121)
Observations	1,367	1,296	1,271	1,296	1,287	906	1,225	1,045	695
R-squared	0.014	0.009	0.011	0.009	0.009	0.023	0.012	0.016	0.03
Adj. R-squared	0.009	0.004	0.005	0.004	0.004	0.016	0.006	0.009	0.021

t-statistics are displayed in parentheses.
Asterisks ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

All variables are defined in Table 2.2. This table reports coefficients of the following model:

$$TaxAvoid_{it} = \beta_0 + \beta_1 AfterTax_{it} + \sum_{n=2}^{j} \beta_n \, Controls_{it} + \varepsilon_{it}$$

Critically, there are many observations that appear to be clustered close to 0.00. As there is already a requirement for firms to make a profit in order to be included in the sample, then I suggest that these are likely the result of carry forward losses being claimed so they are simply an artifact of differences between accounting and taxations rules. In order to control for such problematic variations between accounting and taxation rules, I also exclude the lower 3% of observations as well, finding an improved adjusted R-squared and statistically significant coefficients (including positive association with ROA). This suggests that the range of observations should be between 0.03-0.33 (i.e., 939 observations), as shown in Appendix A.3.

Appendix A.3. Results of regression analysis for ETR (additional ranges).

VARIABLES	0 <= etr <= 0.36 etr	0 <= etr <= 0.33 etr	0.03 <= etr <= 0.36 etr	0.03 <= etr <= 0.33 Etr
AfterTax	-0.014**	-0.015**	-0.013**	-0.014**
	(-2.291)	(-2.325)	(-2.426)	(-2.548)
IndDir	-0.038*	-0.040*	-0.019	-0.022
	(-1.717)	(-1.788)	(-1.015)	(-1.147)
ROA	0.155***	0.136***	0.165***	0.145***
	(-3.093)	(-2.715)	(-3.549)	(-3.135)
SIZE	0.004**	0.004**	0.001	0.001
	(-2.042)	(-2.343)	(-0.486)	(-0.818)
LEV	0.029	0.015	0.069***	0.056***
	(-1.423)	(-0.741)	(-3.379)	(-2.683)
CapInt	-0.021	-0.01	-0.034*	-0.026
	(-0.955)	(-0.467)	(-1.810)	(-1.378)
R&D	0.094	0.159*	0.085	0.149*
	(-1.027)	(-1.703)	(-1.079)	(-1.875)
Constant	0.153***	0.132***	0.211***	0.193***
	(-4.391)	(-3.807)	(-7.016)	(-6.472)
Observations	1,145	1,032	1,052	939
R-squared	0.019	0.022	0.031	0.032
Adj. R-squared	0.013	0.015	0.024	0.025

t-statistics are displayed in parentheses.
Asterisks ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

All variables are defined in Table 2.2. This table reports coefficients of the following model:

$$TaxAvoid_{it} = \beta_0 + \beta_1 AfterTax_{it} + \sum_{n=2}^{j} \beta_n \, Controls_{it} + \varepsilon_{it}$$

2A.2 Sample Selection for CETR

A similar analysis and procedures are undertaken to identify the relevant range for the CETR measure employed in this study.

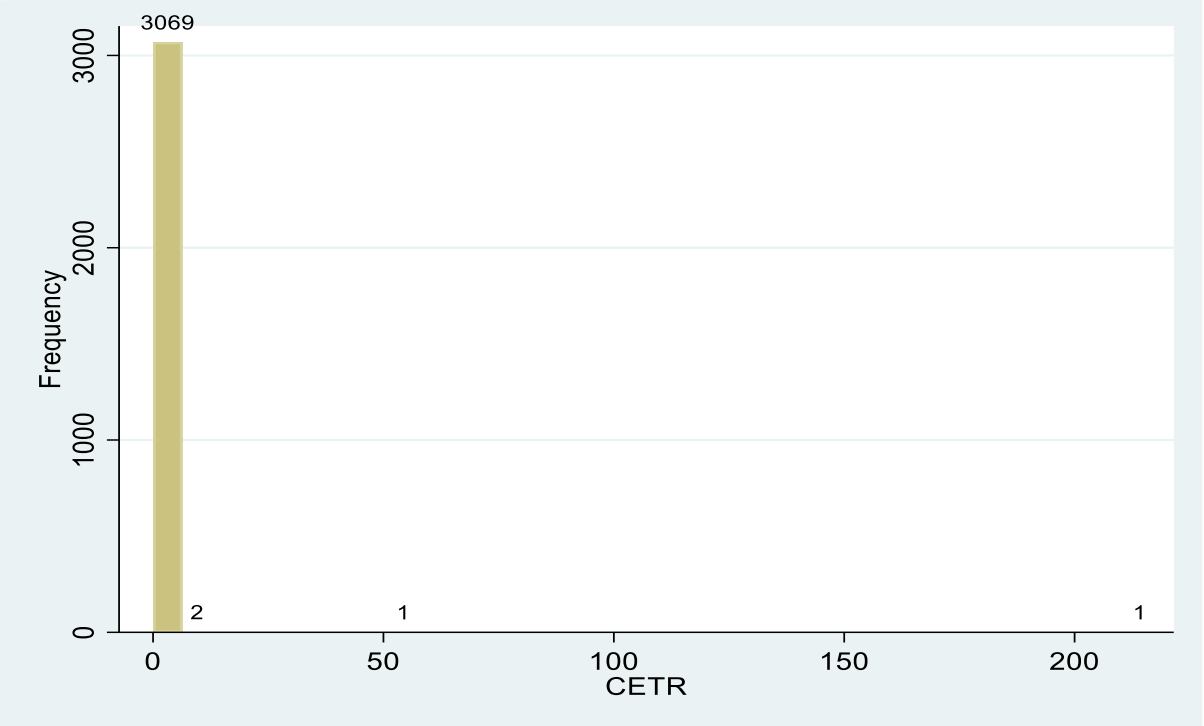
Initially, I hand collected my sample data from the Morningstar DatAnalysis database and then following Schwab et al. (2022) and the method set out by Tahir's (2023) working paper, I examined and attempted to identify the relevant range of CETR values for a realistic evaluation of tax avoidance.

The academic literature on tax avoidance commonly limits the range of values for the sample from 0 to 1 because the observations below 0 and above 1 are difficult to interpret (Stickney & McGee, 1982; Gupta & Newberry, 1997; Wang, 1991; Wilkie & Limberg, 1993).

Critically, as my study requires an evaluation of the level of, or potential for tax avoidance, values above the statutory tax rate in this setting (i.e., 30%) are less likely to represent tax avoidance and more likely to be caused by artifacts such as reversals of accruals or differences between accounting rules and taxation rules. Hence, it is simply logical to restrict the sample closer to the statutory tax rate, rather than follow the current literature on tax avoidance that generally accepts CETR values as high as 100%. The distribution of CETR values for the full sample, as illustrated by the histogram (Figure A2.7), demonstrates a wide range of values, with some exceeding 100%. Hence, values exceeding the 0 - 1 limits are excluded from the sample.

Figure A2.7

Histogram. Full Sample (N = 3,073), where pre-tax income (PI) >= 0.



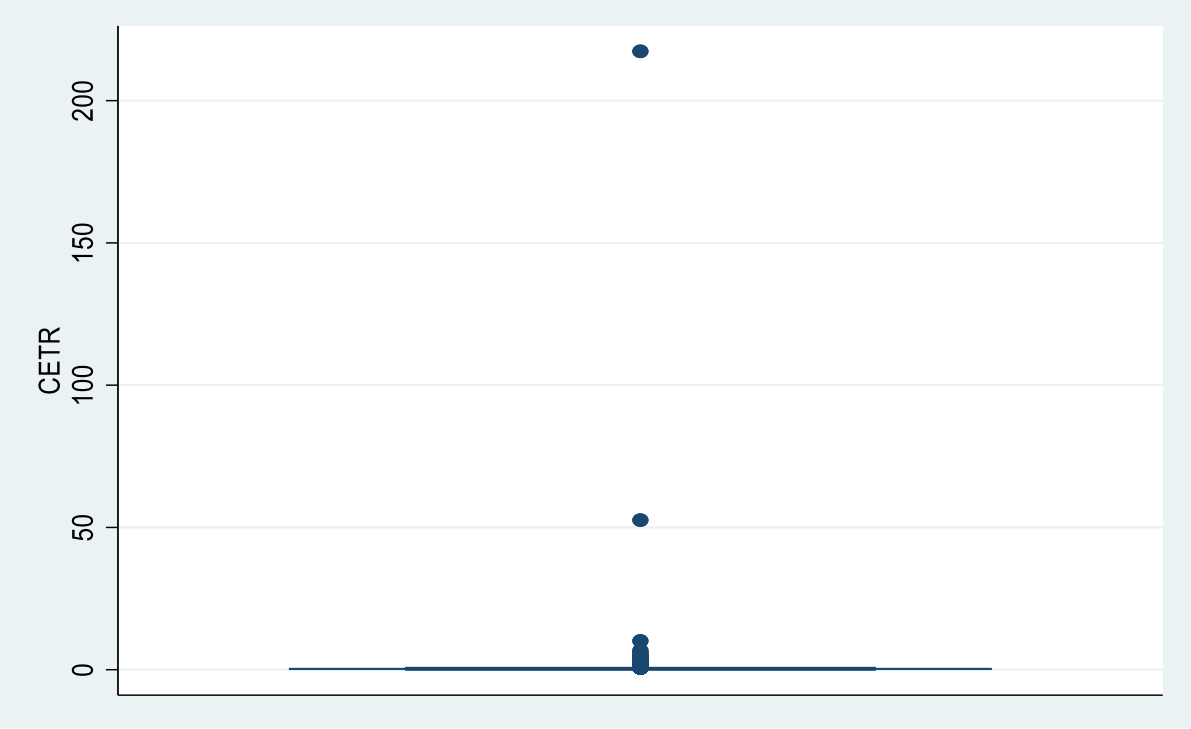
Appendix A.4 Descriptive statistics for CETR.

variable	N	Mean	Sd	min	p1	p5	p10	p50	p90	p95	p99	max
CETR	3073	0.397	4.048	0.000	0.000	0.003	0.043	0.267	0.480	0.646	2.126	217.333

An initial examination of the descriptive statistics (Appendix A.4) demonstrates that there are a small number of extreme observations that are so high above the statutory tax rate of 30% that it is unlikely that they exhibit tax avoidance. The subsequent boxplot (Figure A2.8) further highlights this issue.

Figure A2.8

Boxplot. Full Sample (N = 3,073).

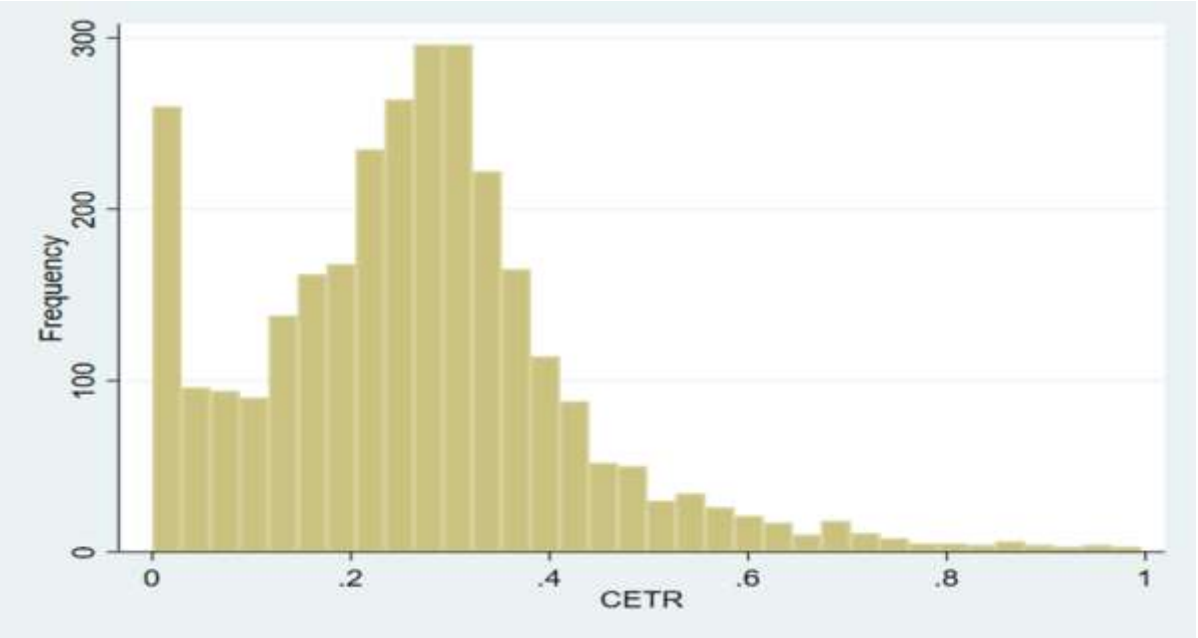


Next, I follow the procedures described in Schwab et al. (2022) and Tahir's (2023) working paper where it is suggested that some of the remaining values that appear at an extreme distance above the statutory tax rate of 30 per cent in the Australian setting remain problematic, requiring some additional sample restrictions. Upon examining the distribution of CETR values between 0 and 1, the histogram in Figure A2.9 demonstrates that, even after the aforementioned

exclusions, a long right-hand tail remains. Specifically, the remaining sample appears to be skewed to the right.

Figure A2.9

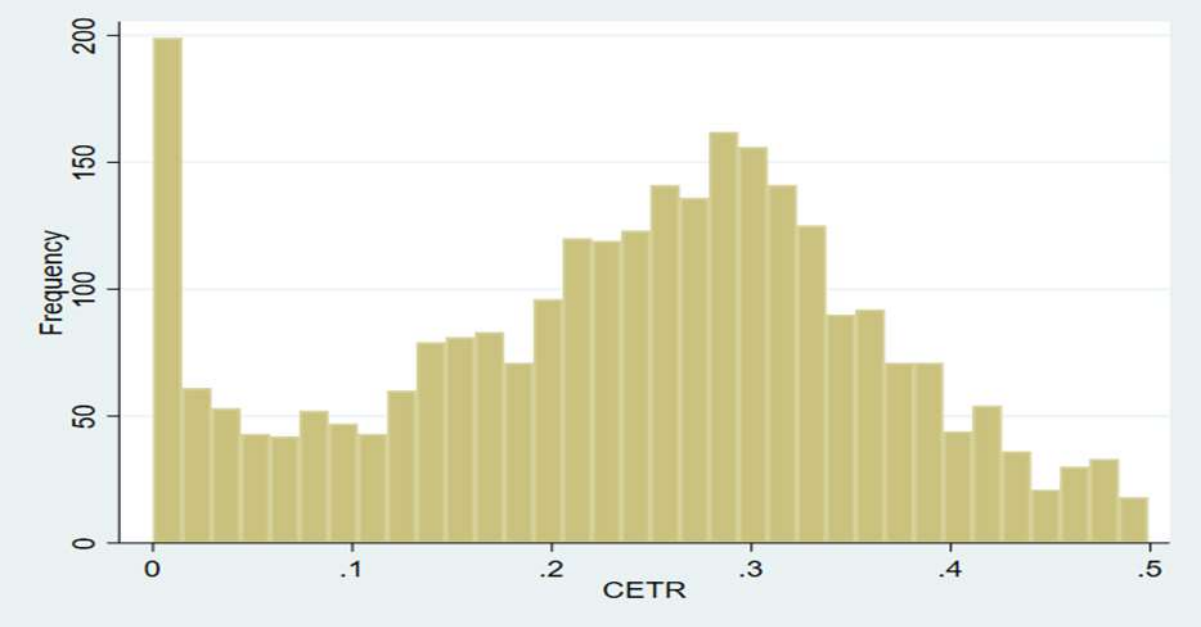
Histogram. Requirement: CETR >= 0 and CETR <= 1 and PI >= 0. (N = 2,999).



Visual examination reveals a decline in frequency of CETRs above 0.5. I reviewed numerous financial statements of firms in the long tail (with values between 0.5 and 1) and found that these firms commonly report high CETR values due to asset impairments – such as the impairment of goodwill. I argue that these observations do not exhibit tax avoidance, the topic of interest in this investigation, and that is why I also exclude them from the sample. After removing these observations from the sample, the range of CETR values is between 0 and 0.5. The resulting sample is presented in Figure A2.10.

Figure A2.10

Histogram. Requirement: CETR >= 0 and CETR <= 0.5 and PI >= 0. (N = 2,793).



Finally, I refine the sample by evaluating the variables in terms of goodness-of-fit and the statistical significance of the coefficients (including the size coefficient) using a basic regression model. Following commonly applied statistics techniques (Leys et al., 2013) I run regression models by using different sampling techniques (such as mean plus or minus 3, 2 and 1 standard deviations, median absolute deviation (MAD) plus or minus 3, 2 and 1 MAD around median, and finally 10% incremental increase over the base statutory rate (i.e., 10% of 30% = 3% increments). Figures 2.11 and 2.12 illustrate the resulting distribution of CETR values using the thresholds of CETR +/- 3 standard deviations and CETR +/- 3 MAD, respectively. This process allows me to identify appropriate restrictions for CETR ranges.

Figure A2.11

Histogram. Requirement: mean CETR +/- 3 sd & PI >= 0. (N = 2,793).

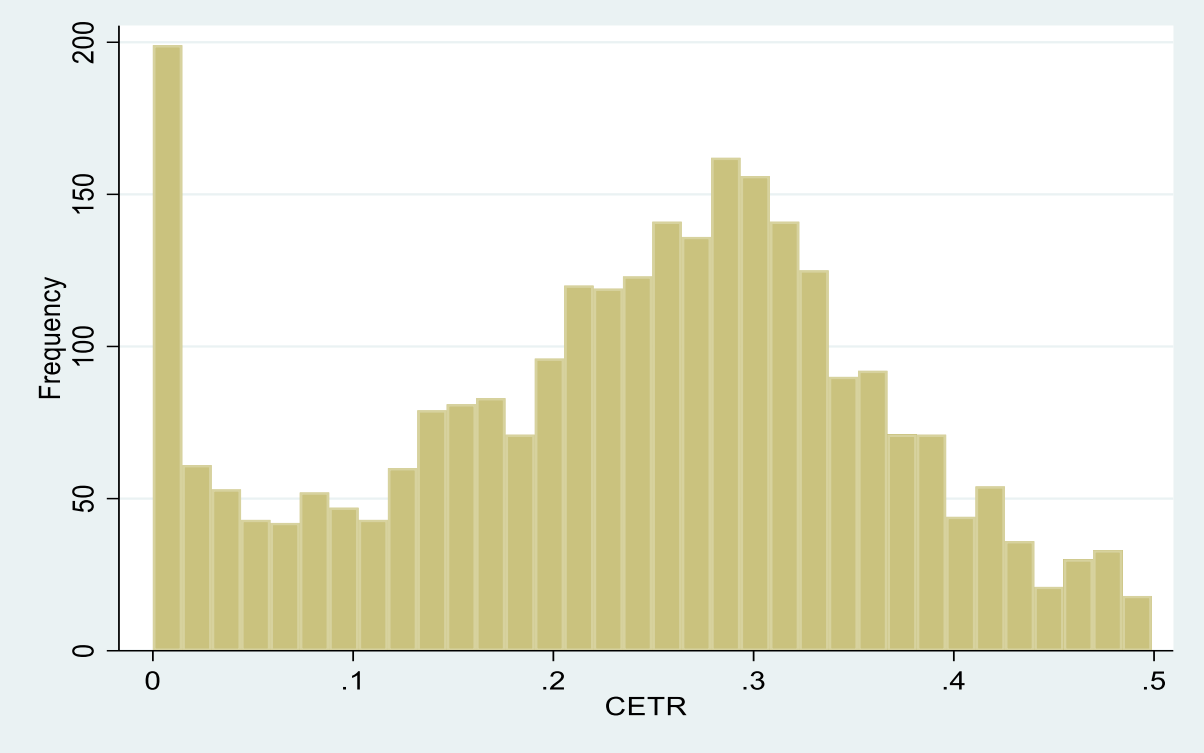
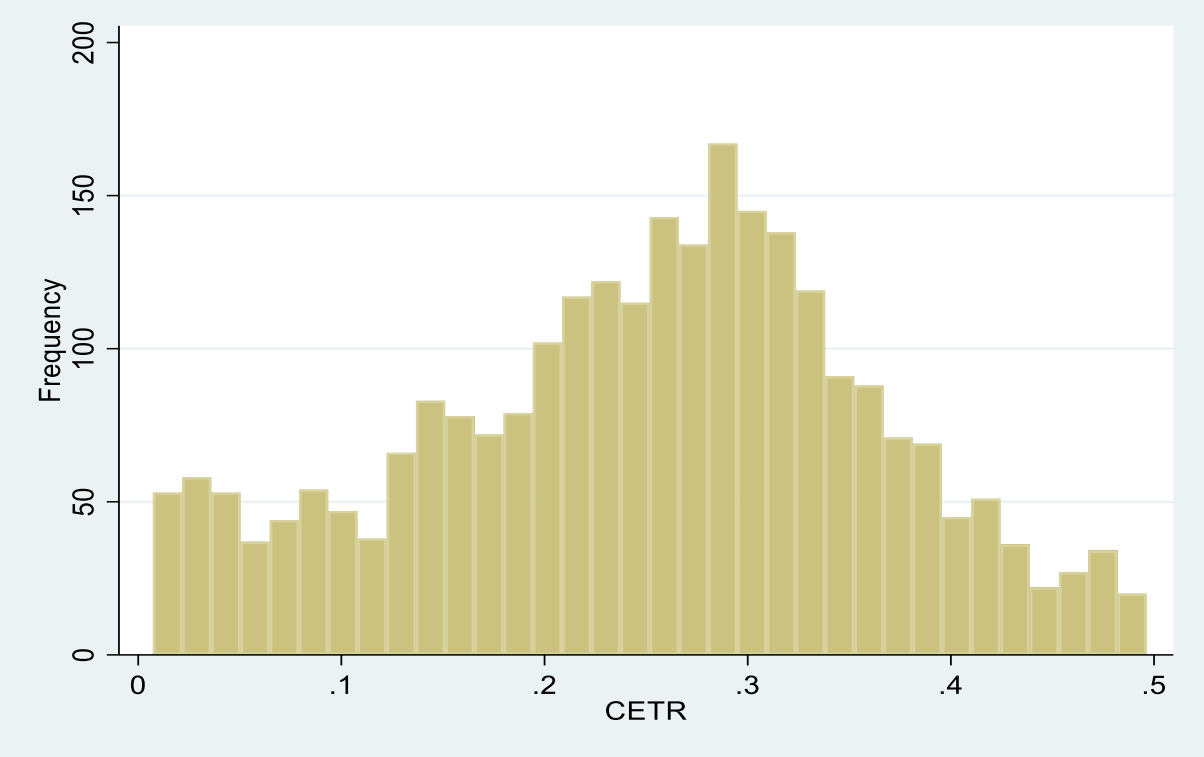


Figure A2.12

Histogram. Requirement: median CETR +/- 3 mad & PI >= 0. (N = 2,618).



Further, examination of the results requires consideration of the adjusted R-squared, statistical significance and coefficients of independent variables for different models to determine which range of CETR values provides the best results. The results (Appendix A.5 and Appendix A.6) demonstrate that restricting the CETR range to between 0.00 and 0.33 provides good fit.

Appendix A.5. Results of regression analysis for CETR.

VARIABLES	0 <= cetr <= 1 CETR	0 <= cetr <= 0.5 CETR	0 <= cetr <= 0.45 CETR	cetr +/- 3sd CETR	cetr +/- 2sd CETR	cetr +/- 1sd CETR	cetr +/- 3mad CETR	cetr +/- 2.5mad CETR	cetr +/- 1mad CETR
AfterTax	-0.013	-0.008	-0.008	-0.008	-0.008	-0.002	-0.006	-0.002	-0.007**
	(-1.478)	(-1.172)	(-1.166)	(-1.172)	(-1.178)	(-0.542)	(-0.901)	(-0.340)	(-1.970)
IndDir	-0.010	-0.041*	-0.044*	-0.041*	-0.044*	0.001	-0.030	-0.017	-0.008
	(-0.311)	(-1.665)	(-1.851)	(-1.665)	(-1.803)	(-0.067)	(-1.272)	(-0.954)	(-0.643)
ROA	-0.396***	-0.022	0.046	-0.022	0.005	0.122***	0.018	0.036	0.094***
	(-5.603)	(-0.380)	(-0.847)	(-0.380)	(-0.086)	(-3.046)	(-0.315)	(-0.801)	(-2.898)
SIZE	-0.006**	0.000	0.002	0.000	0.000	0.000	-0.001	-0.001	0.001
	(-2.227)	(-0.056)	(-0.749)	(-0.056)	(-0.105)	(-0.002)	(-0.709)	(-0.449)	(-0.476)
LEV	0.034	0.051**	0.039*	0.051**	0.046**	0.056***	0.080***	0.053***	0.043***
	(-1.180)	(-2.201)	(-1.750)	(-2.201)	(-2.018)	(-3.131)	(-3.185)	(-2.641)	(-2.931)
CapInt	-0.030	-0.011	-0.023	-0.011	-0.008	-0.049***	-0.031	-0.043**	-0.025*
	(-0.979)	(-0.461)	(-0.987)	(-0.461)	(-0.340)	(-3.143)	(-1.348)	(-2.390)	(-1.893)
R&D	0.178	0.135	0.110	0.135	0.133	-0.015	0.067	0.059	-0.061
	(-1.424)	(-1.369)	(-1.175)	(-1.369)	(-1.377)	(-0.235)	(-0.735)	(-0.872)	(-1.210)
Constant	0.430***	0.265***	0.228***	0.265***	0.260***	0.236***	0.291***	0.281***	0.244***
	(-8.941)	(-6.829)	(-6.088)	(-6.829)	(-6.819)	(-9.308)	(-7.859)	(-9.670)	(-12.005)
Observations	1,354	1,264	1,222	1,264	1,251	868	1,213	1,020	672
R-squared	0.032	0.01	0.009	0.01	0.009	0.027	0.014	0.015	0.032
Adj. R-squared	0.027	0.004	0.004	0.004	0.004	0.019	0.008	0.008	0.021

t-statistics are displayed in parentheses.
Asterisks ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

All variables are defined in Table 2.2. This table reports coefficients of the following model:

$$TaxAvoid_{it} = \beta_0 + \beta_1 AfterTax_{it} + \sum_{n=2}^{j} \beta_n \, Controls_{it} + \varepsilon_{it}$$

Critically, there are many observations that appear to be clustered close to 0.00. As there is already a requirement for firms to make a profit in order to be included in the sample, then I suggest that these are likely the result of carry-forward losses being claimed. In order to control for such problematic variations between accounting and taxation rules, I also exclude the lower 3% of observations, finding an improved adjusted R-squared and statistically significant coefficients (including positive association with ROA). This suggests that the range

of observations should be between 0.03-0.33 (i.e., 884 observations), as shown in Appendix A.6.

Appendix A.6. Results of regression analysis for CETR (additional ranges).

VARIABLES	0 <= cetr <= 0.36 CETR	0 <= cetr <= 0.33 CETR	0.03 <= cetr <= 0.36 CETR	0.03 <= cetr <= 0.33 CETR
AfterTax	-0.013**	-0.017***	-0.010*	-0.014***
	(-2.073)	(-2.684)	(-1.889)	(-2.626)
IndDir	-0.032	-0.039*	-0.011	-0.017
	(-1.416)	(-1.695)	(-0.564)	(-0.868)
ROA	0.166***	0.166***	0.177***	0.181***
	(3.150)	(3.173)	(3.585)	(3.695)
SIZE	0.004*	0.004**	0.001	0.002
	(1.868)	(2.192)	(0.740)	(1.065)
LEV	0.032	0.022	0.081***	0.074***
	(1.495)	(1.030)	(3.706)	(3.371)
CapInt	-0.027	-0.019	-0.050**	-0.043**
	(-1.212)	(-0.829)	(-2.569)	(-2.265)
R&D	0.092	0.140	0.062	0.107
	(0.982)	(1.460)	(0.776)	(1.323)
Constant	0.149***	0.129***	0.192***	0.174***
	(4.141)	(3.583)	(6.164)	(5.607)
Observations	1,080	978	986	884
R-squared	0.020	0.027	0.033	0.042
Adj. R-squared	0.014	0.020	0.026	0.034

t-statistics are displayed in parentheses.
Asterisks ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

All variables are defined in Table 2.2. This table reports coefficients of the following model:

$$TaxAvoid_{it} = \beta_0 + \beta_1 AfterTax_{it} + \sum_{n=2}^{j} \beta_n \, Controls_{it} + \varepsilon_{it}$$

The results show that in terms of goodness-of-fit and significance of the coefficients for regression models, the most relevant range of CETR is again between 0.03 and 0.33. My analysis further demonstrates that the same relevant range – between 0.03 and 0.33 – applies to both ETR and CETR.

Appendix A.7 Detailed sample derivation

Panel A: The sample is collected from the Morningstar DatAnalysis database (2004-2019)

Sample selection criteria	Firm-years	Unique firms
Firms listed on the Australian Securities Exchange	3213	549
Less:		
observations with missing values	1826	280
observations outside the ETR range (0.03–0.33)	475	19
Final sample	912	250

This table outlines the sample selection process based on data from the Morningstar DatAnalysis database for 2004–2019. Starting with 3,213 firm-year observations (549 unique firms) listed on the ASX, the sample is reduced by excluding observations with missing values and those outside the effective tax rate (ETR) range of 0.03–0.33, resulting in a final sample of 912 firm-years representing 250 unique firms.

Panel B: Industry classification

Industry description (GICS code)	Firm-years	Unique firms	Relative frequency (%)
Communication Services (4510)	76	19	8.33%
Consumer Discretionary (2510)	252	65	27.63%
Consumer Staples (3010)	72	17	7.89%
Energy (1010)	28	9	3.07%
Financials (4020)	4	2	0.44%
Health Care (3510)	66	17	7.24%
Industrials (2010)	181	57	19.85%
Information Technology (5010)	91	24	9.98%
Materials (1510)	107	29	11.73%
Real Estate (6010)	34	10	3.73%
Utilities (5510)	1	1	0.11%
Total	912	250	100%

This table presents the industry distribution of the final sample based on GICS classifications. The largest representation is from the Consumer Discretionary (27.6%) and Industrials (19.9%) sectors, followed by Materials (11.7%) and Information Technology (10.0%). Other industries, including Financials and Utilities, account for a small share of the sample.

Panel C: Distribution of the sample by year

Year	Firm-years	Relative frequency (%)
2004	34	3.73%
2005	33	3.62%
2006	44	4.82%
2007	54	5.92%
2008	62	6.80%
2009	49	5.37%
2010	57	6.25%
2011	63	6.91%
2012	70	7.68%
2013	59	6.47%
2014	49	5.37%
2015	54	5.92%
2016	67	7.35%
2017	65	7.13%
2018	81	8.88%
2019	71	7.79%
Total	912	100%

This table shows the distribution of firm-year observations across the 2004–2019 period. The sample is relatively balanced over time, with a gradual increase in observations toward the later years. The highest representation occurs in 2018 (8.9%) and 2019 (7.8%), indicating broader data coverage in the most recent periods.

Appendix A.8 Two-sample t-test for ETR (*BeforeTax* vs *AfterTax* subsamples)

Group	Obs	Mean	Std Err	Std Dev
$BeforeTax_{it}$	551	0.228	0.003	0.074
$AfterTax_{it}$	361	0.213	0.004	0.082
Combined	912	0.222	0.003	0.078
Difference		0.015	0.005	
t-stat. = 2.899	df = 910	p-value = 0.004		

All variables are defined in Table 2.2.
This table reports the results of a two-sample t-test comparing mean ETRs between the *BeforeTax* = 0 and *AfterTax* = 1 subsamples. The difference in means (0.015) is statistically significant (t = 2.90, p = 0.004).

Chapter 3

Did the positive impact of legislative strategies to constrain multinational corporate tax avoidance survive the 'PwC tax scandal'?

3.1 Introduction

Globally, significant political and public concerns regarding Corporate Tax Avoidance (CTA) and its effect on government revenue continue to be raised. For instance, in the United States, corporate contributions to tax revenue fell by 25% from 1996 to 2012, and the rise in non-repatriated profits held by large corporations in lower tax jurisdictions – exceeding USD $1.9 trillion – suggests that CTA is a contributing factor (Levin, 2013). In April 2021 President Biden stated that "a new, independent study put out last week found that at least 55 of our largest corporations use the various loopholes to pay zero federal income tax in 2020" (The White House, 2021). He then stated that "it's just not fair. It's not fair to the rest of the American taxpayers" (The White House, 2021). In Australia the inaugural Corporate Transparency Report was issued for the financial year 2013/14 with alarming findings. For instance, it revealed that 36% of the largest public and multinational entities paid no tax during 2013/14 (Hutchens, 2016) as opposed to 31% in 2022/23 (ATO, 2024a), all whilst many of these companies were generating billions in gross revenues. Notably, amongst these entities were Qantas, Lendlease, ExxonMobil, Chevron, and Glencore (Australian Government, 2024a). Accordingly, the development of legislative strategies aimed at addressing CTA in Australia has accelerated in the past 10 years.

In order to combat tax avoidance by multinational corporations (MNCs), two unilateral strategies were enacted by the Australian Federal Government:

(1) the Tax Laws Amendment (Combating Multinational Tax Avoidance) Act, 2015 (referred to as the Multinational Anti-Avoidance Law or MAAL) and

(2) the Treasury Laws Amendment (Combating Multinational Tax Avoidance) Act, 2017 (referred to as the Diverted Profits Tax or DPT).

MAAL was established to constrain CTA strategies employed by Significant Global Entities (SGEs) so that they pay tax on their actual (as opposed to declared) profits in Australia by decreasing the incidence of recognising revenues in lower tax jurisdictions. This applies to income years commencing on or after 1 January 2016. The DPT aims to ensure that tax paid by SGEs properly reflects the economic substance of their activities in Australia and prevents the diversion of profits offshore through arrangements involving related parties. With a rate set at 40%, significantly higher than the standard statutory rate of 30%, the DPT aims to discourage entities from shifting profits out of Australia via such arrangements.

There is evidence that the two unilateral strategies legislated by the Australian Federal Government – the MAAL and the DPT – were at least initially (within one year of the effective start date) effective in combating CTA by MNCs (Wells et al., 2024). However, a challenge is that while MAAL and DPT seem to have had some initial success in constraining CTA, the 'PwC tax scandal' suggests the incentive for CTA was not eliminated as strategies to obfuscate the legislation were developed soon after (Queensland Law Society, 2024). Hence, the objective of this chapter is to evaluate whether the impact of MAAL and DPT persisted beyond the findings of Wells et al. (2024) given the existence of incentives for CTA one year after the effective implementation date of MAAL and DPT.

The motivation for this chapter is provided by the media attention currently being focused on the PwC tax scandal. Specifically, the role PwC held as both an adviser to Government and the Australian Taxation Office (ATO) on tax policy, including on MAAL and DPT, and subsequently to MNCs on tax avoidance strategy (Tadros & Chenoweth, 2023). The potential conflict of interest has been discussed extensively in the media (Ainsworth, 2023; Chenoweth, 2023; Tadros & Chenoweth, 2023). The allegation is that PwC may have used its position as a consultant in helping the ATO to develop MAAL and DPT to subsequently promote to MNCs strategies to avoid that legislation (Tadros & Chenoweth, 2023). Hence, the

concern is that the initial positive impact of MAAL and DPT may have been quickly circumvented, as evidenced by the PwC tax scandal (Tadros & Chenoweth, 2023). This will also provide insights more generally into the long-term effectiveness of unilateral legislative strategies such as MAAL and DPT which aim to merely constrain CTA, but without a mechanism (such as dividend imputation) to address the incentives for CTA. This tends to lead to counter strategies soon after, suggesting that the incentives for CTA may persist. The PwC tax scandal is an extreme example thereof. Preferably, legislative strategies must balance the need to be sufficiently specific to be legally enforceable and sufficiently robust to survive judicial challenge.[14] Otherwise the impact thereof could be diminished by the development of alternative tax avoidance strategies in due course.

Evaluating CTA is difficult because it cannot be directly measured. As a result, it requires the use of an appropriate proxy for the research question (Hanlon & Heitzman, 2010). Common proxies for tax avoidance include the Effective Tax Rate (ETR), cash effective tax rate (CETR), GAAP ETR and long-run cash effective tax rate (Hanlon & Heitzman, 2010; Dyreng et al., 2008). Due to the limited research in this field (the impact of legislative changes on CTA), this chapter is constrained by the available data on specific tax avoidance strategies used by MNCs which are a result of the opaque nature of CTA. However, Australia is a unique setting for three reasons. The ATO since 2014 is required to disclose tax return data for companies with a total income greater than $100 million. That includes total income, taxable income and tax payable are disclosed as per the Tax Laws Amendment (2013 Measures No.2) Act 2013. Next Australia is unique with respect to enacting two unilateral legislative strategies to constrain CTA, MAAL and DPT, which have the objective of increasing total income declared and more specifically tax payable. Therefore, the aims of MAAL and DPT can be

[14] It is doubtless this impacted the decision to target MNCs generally with the MAAL and DPT, not just foreign MNCs, notwithstanding there having little relevance to Australian MNCs.

measured directly by analysing the ATO tax return data without the need to rely on a proxy such as an ETR. Finally, in 2023 the 'PwC tax scandal' (also referred to as 'PwC tax leaks scandal') was made public, indicating that attempts to circumvent the legislated anti-avoidance measures began well before they took effect, suggesting-that incentives for CTA remained and were actioned. Armed with those critical factors that are unique to Australia, and following on from Wells et al. (2024), the ATO tax return data is used to determine[15] CTA to evaluate MAAL and DPT several years after the policies took effect given the persistence of incentives for CTA which became apparent by way of the PwC tax scandal. The chapter therefore also draws upon information available in the mass media, Senate inquiries and meetings, and investigations by the ATO, the Tax Practitioners Board and the Australian Federal Police (AFP) regarding the PwC tax scandal.

An increase in tax revenues was recognised in Australia by foreign SGE firms immediately after the passage of the legislation, however there are concerns that this declined in subsequent years due to the PwC tax scandal (Wells et al., 2024; Chenoweth, 2023; Ainsworth, 2023). It is likely that the tax avoidance strategy associated with the PwC tax scandal involved the recognition of revenues in jurisdictions outside Australia in a scheme that was able to obfuscate the MAAL (Chenoweth & Tadros, 2023; Lowrey, 2023). Although to this date no specific information has been released with respect to any such schemes, suggestions have been made that foreign special purpose entities and trusts were employed to declare Australian total income in, and/or to transfer taxable income to lower tax jurisdictions. Thus, while MAAL and DPT seem to have constrained certain CTA schemes initially (Wells et al., 2024), they did not eliminate the incentive for new schemes as evidenced by the PwC tax scandal. The relevant question following on, and as suggested for future research by Wells et

[15] The ATO disclosures contain directly observable CTA measures applicable to MAAL and DPT. Therefore CTA proxies are not required making the current study one of the very few to use directly observable CTA data.

al. (2024) is: did total income and/or tax payable decline in subsequent years for foreign SGE firms? Although the exact lag between the effective start date of MAAL/DPT and when such a decline could occur is *a priori* difficult to indicate given that the investigation of the PwC tax scandal has just started.

This study is based, in the first instance, on a sample of 1,612 firms for which complete ATO tax return disclosures are available for the 2016/17 and 2017/18 years. Notably, a significant number of firms (197) that appeared on the ATO disclosure list for the 2016/17 year, failed to meet the threshold for disclosing tax return information in the 2017/18 year. Rather than excluding these firms, additional analysis is undertaken with these firms included in the sample and assuming that the revenue threshold for inclusion corresponds to the firm's revenue in the 2017/18 year. A similar analysis is conducted for the 2018/19 and 2019/20 years (which includes the latest data available). The results suggest that while some foreign SGE firms reported relatively higher revenues than non-SGE firms, in subsequent periods other foreign SGE firms reported significantly lower revenues than non-SGE firms. This is expected given the time necessary for the diffusion and implementation of a tax strategy that avoided revenue recognition in Australia. In summary, these results potentially indicate that in the year following the passage of the MAAL (and the DPT), a new strategy emerged to avoid the declaration of revenue generated in Australia with the ATO.

This chapter makes a number of contributions to the literature. The conflict of interest is obvious with respect to the PwC tax scandal. This doubtless contributed to the (speed of) development of strategies to circumvent the legislation and thus raises a question related to the long-term success of MAAL and DPT. Resolving that question will provide policy makers with critical evidence needed to better develop unilateral legislative strategies to persistently constrain CTA (Wells et al., 2024). The conflict of interest arising from the involvement of PwC in the development of the legislation and its subsequent promotion of strategies to avoid

MAAL and DPT, is of broader concern as well, as these conflicts are little different from the involvement of countries facilitating CTA in the development of multilateral strategies. Hence the insights provided may be more broadly applicable and contribute to legislative strategies more generally. Finally, a limitation of legislative strategies to constrain CTA is that they may not constrain the incentives for CTA. Hence, there will always be a 'market' for strategies for CTA and the results here should encourage the development of policies that both constrain and disincentivise CTA.

This research is not without limitations, but the benefits of the contributions far outweigh them. The ATO disclosures are limited to three (3) tax return items[16] and thus it is difficult to apply multivariate methods to investigate the association between the effectiveness of MAAL and DPT with respect to other factors (cross-sectionally). Expansion of the data provided by the ATO, and in particular the disclosure of losses carried forward would enable more precise evaluation of CTA. This might also include the disclosure of the entities that are subject to the MAAL (i.e., SGE firms). The inability to integrate and easily match ATO data with data obtained from other sources such as public financial reports prevents multivariate analysis. Further, if corporate filings with the Australian Securities and Investments Commission were readily available for all companies (i.e., not pay per view) and in a machine-readable format (i.e., digital financial reporting) it would enable the determination of when a tax avoidance strategy was applied, allowing for significantly stronger tests.

The remainder of this chapter is organised as follows. In section 2 the relevant literature is reviewed, and the regulatory context is described. This culminates in the development of hypotheses. The research design is outlined in section 3. Sample selection and description are addressed in section 4 and the results presented in section 5. Finally, the conclusions are presented in section 6.

[16] The three tax line items include: Total Income, Taxable Income and Tax Payable.

3.2 Regulatory context and hypotheses

The tax literature commonly focuses on how firms' tax strategies affect corporate taxation, typically considering the costs and benefits of CTA (Hanlon & Heitzman, 2010). Research has highlighted several advantages of CTA, including higher after-tax profits and increased earnings per share (Hanlon & Slemrod, 2009; Powers et al., 2016), lower tax liabilities and better liquidity (Saavedra, 2013). Conversely, it has also identified various direct costs, including legal fees and transaction costs (Rego & Wilson, 2012; Wilson, 2009). Additionally, there may be significant indirect costs if tax avoidance is uncovered, including reputational costs (Lanis & Richardson, 2013), heightened political and regulatory scrutiny (Hoi et al., 2013), and the potential for social sanctions and penalties (Desai & Dharmapala, 2006; Lanis et al., 2020).

Although it is acknowledged that legislation might have an impact on CTA, this topic has received relatively little focus in the academic literature for several reasons. CTA came into prominence after the Global Financial Crisis and since then, governments, tax authorities and academics have put an emphasis on understanding the nature of CTA and more importantly the costs thereof to the community. Thus, legislative responses at any level around the world are rare until recently. In the academic literature, research and discussion have centred on the cross-sectional variations in CTA, which naturally shifts the focus to firm characteristics. While the effects of legislative changes on CTA are recognized, they are not directly tested but rather accounted for by including controls for the years in which these changes occur (i.e., year effects). There are a few notable exceptions, concerning major tax reforms like the alternative minimum tax (Dhaliwal & Wang, 1992) and the Tax Cuts and Jobs Act (Gale et al., 2018) in the United States, along with measures implemented by the Australian government to tackle base erosion and profit shifting (Tran & Xu, 2024). However, a challenge with these studies is that tax changes often coincide with extensive economic policy shifts and are broadly applied

to firms. As a result, any legislative effects on tax are likely to be mixed, making it difficult to empirically assess their immediate impact.

Critically, limited research on how legislative changes affect CTA does not imply a lack of interest in the topic (Wells et al., 2024). There are significant political and public concerns regarding CTA and its effect on government tax revenue. For instance, in the United States, corporate contributions to tax revenue fell by 25% from 1996 to 2012, and the rise in non-repatriated profits held by large corporations in lower tax jurisdictions – exceeding USD $1.9 trillion – suggests that CTA is a contributing factor (Levin, 2013). In Australia, the government established the Tax Avoidance Taskforce in 2016 to constrain tax avoidance by large and wealthy taxpayers, particularly MNCs. It was projected to raise more than $3.7 billion in additional tax liabilities by July 2020 (Australian National Audit Office, 2019; Khadem, 2016). Nevertheless, evidence of CTA, being a revenue driver for the legal and accounting profession, has prompted the development of unilateral legislative strategies aimed at addressing CTA in a few countries and in particular in Australia since 2013.

In Australia, the Tax Laws Amendment (2013 Measures No. 2) Act 2013 (No. 124, 2013) mandates the annual publication of a corporate tax transparency report. The inaugural Corporate Transparency Report was issued for the financial year 2013-14. The findings were alarming, revealing that more than one-third of the largest public companies and multinational entities – specifically, 36% in 2013/14 – paid no tax during that period (Hutchens, 2016). A similar situation was observed in the 2014/15 year, with 36% of firms paying no tax (ATO, 2016). Among the companies that generated billions in revenue during the 2013/14 and 2014/15 years but paid no tax were Qantas, Lendlease, ExxonMobil, Chevron, and Glencore (Australian Government, 2024a, 2024b). Firms can generate significant revenues while still not paying taxes for several reasons. They may report an accounting loss or, despite showing an accounting profit, face reconciliation items that result in a tax loss, such as deductions

allowed at higher rates than those recognized in accounting. Additionally, they might have taxable income but qualify for offsets, like the research and development incentive, that can equal or exceed their tax liability. Further, if they have taxable income but also have prior-year losses available for deduction against that profit, they may end up with no tax owed.

Overall, these trends around the globe and in Australia highlight a critical need for comprehensive reforms to specifically address CTA and ensure that MNCs contribution to government tax revenues remain aligned with economic reality, community needs and tax fairness principles. To address this the U.K. government passed the Finance Act, 2015, which would be characterised as a unilateral legislative strategy (Finance (No. 2) Act 2015 (UK)). This aimed to impose taxes on firms structuring their affairs to recognise revenues in tax jurisdictions where little or no tax is payable, and it was colloquially referred to as the 'Google Tax' or more formally as a diverted profits tax. However, this strategy for constraining CTA has been subject to criticism (Fleisher, 2014) and there have been questions raised over whether it has been successful (McIlroy, 2017). A catalyst for some of these criticisms is the minimal amount of corporate tax payments directly attributable to the Finance Act 2015. However, this likely understates its effectiveness if it results in greater corporate tax payments made in accordance with other corporate tax legislation. A likely outcome due to the punitive nature of the 'Google Tax'. Further, there is a lack of transparency about tax payments in the U.K., making it difficult to assess whether this unilateral legislative strategy was successful initially, and whether this success persists. The U.K. does not have equivalent tax transparency legislation (Tax Laws Amendment (2013 Measures No.2) Act 2013) that provides for disclosure of tax return data, making it impossible to measure the direct effect of the Finance Act 2015 on tax revenue and tax payable.

Other critics of the U.K. Finance Act 2015 have questioned whether CTA can be constrained by unilateral legislative strategies and advocated multilateral legislative strategies

to address what is considered by many to be a global challenge. Perhaps the highest profile and longest running multilateral strategy is the Base Erosion and Profit Shifting (BEPS) initiative being developed by the Organisation for Economic Co-operation and Development (OECD) which commenced in 2013 (OECD, 2013). However, a feature of the development of multilateral strategies is that negotiations are protracted, with reports and recommendations that are replete with compromises that potentially undermine their effectiveness. Further, there is evidence of some countries resisting and/or undermining such strategies which reflects the self-interest of those involved in negotiations. In these negotiations the conflicts of interest are readily apparent. These challenges are apparent with the proposed Global Minimum Tax Rate, which raises the question of whether legislative strategies generally, both unilateral and multilateral, can be successful in the longer term. Unfortunately, with respect to the Global Minimum Tax Rate this will be difficult to evaluate due to complexity, but if there is evidence of responses to unilateral legislative strategies it is likely that this will also occur for multilateral legislative strategies (Alderman et al., 2021).

3.2.1 Legislative strategy for constraining CTA in Australia

In Australia a unilateral legislative strategy for constraining CTA was adopted and it was similar in nature to the U.K. Finance Act, 2015. This was enacted in the Multinational Anti-Avoidance Law (MAAL) and then in the Diverted Profits Tax legislation (DPT) (Tax Laws Amendment (Combating Multinational Tax Avoidance) Act 2015; Treasury Laws Amendment (Combating Multinational Tax Avoidance) Act 2017). Both were incorporated in the anti-avoidance section (Part IVA) of the Income Tax Assessment Act 1936, giving the ATO significant enforcement powers and limiting the potential scope of international tax treaties. At the time it was generally accepted that certain SGE firms were declaring Australian revenue

(total income) in, and/or transferring Australian profits (taxable income) offshore to lower tax jurisdictions, thereby avoiding paying tax in Australia (Morrison, 2015). MAAL,[17] by constraining tax avoidance strategies used by SGE firms, aimed to increase total income declared in Australia, and DPT,[18] by setting a higher rate than corporate tax to address profit shifting by SGE firms, were both aimed at increasing taxable income and tax paid/payable in Australia. The objective being to get SGE firms to pay tax on 'actual' profits earned in Australia. The anti-avoidance legislation appears to target primarily foreign MNCs which is why they are referred to in the chapter as foreign SGE firms, while firms to which the legislation does not apply are referred to as non-SGE firms.[19] The reason for making the legislation applicable to all SGE firms (foreign and Australian) is to avoid any suggestion of discrimination against foreign SGE firms and therefore potential legal challenges to MAAL.

Insights into the success of this strategy, at least initially, are provided by Wells et al. (2024), which identified a general increase in total income (revenue) and tax payable declared in Australia by foreign SGE firms the year after the effective date of MAAL and DPT. However, these results were limited to analysing ATO data the year after the effective date of MAAL and DPT which would have made it difficult for tax aggressive SGE firms to immediately change or modify their tax strategies. Thus, Wells et al. (2024) called for future research to include additional ATO data to test the persistence of this effect especially in light of the fact that neither

[17] The MAAL applies to firms other than investment entities belonging to corporate groups with global turnover of more than AUD$1 billion and these are labelled significant global entities (SGEs). Critically, this provides a clear basis for identifying firms targeted by this legislation. The essence of this strategy is that it sought to address obfuscation by MNCs about entities within their group structure (not) having a "permanent establishment" in Australia. This facilitated the recognition of revenues (total income) outside Australia (in lower tax jurisdictions), thus transferring any profits out of Australia. The legislation allows the ATO to determine whether a "permanent establishment" exists in Australia based on "economic substance" and having regard to all entities within a group. In practical terms MAAL is aimed at stopping MNCs having a service entity in Australia to undertake marketing and facilitating the delivery of its services in Australia but recognising revenue through a different entity registered in another jurisdiction (PwC, 2016).

[18] DPT is the second legislative strategy employed by the government, which was introduced in the 2016 budget. The DPT rate is set at 40%, higher than the normal statutory rate of 30%, and is designed to ensure that the tax paid by SGEs accurately reflects the economic substance of their activities in Australia, and it is also intended to provide a disincentive to divert profits from Australia through arrangements involving related parties in particular (ATO, 2024b).

[19] SGEs is the formal definition of MNCs in MAAL and DPT and thus can be used interchangeably.

MAAL nor DPT eliminated the incentive for CTA. That is, the benefits of CTA were likely greater than the costs despite the provisions of MAAL and DPT.

3.2.2 Hypotheses

In the absence of any significant change in the incentives for CTA by SGE firms, it is expected that new CTA strategies would eventually be developed with the help of consultants, and the initial success of the legislative strategies to constrain CTA would diminish. In the years after the effective date of MAAL and DPT there would have been increasing familiarity with the legislation and a greater opportunity to develop and implement strategies to obfuscate the legislation. The exact number of years is difficult to observe and is likely to be different for tax aggressive SGE firms that initially complied with the new legislation. However, the disclosure in the media in 2023 with respect to the PwC tax scandal adds some clarity to this view. Firstly, the incentive for CTA remained despite MAAL and DPT, confirming that this unilateral legislative strategy acts as a temporary constraint for CTA, thereby diminishing success. This is akin to a common view that the accounting and law firms are always one step ahead of the tax and regulatory authorities with respect to tax minimization and avoidance schemes. Further, it suggests that after the initial success of MAAL and DPT in achieving their aims further success would diminish and possibly reverse in an accelerated manner given the conflicts created by the involvement of PwC in the development of the legislation, and subsequently promoting strategies to avoid the legislation (Ainsworth, 2023; Tadros & Chenoweth, 2023; Tadros, 2024). That is, rather than developing counter strategies within five years of MAAL and DPT one would expect to see some effect whereby total income and tax payable reverse the initial increase as per Wells et al. (2024) within several years.

The PwC tax scandal in Australia revolves around serious allegations of misconduct involving the firm's tax advisory services, focused on actions that began in 2015 (Barret, 2023; Belot, 2023). The controversy erupted when it was revealed that Peter Collins, who was then PwC Australia's international tax chief and a consultant to the Australian Federal Government on tax policy and MAAL and DPT specifically, had breached confidentiality agreements by sharing sensitive information about the upcoming multinational anti-avoidance tax laws (MAAL and DPT) with PwC colleagues. These agreements, which Peter Collins signed during his work for the Australian Federal Government on tax law design, explicitly prohibited the disclosure of such information for obvious reasons (Chenoweth & Tadros, 2023).

This breach allowed PwC to exploit insider knowledge, devising strategies for companies to circumvent the new multinational anti-avoidance tax laws (MAAL and DPT) much quicker than one would otherwise expect. As a result, PwC used this confidential information to attract new clients and generate revenue (Chenoweth & Tadros, 2023). This conduct not only undermined the integrity of the tax system but also raised significant concerns about the ethical standards upheld by one of the world's leading professional services firms. This public disclosure of the scandal led to heightened scrutiny and backlash against both PwC and the Australian Federal Government, sparking widespread public outrage and calls for accountability (Ainsworth, 2023; Barret & Bashford Canales, 2024). It has also given rise to the Senate Economics Legislation Committee's inquiry and the release of the Treasury Laws Amendment (Tax Accountability and Fairness) Bill 2023 in May 2024, raids by the AFP of PwC offices in November 2024 and the resignation of hundreds of PwC staff since 2023 (Treasury Laws Amendment (Tax Accountability and Fairness) Bill 2023 (Cth); Kruger, 2024). There was also the Parliamentary Joint Committee on Corporations and Financial Services

Inquiry into Ethics and Professional Accountability, with the final report being released in November 2024 (Parliament of Australia, 2024).[20]

In response to the PwC tax scandal, the Australian Federal Government announced a package of reforms in August 2023, aimed at addressing misconduct and restoring public confidence in the integrity of the tax system and capital markets. The reforms will include proposed laws and penalties to prevent unethical behaviour, focusing on enhancing the integrity of the tax system, expanding the powers of regulatory bodies, and strengthening regulatory frameworks to ensure their effectiveness (Chalmers, 2023). A timeline of events related to the PwC tax scandal can be found in Appendix B.1.

Whether the new CTA strategies developed by PwC targeted the MAAL and/or DPT, or a combination of the two is an interesting question that cannot be determined without detailed knowledge of the new tax avoidance strategy. Unfortunately, that detail has not been made public to date. Nor do we know at this stage which SGE firms were sold the new tax avoidance schemes and when. Hence, the following hypotheses.

H_1: *While there was in general an initial increase (after 1 year) in total income (revenues) for foreign SGE firms after passage of MAAL, this impact to some degree diminished (reversed) within 3 years.*[21]

H_2: *While there was in general an initial increase (after 1 year) in tax payable for foreign SGE firms after passage of DPT, this impact to some degree diminished (reversed) within 3 years.*

[20] The Final Report of the Parliamentary Joint Committee on Corporations and Financial Services Inquiry into Ethics and Professional Accountability proposes the operational separation of large multidisciplinary firms. Under this recommendation, firms will no longer be allowed to offer both audit and non-audit/consulting services to the same client. This is a key recommendation aimed at preventing firms from facing ongoing conflicts of interest and compromising their audit services due to the pressure to retain clients in more profitable areas of their business (Parliament of Australia, 2024). The report also provided 39 other recommendations.

[21] Limiting the impact to 3 years is due to data availability as discussed in section 3.4 (sample and data description) below.

3.3 Research design

A major constraint on the research design is due to data availability, which is limited to information provided annually by the ATO in accordance with the *Tax Laws Amendment (2013 Measures No.2) Act 2013.* This information is the company name, Australian business number, total income (revenue), taxable income (but not tax losses) and tax payable. Since the data is recorded annually and covers multiple years, it is structured as a time series, meaning that each entry corresponds to a specific year. Because of this, it is important to use a method that can account for trends and patterns over time (Hamilton, 1994). To test my hypotheses, I focus on a key variable – either total income or tax payable – recorded over multiple periods. Given this data structure, autoregressive (AR) models are particularly well-suited for my research and analysis, as they leverage past values of a time series to predict future observations, assuming a degree of persistence and correlation across time (Hamilton, 1994). This statistical method is widely used in economics and finance to study patterns in financial data when only a limited amount of historical information is available (Enders, 2014).[22]

Because the data is recorded once per year, more advanced models, such as Autoregressive Moving Average and Autoregressive Integrated Moving Average, are not necessarily required unless the data shows additional complexities like seasonal fluctuations or long-term instability (Enders, 2014). The autoregressive model is particularly suitable for this research because it effectively captures how corporate tax data evolve over time while keeping

[22] There is also cross-sectional analysis that is widely used in accounting research due to its ability to generate statistically powerful and robust results (Christie, 1987; Wooldridge, 2010). This approach enables a more detailed examination of associations between variables across different entities at a single point in time, offering insights into firm characteristics (Gujarati & Porter, 2009; Wooldridge, 2010). However, cross-sectional analysis typically requires access to large datasets that include a wide range of variables to be effective (Leuz & Wysocki, 2016). In practice, the availability of such comprehensive data is often limited – particularly in studies involving private firms and international comparisons (Atwood et al., 2012; Hope et al., 2013). This limitation restricts the scope of analysis and may affect the generalisability of findings. In future, addressing data availability issues through improved access to proprietary databases, institutional collaborations, or structured data collection initiatives would enhance the potential for more advanced empirical analysis to test the current research hypotheses.

the analysis straightforward (Stock & Watson, 2002). Given the limited amount of available data, a simple AR (1) model (which looks one year into the past) is likely the most appropriate statistical method, as it reduces the risk of overcomplicating the analysis while still capturing key patterns (Diebold, 2003).

In considering different statistical methods for my analysis, I also explored the Difference-in-Differences (DiD) approach. This method relies on several assumptions, one of which is the parallel trends assumption (Abadie, 2005; Roth et al., 2023). This assumption requires that, in the absence of treatment, the treated and control groups would have followed similar trends over time (Abadie, 2005; Roth et al., 2023). However, statistical tests conducted on my data indicated that this assumption was violated, suggesting that the DiD estimates would likely be biased and unreliable.[23] Consequently, this approach is not suitable for my research. This limits the research design employed to autoregressive models,[24] with differences considered across foreign SGE firms and non-SGE firms.[25] This approach is employed in Wells et al. (2024) and given time and data limitations no enhancements are possible at this point in time. I expect to tackle issues of additional data and more advanced statistical methods in future research.

[23] Furthermore, as highlighted by Griffin et al. (2021), an increasing number of studies emphasize the challenges and limitations of the DiD design, particularly when its core assumptions are not met (Blundell & Costa Dias, 2009; Ryan et al., 2015; Daw & Hatfield, 2018; Goodman-Bacon, 2021) or when the sample size is insufficient (Brewer et al., 2018). Griffin et al. (2021) compare the statistical performance of AR models with DiD models to assess their effectiveness in evaluating state-level policies. Compared to DiD, AR models are based on a different set of restrictive assumptions – for example, they do not require the parallel trends assumption inherent in the DiD approach – making them a viable alternative in certain research contexts. Findings from Griffin et al. (2021) demonstrate that linear AR models statistically outperform DiD models in terms of bias, root mean squared error, Type I error, and correct rejection rates. These results highlight the limitations of traditional DiD models and advocate for the use of AR models in policy evaluations (Griffin et al, 2021).

[24] Using an autoregressive model helps mitigate the issue of controlling for firm-specific factors. By estimating this model, I account for variations within each firm from year to year. Through the use of indicator variables and interaction terms, I also capture how these year-to-year differences vary between SGE and non-SGE firms. Since the model includes a lagged dependent variable, it effectively treats the firm's own past value as a control. Similarly, the model is estimated one year at a time.

[25] While the inclusion of interaction terms between firm type (foreign SGE vs non-SGE) and time periods may resemble a difference-in-differences (DiD) approach, this specification is not a formal DiD model. It does not rely on a defined treatment event or the parallel trends assumption, but instead tests whether persistence in revenue (tax, rate) differs systematically between the two groups.

The focus initially is on the MAAL which was concerned with the recognition in Australia of revenue generated in Australia. While there is evidence in Wells et al. (2024) that there was initially an increase in revenues, the question requiring address (H_1) is whether this impact reverses in subsequent years. This is evaluated with the following model:

$$Rev_{it} = \alpha_0 + \alpha_1 Rev_{it-1} + \alpha_2 Rev_{it-1} * MNC_{it} + \alpha_3 MNC_{it} + \varepsilon_{it} \quad (1)$$

This model identifies differences between current and prior year revenues and examines whether these differences vary between foreign SGE firms and non-SGE firms. Attention is usually focused on the interaction term (α_2) in these models. It is expected to identify any decline in revenues for foreign SGE firms adopting strategies to avoid MAAL. However, a challenge in this chapter is that firms classified as SGE firms would include some who may not be tax aggressive, and others that while tax aggressive, adopt the tax strategy in different years (with three years being considered). Accordingly, firms adopting the avoidance strategy in a particular year may be in the minority. In this case the impact would be captured by the indicator variable rather than the interaction, which would in turn capture the impact for the majority of firms in the period being considered (Gujarati & Porter, 2009; Wooldridge, 2010).[26]

Attention is then focused on the DPT which sought to address the transfer of profits to lower tax jurisdictions. Again, there is evidence of an initial increase in corporate tax payments in Australia (Wells et al., 2024), but whether this persists requires address (H_2). This is evaluated with the following model:

$$Tax_{it} = \beta_0 + \beta_1 Tax_{it-1} + \beta_2 Tax_{it-1} * MNC_{it} + \beta_3 MNC_{it} + \varepsilon_{it} \quad (2)$$

[26] The indicator variable reflects the average difference in outcomes between firms that are targeted by the legislation and those that are not. The interaction term, meanwhile, captures how the impact may vary depending on other factors, such as past firm behaviour. In autoregressive models interpreting interaction terms can be more complex, as the effect of one variable depends on the level of another (Gujarati & Porter, 2009; Wooldridge, 2010). When the group of tax-avoiding firms is small, the results from the interaction term often reflect patterns from the larger group of non-avoiding firms. As a result, the indicator variable becomes more important for identifying the behaviour of the minority group (Gujarati & Porter, 2009; Wooldridge, 2010).

This model identifies differences between current and prior year taxes and examines whether these differences vary between foreign SGE firms and non-SGE firms. As above, this is potentially captured by either the interaction (β_2) or the indicator variable (β_3). If there is a decrease in taxes subsequent to the initial increase in taxes associated with MAAL and DPT this would indicate that alternative strategies for CTA were developed and monetised by PwC via their taxation consulting activities for foreign SGEs.

There are challenges in determining the period over which these models are estimated. It is inappropriate to estimate them with a pooled cross section as the impact is likely concentrated in the year in which the avoidance strategy is implemented. This will be influenced by the timing of the tax advice received and challenges with the implementation of the new strategies. Estimation over multiple periods, including periods after the initial impact has occurred would significantly weaken the power of any tests (Bertrand et al., 2004; Wooldridge, 2010). At the time of conducting the analysis the corporate tax transparency data was only available for up to and including the 2019/20 financial year. Accordingly, the models are estimated annually over a three-year period after the initial application of MAAL and DPT (i.e., 2017/18, 2018/19 and 2019/20) (Angrist & Pischke, 2009; Wooldridge, 2016). To the extent that the impact is not concentrated in a single period (which cannot be observed), this reduces the power of the test. However, if responses occurred quickly, the result would be strongest in the two years following the initial application, which mitigates the problem.

The variables used in the models are defined as follows.[27]

ATO variables (Rev_{it} and Tax_{it})

The variables able to be used in the chapter are limited to the information disclosed publicly by the ATO, or those that can be calculated from this information. Tax revenue (Rev_{it})

[27] See Appendix B.2 for more detailed definitions of variables.

is disclosed by ATO and labelled 'Total Income'. Two alternative measures of Tax_{it} are considered. The first is the tax payable ($TaxPay_{it}$) and disclosed by the tax office and labelled 'Tax Payable'. The second is the rate at which taxes are payable ($Rate_{it}$), with this calculated as the tax payable ($TaxPay_{it}$) divided by tax revenue (Rev_{it}). Recognising the potential impact of size and scale effects, both of these variables are logged.

Impact variables (MNC_{it})

In evaluating responses to the legislation attention needs to be focused on targeted SGE firms. These are identified in the legislation as 'Significant Global Entities' (SGEs) and defined as firms belonging to corporate groups with global turnover in excess of $1 billion. Anecdotally the legislation targets primarily foreign SGE firms. These would generally be labelled MNCs. These firms are identified by a dichotomous variable (MNC_{it}) which assumes the value one for firms that meet the SGE criteria, and zero otherwise.

3.4 Sample and data description

3.4.1 Sample firms

Firms are identified and the necessary data is obtained from disclosures of tax return information provided by the ATO in accordance with the *Tax Laws Amendment (2013 Measures No.2) Act 2013.* These disclosures are made for public firms with turnover greater than Aud$100 million, and private companies with turnover in excess of Aud$200 million.[28] This identifies a broad sample of firms, with only some targeted (primarily foreign SGE firms) by the legislation.

[28] As of 2024 for firms above Aud$100 million.

The ATO public disclosures do not indicate whether firms are subject to the relevant legislation (i.e., an SGE). To address this, additional information is sought for firms included in the disclosures. This is obtained from a range of sources, including financial reports and a range of databases such as the Mint Global, Orbis, IBISWorld, and Connect4 databases. This forms the basis for determining whether firms are foreign SGE firms or non-SGE firms, and this is captured by the indicator variable MNC.

The process of identifying whether firms are subject to the legislation also facilitates the determination of necessary exclusions. First, investment entities are specifically excluded from the application of the legislation (e.g., managed investment trusts, foreign collection investment vehicles with wide membership, foreign entities owned by a foreign government, complying superannuation entities and foreign pension funds). Hence, these entities are excluded from the sample. Second, it identifies Australian firms meeting the SGE definition. These are overwhelmingly publicly listed firms paying dividends and for these firms the costs of corporate tax payments are ameliorated by dividend imputation (McClure et al., 2018). For these firms there is little evidence of CTA (McClure et al., 2018). Accordingly, while these firms are ostensibly subject to the legislation, they are unlikely to be the intended targets as per the hypotheses of this research. Australian SGE firms are unlikely to be tax aggressive, and the impact of the MAAL and DPT legislation, as well as the PwC scandal, on the CTA on these firms is beyond the scope of this study (McClure et al., 2018). Prior research studies emphasize that including irrelevant or low-variance observations in a sample can weaken estimation efficiency, increase variance, and obscure true effects, ultimately reducing statistical power (Verbeek, 2012; Wooldridge, 2010). Therefore, I exclude Australian SGE firms from my sample for theoretical reasons (as discussed in the hypotheses section). Including Australian SGE firms in the empirical analysis could therefore significantly reduce the overall power of the research design (Heckman, 1979; Verbeek, 2012). Furthermore, the methodological

literature highlights that selecting observations only theoretically relevant to the research objective enhances the internal validity of the research by minimizing noise and improving the interpretability of results (Hulley et al., 2013; Patino & Ferreira, 2018). Including foreign SGE firms in the sample is relevant to the specific behaviours under investigation, consistent with Patino and Ferreira (2018) and Hulley et al. (2013). This decision helps maintain analytical focus and improve estimation accuracy without compromising the generalizability of the findings (Heckman, 1979; Wooldridge, 2010).[29]

3.4.2 Data description and descriptive statistics

The sample comprises 1,612 firms for the 2017/18 year, with data available for both years to evaluate the impact of MAAL. Details of these firms are provided in Table 3.1, Panel A. It is notable that 197 firms are not included in this sample because they appeared on the ATO disclosure list in the 2016/17 year but disappeared from the list in the 2017/18 year. These are arguably the firms most likely impacted by obfuscation of the MAAL based on the advice provided by PwC, as their revenues dropped below threshold amount in 2017/18 year. Rather than excluding these firms completely, additional analysis is undertaken by including them in the sample assuming that the firm's revenue in the current year equals the threshold amount. This is a conservative estimate as the actual decrease in revenue would necessarily be greater.

[29] The challenge with Australian SGEs is that, technically, the legislation applies to them as well. However, my primary concern is that while these firms are subject to the same regulatory framework, they are not expected to engage in the type of tax minimization strategies that the legislation aims to constrain – such as those associated with PwC-advised tax schemes. As a result, keeping Australian SGEs in the sample may not offer a meaningful comparison, since their tax behaviour is unlikely to have changed significantly in response to the legislation. Moreover, including these firms could introduce additional complexity and noise into the analysis, potentially weakening the ability to isolate the legislation's impact on firms that were more likely to be affected (Verbeek, 2012; Wooldridge, 2010). The purpose of this research is to evaluate how the regulatory changes influenced tax strategies among firms with clear incentives to engage in aggressive tax planning. Including firms that were unlikely to pursue such strategies could dilute the results and reduce the precision of the estimated effects. Therefore, excluding Australian SGEs is a more methodologically sound decision. It ensures that the analysis remains focused on firms for whom the legislation was expected to drive behavioural change. This targeted approach helps draw a clearer distinction between affected and unaffected firms, reduces the risk of confounding influences, and strengthens the overall robustness of the research conclusions (Heckman, 1979; Wooldridge, 2010).

Accordingly, analysis of the impact of MAAL is also undertaken based on this enlarged sample of 1,809 firms (for 2017/18 year). A similar analysis is undertaken for the years 2018/19 and 2019/20 (Table 3.1, Panels B and C).

Table 3.1

Sample Firms – Revenues

Sample firms identified from tax return disclosures provided by the ATO annually. SGE - Significant Global Entity (as defined by the ATO); Non-SGE - entity that does not meet the ATO definition of a Significant Global Entity.

Panel A: 2017/18 firm years with all revenue data available.

	All revenue data		Revenue data + Threshold	
	Number	%	Number	%
Australian				
• Non-SGE	660	40.94%	759	41.96%
Foreign				
• SGE	754	46.77%	830	45.88%
• Non-SGE	198	12.28%	220	12.16%
Total	1,612	100.00%	1,809	100.00%

Panel B: 2018/19 firm years with all revenue data available.

	All revenue data		Revenue data + Threshold	
	Number	%	Number	%
Australian				
• Non-SGE	719	42.24%	820	43.20%
Foreign				
• SGE	761	44.71%	829	43.68%
• Non-SGE	222	13.04%	249	13.12%
Total	1,702	100.00%	1,898	100.00%

Panel C: 2019/20 firm years with all revenue data available.

	All revenue data		Revenue data + Threshold	
	Number	%	Number	%
Australian				
• Non-SGE	774	43.58%	910	45.23%
Foreign				
• SGE	780	43.92%	841	41.80%
• Non-SGE	222	12.50%	261	12.97%
Total	1,776	100.00%	2,012	100.00%

The ATO disclosures are limited to the three items as indicated previously. For example, the legislation prescribes the disclosure of tax profits, but this does not include tax losses. Accordingly, for evaluation of the impact of DPT a process similar to the above is followed.

However, there is an additional problem in that firms targeted by the legislation frequently recognise tax losses prior to the DPT and the omission of these firms is necessary as the data is unavailable. The result is a much-reduced sample of 988 firms (for 2017/18 year). Details of these firms are provided in Table 3.2, Panel A. The same analysis is undertaken for the years 2018/19 and 2019/20 (Table 3.2, Panels B and C).

Table 3.2

Sample Firms – Taxes

Sample firms identified from tax return disclosures provided by the ATO annually. SGE - Significant Global Entity (as defined by the ATO); Non-SGE - entity that does not meet the ATO definition of a Significant Global Entity.

Panel A: 2017/18 firm years with taxes all data available		
	Number	%
Australian		
• Non-SGE	410	41.50%
Foreign		
• SGE	460	46.56%
• Non-SGE	118	11.94%
Total	988	100%

Panel B: 2018/19 firm years with taxes all data available		
	Number	%
Australian		
• Non-SGE	445	42.50%
Foreign		
• SGE	472	45.08%
• Non-SGE	130	12.42%
Total	1,047	100.00%

Panel C: 2019/20 firm years with taxes all data available		
	Number	%
Australian		
• Non-SGE	458	41.94%
Foreign		
• SGE	500	45.79%
• Non-SGE	134	12.27%
Total	1,092	

Descriptive statistics for sample firm years are provided in Table 3.3 and Table 3.4.[30] The impact of the criteria for inclusion in the sample, and the impact of some large SGE firms is evident with mean (median) revenues of AUD$582m (AUD$298m) for 2017/18 year (Table 3.3, Panel A). However, tax payable is much more modest with mean (median) tax payable of only AUD$16.6m (AUD$5.956m) for 2017/18 year (Table 3.4, Panel A). To mitigate the potential impact of extreme values the following analysis is undertaken using logged variables.

[30] Additional descriptive statistics and t-tests comparing SGE and non-SGE firms are reported in Appendix B.3. These include mean values of Revenue, Taxes Payable, and Tax Rate; t-tests of changes in these variables between periods; and comparisons of those changes across SGE and non-SGE firms. Results are presented for both raw and log-transformed measures of the dependent variables. The findings are consistent with the subsequent regression analysis and provide complementary evidence regarding differences between SGE and non-SGE firms.

Table 3.3

Descriptive Statistics – Revenues

Panel A1: 2017/18 firm years with all revenue data available.					
	Mean	Std Dev	25th Percent	Median	75th Percent
Rev_{it}	582,000,000	1,100,000,000	189,000,000	298,000,000	543,000,000
Rev_{it-1}	536,000,000	1,020,000,000	173,000,000	269,000,000	498,000,000

Panel A2: 2017/18 firm years with all revenue data available, plus firms where current year figures are not disclosed and disclosure thresholds are substituted					
	Mean	Std Dev	25th Percent	Median	75th Percent
Rev_{it}	530,000,000	1,050,000,000	148,000,000	268,000,000	497,000,000
Rev_{it-1}	505,000,000	967,000,000	162,000,000	258,000,000	471,000,000

Panel B1: 2018/19 firm years with all revenue data available.					
	Mean	Std Dev	25th Percent	Median	75th Percent
Rev_{it}	603,000,000	1,240,000,000	192,000,000	305,000,000	565,000,000
Rev_{it-1}	559,000,000	1,080,000,000	180,000,000	285,000,000	520,000,000

Panel B2: 2018/19 firm years with all revenue data available, plus firms where current year figures are not disclosed and disclosure thresholds are substituted					
	Mean	Std Dev	25th Percent	Median	75th Percent
Rev_{it}	551,000,000	1,180,000,000	154,000,000	276,000,000	516,000,000
Rev_{it-1}	533,000,000	1,030,000,000	168,000,000	272,000,000	495,000,000

Panel C1: 2019/20 firm years with all revenue data available.					
	Mean	Std Dev	25th Percent	Median	75th Percent
Rev_{it}	616,000,000	1,310,000,000	189,000,000	298,000,000	570,000,000
Rev_{it-1}	590,000,000	1,220,000,000	186,000,000	296,000,000	547,000,000

Panel C2: 2019/20 firm years with all revenue data available, plus firms where current year figures are not disclosed and disclosure thresholds are substituted					
	Mean	Std Dev	25th Percent	Median	75th Percent
Rev_{it}	556,000,000	1,240,000,000	147,000,000	264,000,000	514,000,000
Rev_{it-1}	549,000,000	1,160,000,000	173,000,000	277,000,000	505,000,000

All variables are defined in Appendix B.2

Table 3.4

Descriptive Statistics – Taxes

Panel A1: 2017/18 firm years with all data available.					
	Mean	Std Dev	25th Percent	Median	75th Percent
$TaxPay_{it}$	16,600,000	48,300,000	2,379,189	5,956,387	13,200,000
$TaxPay_{it-1}$	13,000,000	32,300,000	1,993,894	4,952,801	12,000,000
$Rate_{it}$	0.0280	0.0307	0.0091	0.0185	0.0347
$Rate_{it-1}$	0.0256	0.0280	0.0080	0.0177	0.0317

Panel B1: 2018/19 firm years with all data available.					
	Mean	Std Dev	25th Percent	Median	75th Percent
$TaxPay_{it}$	17,600,000	59,900,000	2,271,809	5,723,814	12,800,000
$TaxPay_{it-1}$	16,200,000	47,900,000	2,247,245	5,521,188	12,700,000
$Rate_{it}$	0.0262	0.0288	0.0087	0.0166	0.0327
$Rate_{it-1}$	0.0275	0.0300	0.0089	0.0183	0.0343

Panel C1: 2019/20 firm years with all data available.					
	Mean	Std Dev	25th Percent	Median	75th Percent
$TaxPay_{it}$	16,800,000	48,200,000	2,051,595	5,377,405	13,200,000
$TaxPay_{it-1}$	17,300,000	58,800,000	2,213,394	5,529,008	12,800,000
$Rate_{it}$	0.0263	0.0329	0.0080	0.0158	0.0315
$Rate_{it-1}$	0.0267	0.0307	0.0085	0.0166	0.0326

All variables are defined in Appendix B.2

3.5 Results

Attention is first focused on whether the increases in revenue initially observed diminished in subsequent periods to test hypothesis 1. This is addressed by model 1 and for firms where information from the ATO disclosures is available for both the current year and the prior year the results are presented in Table 3.5.

Table 3.5.

Impact of avoidance strategies on revenue recognition

Evaluation of the impact of the avoidance strategies through changes in annual revenues recognised by MNCs in Australia. This is undertaken for firms where data is available from the ATO disclosures in both the current year and the prior year. (Revenues logged)

Panel A: Change from 2016/17 to 2017/18			
	Co-eff.	t-stat.	
Constant	1.942	5.85	***
Rev_{it-1}	0.904	52.60	***
$Rev_{it-1} * MNC_{it}^{17/18}$	0.069	3.50	***
$MNC_{it}^{17/18}$	-1.326	-3.48	***
N	1,612		
Adjusted R^2	0.912		

Panel B: Change from 2017/18 to 2018/19			
	Co-eff.	t-stat.	
Constant	1.737	5.74	***
Rev_{it-1}	0.914	58.46	***
$Rev_{it-1} * MNC_{it}^{18/19}$	0.045	2.38	**
$MNC_{it}^{18/19}$	-0.850	-2.28	***
N	1,702		
Adjusted R^2	0.898		

Panel C: Change from 2018/19 to 2019/20			
	Co-eff.	t-stat.	
Constant	1.639	5.71	***
Rev_{it-1}	0.917	62.01	***
$Rev_{it-1} * MNC_{it}^{19/20}$	0.056	3.27	***
$MNC_{it}^{19/20}$	-1.102	-3.28	***
N	1,776		
Adjusted R^2	0.896		

Asterisks ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

All variables are defined in Appendix B.2. This table reports coefficients of the following model:

$$Rev_{it} = \alpha_0 + \alpha_1 Rev_{it-1} + \alpha_2 Rev_{it-1} * MNC_{it} + \alpha_3 MNC_{it} + \varepsilon_{it} \quad (1)$$

In Panel A consideration is given to the change between 2016/17 and 2017/18. It is notable that the co-efficient on lagged revenue is almost one (α_1=0.904, t-stat=52.60) which suggests that for non-SGE firms there is little evidence of change in subsequent years. This contrasts sharply with the results for foreign SGE firms. The co-efficient on the interaction term is positive and significant (α_2=0.069, t-stat=3.50) while the co-efficient on the indicator variable is negative and significant (α_3=-1.326, t-stat=-3.48). These results suggest that while some foreign SGE firms report relatively higher revenues than non-SGE firms (i.e., the interaction) others report significantly less revenues than non-SGE firms. Arguably, this result is expected given the time necessary for the diffusion and implementation of a tax strategy that avoided revenue recognition in Australia and is consistent with hypothesis 1.[31]

The results for changes in revenues between 2017/18 and 2018/19 are presented in Panel B. The co-efficient on lagged revenue is close to one (α_1=0.914, t-stat=58.46) and this identifies little change in tax revenues for non-SGE firms. The co-efficient on the interaction term is positive and significant (α_2=0.045, t-stat=2.38) and the co-efficient on the indicator variable is negative and significant (α_3=-0.850, t-stat=-2.28). These results are consistent with those reported in Panel A and suggest a progressive diffusion of the tax strategy across foreign SGE firms.

The results for changes between 2018/19 and 2019/20 are presented in Panel C. The co-efficient on lagged revenue is close to one (α_1=0.917, t-stat=62.01) again suggesting a small change in tax revenues for non-SGE firms. The co-efficient on the interaction term is positive and significant (α_2=0.056, t-stat=3.27) while the co-efficient on the indicator variable is

[31] Future research with additional hand collected data and using cross-sectional analysis has the ability to generate statistically more powerful and robust results with respect to hypothesis 1 (Christie, 1987; Wooldridge, 2010). It would enable a more detailed examination of associations between variables across different entities at a single point in time, offering insights into firm characteristics (Gujarati & Porter, 2009; Wooldridge, 2010). Current scope of analysis is restricted as discussed earlier and may affect the generalisability of the findings. In future, addressing data availability issues through improved access to proprietary databases, institutional collaborations, or structured data collection initiatives would enhance the potential for more advanced empirical analysis to test the current research hypotheses.

negative and significant (α_3=-1.102, t-stat=-3.28). These results are consistent with those reported in Panel A and arguably indicate a progressive diffusion of the tax strategy across foreign SGE firms.

A limitation above is that sample firms are restricted to those where revenue information is available for both the current year and the prior year. This is problematic as a tax strategy aimed at avoiding the requirement to recognise revenue in Australia would potentially see the firm excluded from the sample. To address this issue, where data is unavailable, the value of the ATO disclosure threshold is assumed for the missing period. The results for this expanded sample are presented in Table 3.6.

In Panel A consideration is given to the change between 2016/17 and 2017/18. It is notable that the co-efficient on lagged revenue is near one (α_1=0.883, t-stat=35.14) which potentially indicates that for non-SGE firms there is little evidence of change in subsequent years. This contrasts sharply with the results for foreign SGE firms. The co-efficient on the interaction term is positive and significant (α_2=0.095, t-stat=3.33) while the co-efficient on the indicator variable is negative and significant (α_3=-1.809, t-stat=-3.30). These results suggest that while some foreign SGE firms report relatively higher revenues than non-SGE firms (i.e., the interaction), others report significantly less revenue than non-SGE firms. Again, this result is seemingly expected given the time necessary for the diffusion and implementation of a tax strategy that avoids revenue recognition in Australia. However, it is notable that these results are likely more pronounced than for the full sample.

The results for changes in revenues between 2017/18 and 2018/19 are presented in Panel B. The co-efficient on lagged revenue is again little different from one (α_1=0.916, t-stat=46.81) and this identifies little change in tax revenues for non-SGE firms. The co-efficient on the interaction term is positive and insignificant (α_2=0.013, t-stat=0.050) and the co-efficient on the indicator variable is also negative and insignificant (α_3=-0.213, t-stat=-0.42).

Table 3.6

Impact of avoidance strategies on revenue recognition (extended sample)

Evaluation of the impact of the avoidance strategies through changes in annual revenues recognised by MNCs in Australia. This is undertaken for firms where data is available from the ATO disclosures, as well as for firms ceasing to release data in the current period with this assumed to be the threshold for disclosure. (Revenues logged)

Panel A: Change from 2016/17 to 2017/18			
	Co-eff.	t-stat.	
Constant	2.253	4.68	***
Rev_{it-1}	0.883	35.14	***
$Rev_{it-1} * MNC_{it}^{17/18}$	0.095	3.33	***
$MNC_{it}^{17/18}$	-1.809	-3.30	***
N	1,809		
Adjusted R^2	0.809		

Panel B: Change from 2017/18 to 2018/19			
	Co-eff.	t-stat.	
Constant	1.596	4.25	***
Rev_{it-1}	0.916	46.81	***
$Rev_{it-1} * MNC_{it}^{18/19}$	0.013	0.050	
$MNC_{it}^{18/19}$	-0.213	-0.42	
N	1,898		
Adjusted R^2	0.775		

Panel C: Change from 2018/19 to 2019/20			
	Co-eff.	t-stat.	
Constant	1.433	3.69	***
Rev_{it-1}	0.923	45.66	***
$Rev_{it-1} * MNC_{it}^{19/20}$	0.052	2.20	**
$MNC_{it}^{19/20}$	-0.974	-2.11	**
N	2012		
Adjusted R^2	0.819		

Asterisks ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

All variables are defined in Appendix B.2. This table reports coefficients of the following model:

$$Rev_{it} = \alpha_0 + \alpha_1 Rev_{it-1} + \alpha_2 Rev_{it-1} * MNC_{it} + \alpha_3 MNC_{it} + \varepsilon_{it} \quad (1)$$

Finally, the results for changes between 2018/19 and 2019/20 are presented in Panel C. The co-efficient on lagged revenue is close to one (α_1=0.923, t-stat=45.66) suggesting little change in tax revenues for non-SGE firms. The co-efficient on the interaction term is positive and significant (α_2=0.052, t-stat=2.20) while the co-efficient on the indicator variable is negative and significant (α_3=-0.974, t-stat=-2.11). These results are consistent with those reported in Panel A and potentially indicate a progressive diffusion of the tax strategy across foreign SGE firms.

Within the limitations of the current analysis as discussed in Section 3.3 the overall results here suggest that in the year after the passage of MAAL new tax minimization schemes, potentially related to the PwC tax scandal, to avoid revenue recognition in Australia, of revenue generated in Australia, were used by some foreign SGE firms. Further, this seemingly became more commonplace in subsequent years. It is notable that the impact is demonstrated by significantly lower revenues for foreign SGE firms (i.e., indicator variable), rather than the interaction term, but this is potentially a consequence of differences in the timing of adopting strategies to avoid the tax. For firms not adopting the strategy in the current period this is deterministic of the co-efficient on the interaction. To the extent avoidance strategies result in disproportionately large declines in revenues, this is deterministic of the co-efficient on the indicator variable. It is the equivalent of partitioning the sample of foreign SGE firms into those adopting an avoidance strategy in the current period and those that do not. A challenge in further evaluating this result is the inability to determine (as the data are unavailable) when tax avoidance first occurred with individual firms, thus reducing the power of the analysis.[32]

[32] Current scope of analysis is restricted as discussed earlier and may affect the generalisability of the results. Future research with additional hand collected data and using cross-sectional analysis has the ability to generate statistically more powerful and robust results with respect to hypothesis 1 (Christie, 1987; Wooldridge, 2010). It would enable a more detailed examination of associations between variables across different entities at a single point in time, offering insights into firm characteristics (Gujarati & Porter, 2009; Wooldridge, 2010).

Attention is then shifted to whether the impact on corporate tax payments persists in subsequent periods to test hypothesis 2. The results for taxes payable are shown in Table 3.7.

Table 3.7 Impact of avoidance strategies on taxes payable.

Evaluation of the impact of the avoidance strategies through changes in annual taxes payable by MNCs in Australia. This is undertaken for firms where data is available from the ATO disclosures. (Taxes payable logged)

Panel A: Change from 2016/17 to 2017/18			
	Co-eff.	t-stat.	
Constant	2.483	3.48	***
$TaxPay_{it-1}$	0.846	18.51	***
$TaxPay_{it-1} * MNC_{it}^{17/18}$	-0.169	-1.70	*
$MNC_{it}^{17/18}$	2.775	1.75	*
N	988		
Adjusted R^2	0.579		

Panel B: Change from 2017/18 to 2018/19			
	Co-eff.	t-stat.	
Constant	2.820	23.40	***
$TaxPay_{it-1}$	0.814	18.01	***
$TaxPay_{it-1} * MNC_{it}^{18/19}$	-0.034	-0.56	
$MNC_{it}^{18/19}$	0.699	0.72	
N	1047		
Adjusted R^2	0.673		

Panel C: Change from 2018/19 to 2019/20			
	Co-eff.	t-stat.	
Constant	3.235	4.50	***
$TaxPay_{it-1}$	0.788	17.00	***
$TaxPay_{it-1} * MNC_{it}^{19/20}$	0.510	0.92	
$MNC_{it}^{19/20}$	-0.766	-0.87	
N	1092		
Adjusted R^2	0.635		

Asterisks ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

All variables are defined in Appendix B.2. This table reports coefficients of the following model:

$$Tax_{it} = \beta_0 + \beta_1 Tax_{it-1} + \beta_2 Tax_{it-1} * MNC_{it} + \beta_3 MNC_{it} + \varepsilon_{it} \quad (2)$$

In Panel A consideration is given to the change between 2016/17 and 2017/18. It is notable that the co-efficient on lagged tax payable is close to one (β_1=0.846, t-stat=18.51) suggesting that for non-SGE firms there is little evidence of change in subsequent years. However, the co-efficient on the interaction is negative and significant (β_2=-0.169, t-stat=-1.70) and the co-efficient on the indicator variable is positive and significant (β_3=2.775, t-stat=1.75) potentially indicating that some foreign SGE firms, (perhaps those advised by PwC) who utilised new CTA strategies paid lower taxes. This provides evidence in support of hypothesis 2.[33]

In Panel B consideration is given to the change between 2017/18 and 2018/19. It is notable that the co-efficient on lagged tax payable is near one (β_1=0.814, t-stat=18.01) suggesting that for non-SGE firms there is little evidence of change in subsequent years. The co-efficient on the interaction is negative and insignificant (β_2=-0.034, t-stat=-0.56) and the co-efficient on the indicator variable is positive and insignificant (β_3=0.699, t-stat=0.72) providing little evidence in support of hypothesis 2.

In Panel C consideration is given to the change between 2018/19 and 2019/20. It is notable that the co-efficient on lagged tax payable is close to one (β_1=0.788, t-stat=17.00) which suggests that for non-SGE firms there is little evidence of change in subsequent years. However, the co-efficient on the interaction is positive and insignificant (β_2=0.510, t-stat=0.92) and the co-efficient on the indicator variable is negative and insignificant (β_3=-0.766, t-stat=-0.87). These results are supportive, at least initially, of a decline in tax payments by foreign SGE firms and therefore hypothesis 2. There is little evidence of this in subsequent years. One

[33] Future analysis with additional hand collected data and using cross-sectional analysis has the ability to generate statistically more powerful and robust results with respect to hypothesis 2 (Christie, 1987; Wooldridge, 2010). It would enable a more detailed examination of associations between variables across different entities at a single point in time offering insights into firm characteristics (Gujarati & Porter, 2009; Wooldridge, 2010). Current scope of analysis is restricted as discussed earlier and may affect the generalisability of findings.

possible explanation is due to the proportion of firms adopting an aggressive strategy in the first year compared to the second and third years of the three-year period.

Consideration is then shifted to the changes in the incidence of tax, measured by *Rate,* with the results presented in Table 3.8. However, caution is needed as the denominator in the variable *Rate* is *Revenue*, and there is evidence in Tables 3.5 and 3.6 of a decline in the recognition of revenues in Australia by foreign SGE firms. This potentially confounds the results if the decline in revenues is greater than the decline in tax payable.

In Panel A consideration is given to the change between 2016/17 and 2017/18. It is notable that the co-efficient on *Rate* is close to one (β_1=0.868, t-stat=28.95) which suggests that for non-SGE firms there is little evidence of change in subsequent years. The co-efficient on the interaction was positive and significant (β_2=0.105, t-stat=1.68) and the co-efficient on the indicator variable is negative and insignificant (β_3=-0.002, t-stat=-1.56).

In Panel B consideration is given to the change between 2017/18 and 2018/19. The co-efficient on *Rate* is near one (β_1=0.890, t-stat=23.40) suggesting that for non-SGE firms there is little evidence of change in subsequent years. The co-efficient on the interaction is negative and insignificant (β_2=-0.224, t-stat=-1.61) and the co-efficient on the indicator variable is positive and significant (β_3=0.006, t-stat=1.73).

Finally, in Panel C consideration is given to the change between 2018/19 and 2019/20. It is notable that the co-efficient on *Rate* is close to one (β_1=0.962, t-stat=21.94) suggesting that for non-SGE firms there is little evidence of a change in subsequent years. Notably, the co-efficient on the interaction is negative and significant (β_2=-0.163, t-stat=-2.28) and the co-efficient on the indicator variable is positive and insignificant (β_3=0.002, t-stat=1.61).

Table 3.8

Impact of avoidance strategies on tax rates.

Evaluation of the impact of the avoidance strategies through changes in annual tax rates for MNCs in Australia. This is undertaken for firms where data is available from the ATO disclosures.

Panel A: Change from 2016/17 to 2017/18			
	Co-eff.	t-stat.	
Constant	0.005	6.51	***
$Rate_{it-1}$	0.868	28.95	***
$Rate_{it-1} * MNC_{it}^{17/18}$	0.105	1.68	*
$MNC_{it}^{17/18}$	-0.002	-1.56	
N	988		
R^2	0.69		

Panel B: Change from 2017/18 to 2018/19			
	Co-eff.	t-stat.	
Constant	0.002	2.21	**
$Rate_{it-1}$	0.890	23.40	***
$Rate_{it-1} * MNC_{it}^{18/19}$	-0.224	-1.61	
$MNC_{it}^{18/19}$	0.006	1.73	*
N	1047		
Adjusted R^2	0.688		

Panel C: Change from 2018/19 to 2019/20			
	Co-eff.	t-stat.	
Constant	0.001	1.60	
$Rate_{it-1}$	0.962	21.94	***
$Rate_{it-1} * MNC_{it}^{19/20}$	-0.163	-2.28	**
$MNC_{it}^{19/20}$	0.002	1.61	
N	1092		
Adjusted R^2	0.714		

Asterisks ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

All variables are defined in Appendix B.2. This table reports coefficients of the following model:

$$Tax_{it} = \beta_0 + \beta_1 Tax_{it-1} + \beta_2 Tax_{it-1} * MNC_{it} + \beta_3 MNC_{it} + \varepsilon_{it} \quad (2)$$

In combination these results demonstrate that there are changes in corporate tax payments (i.e., *TaxPay* and *Rate*) in the years after the passage of the legislation. This is demonstrated by a combination of significant differences in the tax payable and the proportion of tax payable relative to tax revenues. However, there are a few challenges in evaluating these impacts. It is impossible to determine the year in which a tax avoidance strategy is first employed as there is no public data available, which weakens the power of the tests. There are also issues with the determination of the tax rate if the tax avoidance strategy involved the (non) recognition of revenues in Australia. If this occurs, then the change in the ratio may be greatly influenced by change in the denominator rather than the numerator. This would create measurement error in the variable and weaken the power of tests. Additional hand collected data, which will enable the use of more powerful cross-sectional analysis, is necessary to resolve these issues and provide additional support for hypotheses 1 and 2 (Christie, 1987; Wooldridge, 2010). It would enable a more detailed examination of associations between variables across different entities at a single point in time, offering insights into firm characteristics (Gujarati & Porter, 2009; Wooldridge, 2010).[34]

3.6 Conclusion

The objective of this chapter is to evaluate the persistence (beyond that of Wells et al., 2024 specifically) of unilateral legislative strategies to constrain CTA (MAAL and DPT) against the background of the PwC tax scandal. Australia is in a unique position here, whereby the scandal is an extreme example that despite MAAL and DPT the incentive for CTA by the MNCs persists, suggesting that unilateral legislative strategies merely constrain CTA which at best increases the costs thereof. Further, Australia is one of few countries (perhaps the only

[34] The scope of the current study is restricted as discussed earlier and may affect the generalisability of the findings.

country) that has enacted multiple unilateral anti-avoidance legislative initiatives in the last 10 years and requires the disclosure, by the ATO, of tax return data and that those initiatives had the objective to ultimately increase the tax payable in Australia by MNCs.

While there was an increase in tax revenues recognised in Australia by foreign SGE firms immediately after the passage of the legislation (Wells et al., 2024) there is evidence in this chapter that this declines in subsequent years. One possible explanation is that the CTA strategy associated with the PwC tax scandal involved new schemes to recognise revenues in jurisdictions outside Australia in order to circumvent MAAL. Overall, this provides support for hypothesis 1 and is consistent with anecdotal evidence from tax professionals, albeit unreported.

There is also evidence provided in this chapter that while taxes paid by foreign SGE firms increased immediately after the passage of the legislation (Wells et al., 2024) this declined in the subsequent year providing initial support for hypotheses 2. The results for 3 and 4 years after the legislation provide little evidence of a decline in taxes paid by foreign SGE firms and therefore the overall support for hypothesis 2 is mixed.

In combination these results suggest that the unilateral strategies in Australia to constrain CTA are seemingly and relatively short lived. These results, within the data and statistical limitations, make a number of important contributions to the literature and practice. The public revelations of the PwC tax scandal in 2023 are evidence alone that despite some of the most comprehensive unilateral anti-avoidance legislative strategies, their success is likely to be temporary at best. This aligns with the common view in practice that the tax consultants and MNCs are always a step ahead of tax authorities with respect to tax avoidance schemes. In Australia, the conflict of interest with respect to the PwC tax scandal seems to have contributed to the (speed of) development of strategies to circumvent MAAL and DPT one year after their effective date. Thus, policy makers will need to consider factors in implementing new unilateral

anti-avoidance legislative strategies in order to improve their resilience over time. For example, limit the involvement of the profession in drafting the legislation and strengthening conflict of interest rules. In fact, this process is well under way in Australia (Chalmers, 2023). More importantly, policy makers will need to recognise that unilateral anti-avoidance legislative strategies at best only constrain CTA by increasing the costs thereof and that eventually MNCs will find new ways to circumvent the legislation. Thus, the costs of CTA have to be increased significantly but at the same time policy makers should also provide for legislative changes resulting in the lowering of incentives for CTA (for example, such as the dividend imputation regime in Australia). Only then will CTA decline permanently (McClure et al., 2018).

Additionally, the results here provide insights that are more broadly applicable to all types of anti-avoidance legislative strategies. More specifically, the conflict of interest arising from the involvement of PwC in the development of the legislation and its subsequent promotion of strategies to avoid MAAL and DPT, is of broader concern as well, as these conflicts are little different from the involvement of countries facilitating CTA in the development of multilateral strategies. At the multilateral anti-avoidance legislative strategies level there are even more concerns given little to no action taken, at least until the last few years in the form of the Global Minimum Tax initiative which has been legislated for in Australia (ATO, 2024c; Ravlic, 2024).

There are important limitations with respect to the research design and thus the results in this chapter. First relates to the ATO data which is limited to three tax return variables preventing the application of a more rigorous research design. Expansion of the data provided by the ATO would enable a more precise evaluation of CTA. In particular, the disclosure of current and carried forward taxable losses and whether entities in the ATO disclosure list are subject to the anti-avoidance legislation (i.e., SGE firms). The inability to integrate ATO data with data obtained from other sources is also a limitation that prevents cross-sectional analysis

of CTA. If corporate filings with the Australian Securities and Investments Commission are made readily available (i.e., not pay per view) and in a machine-readable format (i.e., digital financial reporting) it would better enable the determination of when a tax avoidance strategy was first employed, and this would also provide for significantly more rigorous statistical testing. Additionally, due to these data limitations, the research design adopted an autoregressive model. While this approach is appropriate in the present context, given the time-series nature of the data, it has certain limitations – particularly regarding the generalisability of the findings and, depending on the sample size and structure, potentially reduced statistical power when compared to cross-sectional analysis.

Future research should consider new data (since that used here) disclosed by the ATO to further test the persistence of MAAL and DPT to decrease CTA. Especially since 2023 in order to see the impact of the many government enquiries and investigations into the PwC tax scandal, the aim of which, as was stated earlier, was to ensure the integrity of the Australian tax system and presumably to allow MAAL and DPT to resume working as intended. Additionally, the ATO tax transparency data should be matched with financial reporting data for as many firms as possible to enable the collection of cross-sectional data to provide for more powerful testing of the hypotheses. For example, it would support cross-sectional studies examining how firm-specific characteristics – such as size, profitability, capital structure, and industry – relate to effective tax rates or aggressive tax planning. Furthermore, if data over multiple years are available, panel data models could be employed to control for unobserved firm-specific effects and capture within-firm variation over time. In cases where relevant tax policy changes occur, difference-in-differences approaches could be used to assess their causal impact on firm behaviour. Together, these statistical methods would significantly enhance the analytical depth, robustness, and generalisability of the findings, contributing to a more nuanced understanding of the impact of the PwC scandal on CTA. Finally, starting in 2024/25

new tax data should be disclosed by MNCs in Australia in line with the proposed country-by-country tax reporting regime (MinterEllison, 2024) which could also provide for a more precise evaluation of MNCs CTA activities and thus for more rigorous research designs.

Appendix B

Appendix B.1 PwC tax scandal history timeline[35]

Dec-2013	Peter Collins signs first confidentiality agreement
Apr-2015	Peter Collins and Tom Seymour appear at a public hearing for the Senate inquiry into corporate tax avoidance
Jan-2016	Commencement of the Multinational Anti-Avoidance Law (MAAL)
Apr-2016	ATO becomes aware of companies avoiding the MAAL
Mar-2018	ATO shares information with AFP
Mar-2019	AFP and ATO consider there is not sufficient evidence to pursue a formal investigation
Jul-2020	ATO refers Peter Collins to the Tax Practitioners Board (TPB)
Jan-2021	TPB commenced its investigation into Peter Collins
Mar-2021	TPB commenced its investigation into PwC
Dec-2022	TPB updated its Public Register with findings and sanction decisions on PwC and Peter Collins
Jan-2023	Australian Financial Review reveals former PwC partner Peter Collins has been deregistered for two years for leaking government tax information
Mar-2023	Senate refers inquiry into the management and assurance of integrity by consulting services to the Senate Finance and Public Administration References Committee
May-2023	144 pages of emails uncovered by the inquiry were published by Australian Labor Party Senator Deborah O'Neill. Seymore steps down as CEO, 9 PwC partners stood down, Treasury refers case to AFP
Aug-2023	Package of reforms announced by government
Oct-2023	ASIC bans Peter Collins from providing financial services for eight years
May-2024	Release of the Treasury Laws Amendment (Tax Accountability and Fairness) Bill 2023
Nov-2024	AFP raids on PwC Offices Release of the Final Report of the Parliamentary Joint Committee on Corporations and Financial Services Inquiry into Ethics and Professional Accountability

[35] For more information see Chenoweth & Tadros (2023), Ainsworth (2023), Chenoweth (2023), Chalmers (2023), Kruger (2024), Tadros (2024).

Appendix B.2 Definitions of variables

Definitions of variables used in the chapter*

ATO variables	
Rev_{it}	Tax revenue variable that is obtained from the information released by the ATO and labelled 'Total Income' for firm *i* in year t.
Rev_{it-1}	Tax revenue variable that is obtained from the information released by the ATO and labelled 'Total Income' for firm *i* in year t-1.
$TaxPay_{it}$	Tax payable variable that is obtained from the information released by the ATO and labelled 'Tax Payable' for firm *i* in year t.
$TaxPay_{it-1}$	Tax payable variable that is obtained from the information released by the ATO and labelled 'Tax Payable' for firm *i* in year t-1.
$Rate_{it}$	The rate at which taxes are payable which is calculated as the tax payable ($TaxPay_{it}$) divided by tax revenue (Rev_{it}) for firm *i* in year t.
$Rate_{it-1}$	The rate at which taxes are payable which is calculated as the tax payable ($TaxPay_{it-1}$) divided by tax revenue (Rev_{it-1}) for firm i in year t-1.
Impact variable	
MNC_{it}	A dichotomous variable which assumes the value one for firm *i* in year t that meet the SGE criteria, and zero otherwise.

* Variables Rev_{it}, Rev_{it-1}, $TaxPay_{it}$, $TaxPay_{it-1}$ are logged.

Appendix B.3 Descriptive statistics and t-tests for change in revenues, taxes payable, and tax rate for SGE and non-SGE firms

Appendix B3.1 Descriptive statistics: revenues for SGE and non-SGE firms

Panel A: 2017/18 firm years with all data available

	n	Mean	Std Dev
Sample			
Rev_{it}	1,612	582,000,000	1,100,000,000
Rev_{it-1}	1,612	536,000,000	1,020,000,000
$lnRev_{it}$	1,612	19.67	0.85
$lnRev_{it-1}$	1,612	19.59	0.85
SGE Firms			
Rev_{it}	754	877,000,000	1,550,000,000
Rev_{it-1}	754	808,000,000	1,430,000,000
$lnRev_{it}$	754	19.93	1.05
$lnRev_{it-1}$	754	19.85	1.04
Non-SGE Firms			
Rev_{it}	858	323,000,000	182,000,000
Rev_{it-1}	858	296,000,000	173,000,000
$lnRev_{it}$	858	19.45	0.54
$lnRev_{it-1}$	858	19.36	0.54

Panel B: 2018/19 firm years with all data available

	n	Mean	Std Dev
Sample			
Rev_{it}	1,702	603,000,000	1,240,000,000
Rev_{it-1}	1,702	559,000,000	1,080,000,000
$lnRev_{it}$	1,702	19.69	0.86
$lnRev_{it-1}$	1,702	19.63	0.85
SGE Firms			
Rev_{it}	761	935,000,000	1,780,000,000
Rev_{it-1}	761	862,000,000	1,550,000,000
$lnRev_{it}$	761	19.97	1.06
$lnRev_{it-1}$	761	19.89	1.06
Non-SGE Firms			
Rev_{it}	941	335,000,000	201,000,000
Rev_{it-1}	941	313,000,000	182,000,000
$lnRev_{it}$	941	19.47	0.56
$lnRev_{it-1}$	941	19.41	0.55

Panel C: 2019/20 firm years with all data available

	n	Mean	Std Dev
Sample			
Rev_{it}	1,776	616,000,000	1,310,000,000
Rev_{it-1}	1,776	590,000,000	1,220,000,000
$lnRev_{it}$	1,776	19.69	0.87
$lnRev_{it-1}$	1,776	19.66	0.86
SGE Firms			
Rev_{it}	780	966,000,000	1,900,000,000
Rev_{it-1}	780	927,000,000	1,770,000,000
$lnRev_{it}$	780	19.96	1.09
$lnRev_{it-1}$	780	19.94	1.08
Non-SGE Firms			
Rev_{it}	996	342,000,000	219,000,000
Rev_{it-1}	996	327,000,000	197,000,000
$lnRev_{it}$	996	19.48	0.58
$lnRev_{it-1}$	996	19.45	0.56

These tables report descriptive statistics for revenues (both raw and log-transformed) for firm years with complete data, SGE firms, and Non-SGE firms for 2018–2020.

Appendix B3.2 t-tests for changes in revenues within and between groups

Panel A: t-tests for changes in revenues within and between groups, 2017/18

	n	Mean	t-stat.	p-value
Sample (within-group)				
ΔRev_{it}	1,612	46,200,000	7.19	0.000
$\Delta lnRev_{it}$	1,612	0.08	12.84	0.000
SGE firms (within-group)				
ΔRev_{it}	754	68,800,000	5.18	0.000
$\Delta lnRev_{it}$	754	0.08	7.47	0.000
Non-SGE firms (within-group)				
ΔRev_{it}	858	26,300,000	8.86	0.000
$\Delta lnRev_{it}$	858	0.09	10.88	0.000
Between SGE and Non-SGE firms				
ΔRev_{it}	1,612	−42,500,000	−3.31	0.001
$\Delta lnRev_{it}$	1,612	0.01	0.94	0.346

Panel B: t-tests for changes in revenues within and between groups, 2018/19

	n	Mean	t-stat.	p-value
Sample (within-group)				
ΔRev_{it}	1702	44,600,000	5.21	0.000
$\Delta lnRev_{it}$	1702	0.07	9.82	0.000
SGE firms (within-group)				
ΔRev_{it}	761	72,500,000	3.88	0.000
$\Delta lnRev_{it}$	761	0.07	6.62	0.000
Non-SGE firms (within-group)				
ΔRev_{it}	941	22,100,000	6.80	0.000
$\Delta lnRev_{it}$	941	0.06	7.30	0.000
Between SGE and Non-SGE firms				
ΔRev_{it}	1702	-50,400,000	-2.93	0.003
$\Delta lnRev_{it}$	1702	-0.01	-0.89	0.3761

Panel C: t-tests for changes in revenues within and between groups, 2019/20

	n	Mean	t-stat.	p-value
Sample (within-group)				
ΔRev_{it}	1776	25,800,000	2.78	0.006
$\Delta lnRev_{it}$	1776	0.02	3.43	0.001
SGE firms (within-group)				
ΔRev_{it}	780	39,800,000	1.92	0.055
$\Delta lnRev_{it}$	780	0.01	1.09	0.275
Non-SGE firms (within-group)				
ΔRev_{it}	996	14,900,000	4.37	0.000
$\Delta lnRev_{it}$	996	0.03	3.79	0.000
Between SGE and Non-SGE firms				
ΔRev_{it}	1776	-24,900,000	-1.33	0.183
$\Delta lnRev_{it}$	1776	0.02	1.47	0.1418

These tables report t-tests for changes in revenues and log-transformed revenues within and between SGE and Non-SGE firms for 2018-2020. t-statistics and p-values are reported.

Appendix B3.3 Descriptive statistics: taxes payable for SGE and non-SGE firms

Panel A: 2017/18 firm years with all data available

	n	Mean	Std Dev
Sample			
$TaxPay_{it}$	988	16,600,000	48,300,000
$TaxPay_{it-1}$	988	13,000,000	32,300,000
$lnTaxPay_{it}$	988	15.51	1.5324
$lnTaxPay_{it-1}$	988	15.34	1.5322
SGE Firms			
$TaxPay_{it}$	460	25,600,000	68,700,000
$TaxPay_{it-1}$	460	19,500,000	45,300,000
$lnTaxPay_{it}$	460	15.80	1.6241
$lnTaxPay_{it-1}$	460	15.59	1.7087
Non-SGE Firms			
$TaxPay_{it}$	528	8,669,479	11,400,000
$TaxPay_{it-1}$	528	7,321,594	9,596,664
$lnTaxPay_{it}$	528	15.26	1.4024
$lnTaxPay_{it-1}$	528	15.11	1.3220

Panel B: 2018/19 firm years with all data available

	n	Mean	Std Dev
Sample			
$TaxPay_{it}$	1047	17,600,000	59,900,000
$TaxPay_{it-1}$	1047	16,200,000	47,900,000
$lnTaxPay_{it}$	1047	15.50	1.4944
$lnTaxPay_{it-1}$	1047	15.48	1.5150
SGE Firms			
$TaxPay_{it}$	472	28,200,000	87,000,000
$TaxPay_{it-1}$	472	25,800,000	69,200,000
$lnTaxPay_{it}$	472	15.83	1.5082
$lnTaxPay_{it-1}$	472	15.78	1.5805
Non-SGE Firms			
$TaxPay_{it}$	575	8,886,103	13,100,000
$TaxPay_{it-1}$	575	8,366,287	10,800,000
$lnTaxPay_{it}$	575	15.22	1.4271
$lnTaxPay_{it-1}$	575	15.23	1.4128

Panel C: 2019/20 firm years with all data available

	n	Mean	Std Dev
Sample			
$TaxPay_{it}$	1092	16,800,000	48,200,000
$TaxPay_{it-1}$	1092	17,300,000	58,800,000
$lnTaxPay_{it}$	1092	15.46	1.5319
$lnTaxPay_{it-1}$	1092	15.48	1.4979
SGE Firms			
$TaxPay_{it}$	500	24,800,000	67,700,000
$TaxPay_{it-1}$	500	27,000,000	84,600,000
$lnTaxPay_{it}$	500	15.74	1.5349
$lnTaxPay_{it-1}$	500	15.80	1.4896
Non-SGE Firms			
$TaxPay_{it}$	592	9,952,290	17,600,000
$TaxPay_{it-1}$	592	8,986,195	13,500,000
$lnTaxPay_{it}$	592	15.23	1.4910
$lnTaxPay_{it-1}$	592	15.21	1.4516

These tables report descriptive statistics for taxes payable (both raw and log-transformed) for firm years with complete data, SGE firms, and Non-SGE firms for 2018–2020.

Appendix B3.4 t-tests for changes in taxes payable within and between groups

Panel A: t-tests for changes in taxes payable within and between groups, 2017/18

	n	Mean	t-stat.	p-value
Sample (within-group)				
$\Delta TaxPay_{it}$	988	3,597,255	5.04	0.000
$\Delta lnTaxPay_{it}$	988	0.18	5.19	0.000
SGE firms (within-group)				
$\Delta TaxPay_{it}$	460	6,179,140	4.14	0.000
$\Delta lnTaxPay_{it}$	460	0.21	3.54	0.000
Non-SGE firms (within-group)				
$\Delta TaxPay_{it}$	528	1,347,885	5.02	0.000
$\Delta lnTaxPay_{it}$	528	0.15	3.94	0.000
Between SGE and Non-SGE firms				
$\Delta TaxPay_{it}$	988	-4,831,255	-3.40	0.001
$\Delta lnTaxPay_{it}$	988	-0.06	-0.87	0.385

Panel B: t-tests for changes in taxes payable within and between groups 2018/19

	n	Mean	t-stat.	p-value
Sample (within-group)				
$\Delta TaxPay_{it}$	1047	1,393,036	1.60	0.111
$\Delta lnTaxPay_{it}$	1047	0.02	0.61	0.539
SGE firms (within-group)				
$\Delta TaxPay_{it}$	472	2,456,812	1.29	0.199
$\Delta lnTaxPay_{it}$	472	0.05	1.13	0.261
Non-SGE firms (within-group)				
$\Delta TaxPay_{it}$	575	519,816	1.97	0.050
$\Delta lnTaxPay_{it}$	575	-0.01	-0.23	0.819
Between SGE and Non-SGE firms				
$\Delta TaxPay_{it}$	1047	-1,936,996	-1.10	0.270
$\Delta lnTaxPay_{it}$	1047	-0.06	-1.01	0.313

Panel C: t-tests for changes in taxes payable within and between groups, 2019/20

	n	Mean	t-stat.	p-value
Sample (within-group)				
$\Delta TaxPay_{it}$	1092	-499,062	-0.67	0.506
$\Delta lnTaxPay_{it}$	1092	-0.02	-0.80	0.426
SGE firms (within-group)				
$\Delta TaxPay_{it}$	500	-2,233,807	-1.43	0.154
$\Delta lnTaxPay_{it}$	500	-0.07	-1.65	0.099
Non-SGE firms (within-group)				
$\Delta TaxPay_{it}$	592	966,095	2.39	0.017
$\Delta lnTaxPay_{it}$	592	0.01	0.35	0.724
Between SGE and Non-SGE firms				
$\Delta TaxPay_{it}$	1092	3,199,902	2.13	0.034
$\Delta lnTaxPay_{it}$	1092	0.08	1.41	0.159

These tables report t-tests for changes in taxes payable and log-transformed tax payable within and between SGE and Non-SGE firms for 2018-2020. t-statistics and p-values are reported.

Appendix B3.5 Descriptive statistics: tax rates for SGE and non-SGE firms

Panel A: 2017/18 firm years with all data available

	n	Mean	Std Dev
Sample			
$Rate_{it}$	988	0.0280	0.0307
$Rate_{it-1}$	988	0.0256	0.0280
SGE Firms			
$Rate_{it}$	460	0.0280	0.0299
$Rate_{it-1}$	460	0.0254	0.0261
Non-SGE Firms			
$Rate_{it}$	528	0.0279	0.0314
$Rate_{it-1}$	528	0.0259	0.0295

Panel B: 2018/19 firm years with all data available

	n	Mean	Std Dev
Sample			
$Rate_{it}$	1047	0.0262	0.0288
$Rate_{it-1}$	1047	0.0275	0.0300
SGE Firms			
$Rate_{it}$	472	0.0257	0.0273
$Rate_{it-1}$	472	0.0272	0.0304
Non-SGE Firms			
$Rate_{it}$	575	0.0266	0.0299
$Rate_{it-1}$	575	0.0277	0.0297

Panel C: 2019/20 firm years with all data available

	n	Mean	Std Dev
Sample			
$Rate_{it}$	1092	0.0263	0.0329
$Rate_{it-1}$	1092	0.0267	0.0307
SGE Firms			
$Rate_{it}$	500	0.0242	0.0268
$Rate_{it-1}$	500	0.0256	0.0277
Non-SGE Firms			
$Rate_{it}$	592	0.0280	0.0372
$Rate_{it-1}$	592	0.0276	0.0330

These tables report descriptive statistics for tax rates for firm years with complete data, SGE firms, and Non-SGE firms for 2018–2020.

Appendix B3.6 t-tests for changes in tax rates within and between groups

Panel A: t-tests for changes in tax rates within and between groups, 2017/18

	n	Mean	t-stat.	p-value
Sample (within-group)				
$\Delta Rate_{it}$	988	0.0023	4.22	0.000
SGE firms (within-group)				
$\Delta Rate_{it}$	460	0.0026	3.56	0.000
Non-SGE firms (within-group)				
$\Delta Rate_{it}$	528	0.0021	2.56	0.011
Between SGE and Non-SGE firms				
$\Delta Rate_{it}$	988	-0.0006	-0.51	0.609

Panel B: t-tests for changes in tax rates within and between groups, 2018/19

	n	Mean	t-stat.	p-value
Sample (within-group)				
$\Delta Rate_{it}$	1047	-0.0013	-2.35	0.019
SGE firms (within-group)				
$\Delta Rate_{it}$	472	-0.0015	-1.57	0.116
Non-SGE firms (within-group)				
$\Delta Rate_{it}$	575	-0.0011	-1.82	0.070
Between SGE and Non-SGE firms				
$\Delta Rate_{it}$	1047	0.0004	0.39	0.696

Panel C: t-tests for changes in tax rates within and between groups, 2019/20

	n	Mean	t-stat.	p-value
Sample (within-group)				
$\Delta Rate_{it}$	1092	-0.0004	-0.77	0.441
SGE firms (within-group)				
$\Delta Rate_{it}$	500	-0.0014	-1.89	0.059
Non-SGE firms (within-group)				
$\Delta Rate_{it}$	592	0.0004	0.47	0.637
Between SGE and Non-SGE firms				
$\Delta Rate_{it}$	1092	0.0017	1.59	0.111

These tables report t-tests for changes in tax rates within and between SGE and Non-SGE firms for 2018-2020. t-statistics and p-values are reported.

Chapter 4

Conclusion

4.1 Conclusions

This thesis investigates a global concern: corporate tax avoidance (CTA) and its impact on government tax revenues. It begins by examining the underlying incentives that drive CTA, with a particular focus on executive compensation tied to after-tax performance targets. Understanding these incentives is critical, as long-term success in constraining CTA depends on effectively managing them. The analysis then turns to Australia's legislative response – specifically the Multinational Anti-Avoidance Law (MAAL) and Diverted Profits Tax (DPT) – to evaluate whether these measures have had a sustained impact on reducing CTA among foreign significant global entities (SGEs) operating in the country.

Chapter 2 explores whether performance targets in management compensation contracts influence CTA. The analysis focuses on a sample of Australian firms that distribute dividends with tax credits, where shareholder incentives for tax avoidance are largely neutralized. In this context, after-tax performance targets may encourage managers to adopt aggressive tax strategies that provide no benefits to shareholders.

The findings from Chapter 2 indicate minimal evidence of CTA for the 60.4% of sample firms that employ before tax performance targets to determine management compensation. However, the 39.6% of firms that utilise after-tax performance targets are the focus of this investigation into tax avoidance. More importantly, the ability to investigate tax avoidance for firms utilising after-tax performance targets provides the evidence of the impact of tax avoidance on management compensation.

Chapter 2 provides evidence of CTA among firms that utilise after-tax performance targets in management compensation contracts. Since these firms lack shareholder incentives for tax avoidance, engaging in such strategies – particularly if they incur costs – may indicate "rent extraction" by managers. Further analysis suggests that this behaviour is more prevalent among highly profitable firms. However, caution is advised, as firms with poor performance

are more likely to recognize non-deductible expenses (e.g., goodwill impairment), which could distort the measurement of CTA and introduce bias against detecting such behaviour in these firms.

Chapter 3 aims to assess the long-term effectiveness of unilateral legislative strategies, specifically MAAL and DPT, in restricting CTA, expanding on the findings of Wells et al. (2024) within the context of the 'PwC tax scandal.' Australia presents a distinctive case, as the scandal serves as a stark example that, despite these legislative strategies, multinational corporations (MNCs) remain incentivized to engage in CTA. This suggests that such policies primarily act as constraints rather than deterrents, potentially only raising the costs associated with tax avoidance. It is a cost/benefit decision by MNCs as to whether to pay tax on Australian earnings in Australia or shift these earnings to lower tax jurisdiction countries. Despite the implementation of MAAL and DPT, tax avoidance appears to remain beneficial overall, as evidenced by PwC's involvement in designing tax minimization strategies and advising foreign MNCs even after this legislation came into effect. Furthermore, Australia stands out as one of the few – if not the only – country to have introduced multiple unilateral anti-avoidance laws over the past decade while also mandating tax return data disclosure by the ATO. These initiatives were ultimately intended to increase the tax contributions of MNCs operating in Australia.

Although tax revenues reported in Australia by foreign SGE firms initially increased following the enactment of the legislation (Wells et al., 2024), this research presents evidence of a subsequent decline in later years that supports hypothesis 1 of Chapter 3. One possible explanation is that the CTA strategy linked to the PwC tax scandal involved developing new schemes to shift revenue recognition to lower tax jurisdictions outside Australia, effectively bypassing MAAL. Moreover, albeit unreported, anecdotal evidence from tax professionals supports this interpretation, also evidenced by the current detailed investigation into the PwC

case and newspaper articles. Furthermore, this chapter also finds that while taxes paid by foreign SGE firms rose immediately (the year) after the legislation was introduced (Wells et al., 2024), they declined in the following year only providing mixed support for hypothesis 2. Overall, these findings potentially indicate that Australia's unilateral efforts to constrain CTA have had only a temporary effect.

This thesis makes a number of contributions to the literature. Chapter 2 contributes to the existing literature by examining the extent to which performance targets in management compensation contracts serve as incentives for CTA. This analysis takes place in an environment where shareholder incentives for tax avoidance are neutralised, eliminating the need to account for 'known and observable' factors influencing the selection of specific performance measures. Crucially, it reveals how managers engage in 'rent extraction' through CTA.

This research provides evidence that performance targets in management compensation contracts encourage CTA, supporting the idea that it serves as a strategy to enhance reported performance or manage earnings. Consequently, this research expands the earnings management literature, which has primarily focused on accruals management (e.g., Healy, 1985; Holthausen et al., 1995) and real earnings management (e.g., Bartov, 1993), by recognizing CTA as a potential earnings management tool.

Furthermore, the public exposure of the PwC tax scandal in 2023 serves as preliminary evidence that, despite the implementation of some of the most robust unilateral anti-avoidance legislative strategies, their effectiveness may be, at best, temporary. This aligns with the widely held belief in practice that tax consultants and MNCs consistently stay ahead of tax authorities in developing tax avoidance strategies. In Australia, the conflict of interest surrounding the PwC tax scandal appears to have accelerated the development of methods to bypass MAAL and DPT just one year after their enforcement. Therefore, policymakers must carefully consider

various factors when implementing new unilateral anti-avoidance legislative strategies to enhance their long-term effectiveness. This includes restricting the profession's involvement in drafting legislation and reinforcing conflict-of-interest regulations. In Australia, these efforts are already underway (Chalmers, 2023). More importantly, policymakers must acknowledge that unilateral anti-avoidance strategies can, at best, limit CTA by increasing its costs, but over time, MNCs will develop new ways to circumvent the legislation. Consequently, the cost of CTA must be significantly raised, while simultaneously introducing legislative reforms that reduce the incentives therefor – such as Australia's dividend imputation system. Only by implementing these strategies CTA can be effectively mitigated (McClure et al., 2018).

Moreover, the findings in this thesis offer initial insights that extend beyond unilateral strategies and apply to anti-avoidance legislative strategies more broadly. In particular, the conflict of interest stemming from PwC's role in both drafting legislation and later advising on ways to circumvent DPT raises wider concerns. This issue mirrors the involvement of certain jurisdictions that facilitate CTA in shaping multilateral tax policies. At the multilateral level, these concerns are even more pronounced, given the historically limited action taken. However, in recent years, the introduction of the Global Minimum Tax initiative, which has now been legislated in Australia (ATO, 2024c; Ravlic, 2024) is aimed at addressing this issue.

4.2 Limitations and areas of future research.

This research has notable limitations in its design, which in turn affects the findings in this thesis. One key limitation concerns the ATO data, which includes only three tax return variables, restricting the ability to implement a more robust research approach. Expanding the data provided by the ATO would allow for a more precise assessment of CTA, particularly through the disclosure of current and carried-forward taxable losses and whether entities on the

ATO disclosure list are subject to anti-avoidance legislation (i.e., Significant Global Entities or SGE firms). Another constraint is the inability to integrate ATO data with other sources, which prevents a comprehensive cross-sectional analysis of CTA. If corporate filings with the Australian Securities and Investments Commission (ASIC) were made freely accessible (rather than pay-per-view) and available in a machine-readable format (such as digital financial reporting), it would enhance the ability to determine when tax avoidance strategies were first implemented. Such an enriched dataset would support cross-sectional studies of firm characteristics and tax behaviour, panel data models that control for firm-specific effects over time, and difference-in-differences techniques to assess the causal impact of major policy changes on corporate tax outcomes. By facilitating the use of more advanced statistical techniques, such an approach would substantially improve the robustness, validity, and generalisability of the research findings.

The ethical, legal, and social consequences of the PwC tax scandal will likely have a lasting impact on tax avoidance professionals. Policymakers must recognize that unilateral measures alone are insufficient to constrain CTA. A combination of increased costs, reduced incentives, and multilateral cooperation is essential to effectively mitigate CTA. Additional research will be required to shed further light on this issue.

Future research should incorporate newly disclosed ATO data to further examine the long-term effectiveness of MAAL and DPT in reducing CTA. This is particularly relevant from 2023 onward, given the impact of various government inquiries and investigations into the PwC tax scandal. Additionally, from the 2024/25 period, MNCs in Australia will be required to disclose new tax data under the proposed country-by-country tax reporting regime (MinterEllison, 2024). This data is expected to enable a more precise assessment of MNCs' CTA practices and support the development of more rigorous research designs.

References.

Abadie, A. (2005). Semiparametric difference-in-differences estimators. *The Review of Economic Studies, 72*(1), 1–19.

Ainsworth, K. (2023, June 5). What is the PwC tax scandal? Who is Peter-John Collins? Who knew about it? Why does it matter? *ABC News*. https://www.abc.net.au/news/2023-06-05/pwc-pricewaterhousecoopers-government-tax-leak-scandal-explained/102409528

Alderman, L., Tankersley, J., & Nelson, E. (2021, July 1). US proposal for 15% global minimum tax wins support from 130 countries. *The New York Times.* https://www.nytimes.com/2021/07/01/business/global-minimum-tax.html

Ali, H. (2022). *Corporate dividend policy in the time of COVID-19: Evidence from the G-12 countries*. *Finance Research Letters, 46*, Article 102493. https://doi.org/10.1016/j.frl.2021.102493

Angrist, J. D., & Pischke, J.-S. (2009). *Mostly harmless econometrics: An empiricist's companion*. Princeton University Press.

Atwood, T. J., Drake, M. S., Myers, J. N., & Myers, L. A. (2012). Home country tax system characteristics and corporate tax avoidance: International evidence. *The Accounting Review, 87*(6), 1831–1860.

Australian Government. (2024a). *Corporate tax transparency: 2013-14 report of entity tax information* [Data set]. Data.gov.au. https://data.gov.au/data/dataset/corporate-transparency/resource/237d7ede-3a63-4b9b-9434-2f79b9d70ce8

Australian Government. (2024b). *Corporate tax transparency: 2014-15 report of entity tax information* [Data set]. Data.gov.au. https://data.gov.au/data/dataset/corporate-transparency/resource/1e8c8ae0-81d1-4780-a669-9e4a2a6ba1a4

Australian National Audit Office. (2019, December 16). *Tax avoidance taskforce: Meeting budget commitments.* https://www.anao.gov.au/work/performance-audit/tax-avoidance-taskforce-meeting-budget-commitments

Australian Prudential Regulation Authority. (2020, July 29). *APRA updates guidance on capital management for banks and insurers.* https://www.apra.gov.au/news-and-publications/apra-updates-guidance-on-capital-management-for-banks-and-insurers

Australian Taxation Office. (2016). *Corporate tax transparency report for the 2014–15 income year.* https://www.ato.gov.au/businesses-and-organisations/corporate-tax-measures-and-assurance/large-business/in-detail/tax-transparency/corporate-tax-transparency-report-for-the-2014-15-income-year

Australian Taxation Office. (2024a, November 1). *ATO collects $100 billion from large corporates.* https://www.ato.gov.au/media-centre/ato-collects-100-billion-dollars-from-large-corporates

Australian Taxation Office. (2024b, November 1). *A strong domestic tax regime.* https://www.ato.gov.au/about-ato/learn-about-tax-and-the-ato/tax-and-corporate-australia/a-strong-domestic-tax-regime

Australian Taxation Office. (2024c, August 14). *Implementation of a global minimum tax and a domestic minimum tax. Australian Taxation Office.* https://www.ato.gov.au/about-ato/new-legislation/in-detail/international/implementation-of-a-global-minimum-tax-and-a-domestic-minimum-tax

Barrett, J. (2023, May 31). PwC Australia scandal: What actually happened and will it be fatal for the advisory firm? *The Guardian.* https://www.theguardian.com/australia-news/2023/may/31/pwc-australia-scandal-what-actually-happened-and-will-it-be-fatal-for-the-advisory-firm

Barrett, J., & Basford Canales, S. (2024, June 12). 'Disregard for truth': Inquiry calls for greater scrutiny of private consultants following PwC tax scandal. *The Guardian.*

https://www.theguardian.com/business/article/2024/jun/12/pwc-report-senate-inquiry-calls-for-greater-scrutiny-of-private-consultants-ntwnfb

Bartov, E. (1993). The Timing of Asset Sales and Earnings Manipulation. *The Accounting Review, 68*(4), 840-855.

Bebchuk, L. A., & Fried, J. M. (2003). Executive Compensation as an Agency Problem. *Journal of Economic Perspectives, 17*(3), 71-92.

Belot, H. (2023, May 12). Disgraceful breach of trust: How PwC, one of the world's biggest accountancy firms, became mired in a tax scandal. *The Guardian.* https://www.theguardian.com/business/2023/may/12/disgraceful-breach-of-trust-how-pwc-one-of-the-worlds-biggest-accountancy-firms-became-mired-in-a-tax-scandal

Bertrand, M., Duflo, E., & Mullainathan, S. (2004). How much should we trust differences-in-differences estimates? *Quarterly Journal of Economics*, *119*(1), 249–275.

Blundell, R., & Costa Dias, M. (2009). Alternative approaches to evaluation in empirical microeconomics. *Journal of Human Resources*, *44*(3), 565–640.

Brewer, M., Crossley, T. F., & Joyce, R. (2018). Inference with difference-in-differences revisited. *Journal of Econometric Methods*, *7*(1), Article 20170005.

Chalmers, J. (2023, August 6). Government taking decisive action in response to PwC tax leaks scandal [Media release]. The Hon Dr Jim Chalmers MP. https://ministers.treasury.gov.au/ministers/jim-chalmers-2022/media-releases/government-taking-decisive-action-response-pwc-tax-leaks

Chen, K. P., & Chu, C. Y. C. (2005). Internal Control vs. External Manipulation: A Model of Corporate Income Tax Evasion. RAND *Journal of Economics, 36*(4), 151-164.

Chenoweth, N. (2023, January 20). PwC partner leaked government tax plans to clients. *Australian Financial Review.* https://www.afr.com/companies/financial-services/pwc-partner-leaked-government-tax-plans-to-clients-20230120-p5ceaz

Chenoweth, N., & Tadros, E. (2023, May 4). The inside story of PwC's tax scandal. *Australian Financial Review.* https://www.afr.com/companies/professional-services/the-inside-story-of-pwc-s-tax-scandal-20230504-p5d5k5

Christie, A. A. (1987). On cross-sectional analysis in accounting research. *Journal of Accounting and Economics, 9*(3), 231–258.

Coulton, J., Ruddock, C., & Taylor, S. (2014). The Informativeness of Dividends and Associated Tax Credits. *Journal of Business Finance & Accounting, 41*(9-10), 1309-1336.

Crocker, K. J., & Slemrod, J. (2005). Corporate tax evasion with agency costs. *Journal of Public Economics, 89*(9), 1593-1610.

Daw, J. R., & Hatfield, L. A. (2018). Matching and regression to the mean in difference-in-differences analysis. *Health Services Research, 53*(6), 4138–4156.

Dechow, P. M., Huson, M. R., & Sloan, R. G. (1994). The Effect of Restructuring Charges on Executives' Cash Compensation. *The Accounting Review,* 69(1), 138-156.

Desai, M. A., & Dharmapala, D. (2006). Corporate tax avoidance and high-powered incentives. *Journal of Financial Economics, 79*(1), 145-179.

Desai, M. A., & Dharmapala, D. (2009). Earnings Management, Corporate Tax Shelters, and Book-Tax Alignment. *National Tax Journal, 62*(1), 169-186.

Dhaliwal, D., Gleason, C., & Mills, L. (2004). Last-chance earnings management: Using the tax expense to meet analysts' forecasts. *Contemporary Accounting Research, 21*(2), 431–459.

Dhaliwal, D., & Wang, S. (1992). The effect of book income adjustment in the 1986 alternative minimum tax on corporate financial reporting. *Journal of Accounting and Economics, 15*(1), 7–26.

Diebold, F. X. (2003). *Elements of forecasting* (3rd ed.). South-Western.

Dyreng, S., Hanlon, M., & Maydew, E. (2008). Long-run corporate tax avoidance. *The Accounting Review, 83*(1), 61–82.

Enders, W. (2014). *Applied econometric time series* (4th ed.). Wiley.

Finance (No. 2) Act 2015 (UK).

Fleisher, L. (2014, December 4). U.K.'s "Google tax" draws scepticism. *The Wall Street Journal.* https://www.wsj.com/articles/u-k-s-google-tax-draws-skepticism-1417727208

Gaertner, F. B. (2014). CEO After-Tax Compensation Incentives and Corporate Tax Avoidance. *Contemporary Accounting Research, 31*(4), 1077-1102.

Gale, W., Gelfond, H., Krupkin, A., Mazur, M., & Toder, E. (2018). Effects of the Tax Cuts and Jobs Act: A preliminary analysis. *SSRN Electronic Journal.*

Goodman-Bacon, A. (2021). Difference-in-differences with variation in treatment timing. *Journal of Econometrics, 225*(2), 254–277.

Griffin, B. A., Schuler, M. S., Stuart, E. A., Patrick, S., McNeer, E., Smart, R., Powell, D., Stein, B. D., Schell, T. L., & Pacula, R. L. (2021). Moving beyond the classic difference-in-differences model: A simulation study comparing statistical methods for estimating effectiveness of state-level policies. *BMC Medical Research Methodology, 21*, 279.

Gujarati, D. N., & Porter, D. C. (2009). *Basic econometrics* (5th ed.). McGraw-Hill/Irwin.

Gupta, S., & Newberry, K. (1997). Determinants of the variability on corporate effective tax rates: evidence from longitudinal data. *Journal of Accounting and Public Policy, 16*(1), 1–34.

Hamilton, J. D. (1994). *Time series analysis.* Princeton University Press.

Hanlon, M., & Heitzman, S. (2010). A review of tax research. *Journal of Accounting and Economics, 50*(2–3), 127-178.

Hanlon, M., & Slemrod, J. (2009). What does tax aggressiveness signal? Evidence from stock price reactions to news about tax shelter involvement. *Journal of Public Economics, 93*(1–2), 126-141.

Healy, P. M. (1985). The effect of bonus schemes on accounting decisions. *Journal of Accounting and Economics,* 7(1–3), 85-107.

Heckman, J. J. (1979). *Sample selection bias as a specification error*. *Econometrica, 47*(1), 153–161.

Hoi, C. K., Wu, Q., & Zhang, H. (2013). Is Corporate Social Responsibility (CSR) Associated with Tax Avoidance? Evidence from Irresponsible CSR Activities. *The Accounting Review, 88*(6), 2025-2059.

Holthausen, R. W., Larcker, D. F., & Sloan, R. G. (1995). Annual bonus schemes and the manipulation of earnings. *Journal of Accounting and Economics, 19*(1), 29-74.

Hope, O.-K., Thomas, W. B., & Vyas, D. (2013). Financial reporting quality of US private and public firms. *The Accounting Review, 88*(5), 1715–1742.

Hulley, S. B., Cummings, S. R., Browner, W. S., Grady, D. G., & Newman, T. B. (2013). *Designing clinical research* (4th ed.). Lippincott Williams & Wilkins.

Hutchens, G. (2016, December 9). More than a third of big companies paid no tax in 2014-15, ATO reports. *The Guardian.* https://www.theguardian.com/australia-news/2016/dec/09/more-than-a-third-of-big-companies-paid-no-tax-in-2014-15-ato-reports

Income Tax Assessment Act 1936 (Cth), Pt IVA.

Janus Henderson Investors. (2021, February 22). *Pandemic caused $220 bn of global dividend cuts in 2020, but the decline was less severe than feared.* https://www.janushenderson.com/en-us/advisor/press-releases/pandemic-caused-220bn-of-global-dividends-cuts-in-2020-but-the-decline-was-less-severe-than-feared/

Khadem, N. (2016, June 13). ATO recruits executives for new tax avoidance taskforce hunting tax cheats, multinationals. *The Sydney Morning Herald.* https://www.smh.com.au/business/the-economy/ato-recruits-executives-for-new-tax-avoidance-taskforce-hunting-tax-cheats-multinationals-20160613-gphqew.html

Kruger, C. (2024, November 4). AFP raids PwC offices over tax scandal. *The Sydney Morning Herald.* https://www.smh.com.au/business/companies/afp-raids-pwc-offices-over-tax-scandal-20241104-p5knsw.html

Lanis, R., & Richardson, G. (2013). Corporate social responsibility and tax aggressiveness: a test of legitimacy theory. *Accounting, Auditing & Accountability Journal, 26*(1), 75-100.

Lanis, R., Wells, P., Govendir, B., & McClure, R. (2020). Does the Australian Taxation Office disclosure of information impact the costs of tax aggressiveness: Evidence from the Tax Laws Amendment (2013 Measures No. 2) Act 2013 over the period 2015–2018. *Australian Tax Forum, 35*(3), 521-565.

Leuz, C., & Wysocki, P. D. (2016). The economics of disclosure and financial reporting regulation: Evidence and suggestions for future research. *Journal of Accounting Research, 54*(2), 525–622.

Levin, C. (2013) Offshore profit shifting and the US tax code-part 2 (Apple Inc.) [May 21, 2013], (2013).

Leys, C., Ley, C., Klein, O., Bernard, P. & Licata, L. (2013). Detecting outliers: Do not use standard deviation around the mean, use absolute deviation around the median. J*ournal of experimental social psychology*, *49*(4), 764-766.

Lowrey, T. (2023, February 16). ATO says millions in annual tax could have been lost due to PwC confidentiality breaches. *ABC News.* https://www.abc.net.au/news/2023-02-16/australian-tax-office-million-scheme-pricewaterhousecoopers/101980548

Matolcsy, Z., Tyler, J., & Wells, P. (2011). The Impact of Quasi-Regulatory Reforms on Boards and Their Committees During the Period 2001–2007. *Australian Accounting Review, 21*(4), 352-364.

McClure, R., Lanis, R., Wells, P., & Govendir, B. (2018). The impact of dividend imputation on corporate tax avoidance: The case of shareholder value. *Journal of Corporate Finance, 48*, 492-514.

McIlroy, T. (2017, July 28). Labor questions coalition's multinational tax clawback. *The Canberra Times.* http://www.canberratimes.com.au/national/public-service/labor-questions-coalitions-multinational-tax-clawback-20170728-gxkqd1.html

MinterEllison. (2024). *New public country-by-country tax reporting rules.* https://www.minterellison.com/articles/new-public-country-by-country-tax-reporting-rules

Morrison, S. (2015, March 18). *Multinationals paying tax on Australian profits. Australian Government - Treasury.* https://ministers.treasury.gov.au/ministers/scott-morrison-2015/media-releases/multinationals-paying-tax-australian-profits

Newman, H. A. (1989). Selection of Short-Term Accounting-Based Bonus Plans. *Accounting Review,* 64(4), 758. Retrieved from https://www.lib.uts.edu.au/goto?url=http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=4478095&site=ehost-live

OECD. (2013). *Addressing base erosion and profit shifting.* OECD Publishing.

Offshore profit shifting and the US tax code-part 2 (Apple Inc.) [May 21, 2013], (2013).

Parliament of Australia. (2024). *Parliamentary Joint Committee on Corporations and Financial Services: Inquiry into consultancy firms: Final report.* Parliament of Australia. https://www.aph.gov.au/Parliamentary_Business/Committees/Joint/Corporations_and_Financial_Services/ConsultancyFirms/Report

Patino, C. M., & Ferreira, J. C. (2018). *Inclusion and exclusion criteria in research studies: Definitions and why they matter*. *Jornal Brasileiro de Pneumologia, 44*(2), 84.

Phillips, J. D. (2003). Corporate Tax-Planning Effectiveness: The Role of Compensation-Based Incentives. *Accounting Review,* 78(3), 847-874.

Powers, K., Robinson, J. R., & Stomberg, B. (2016). How do CEO incentives affect corporate tax planning and financial reporting of income taxes? *Review of Accounting Studies, 21*(2), 672-710.

PwC. (2016, March 2). *Australia's new multinational anti-avoidance law: Key issues*. PwC. https://www.pwc.com/jp/en/taxnews-international/assets/its-australia-20160302-en.pdf

Queensland Law Society. (2024, October). *Lessons from the PwC tax leak scandal*. Queensland Law Society. https://www.qlsproctor.com.au/2024/10/lessons-from-the-pwc-tax-leak-scandal/

Ravlic, T. (2024, August 22). *Australia moves closer to Pillar Two*. International Tax Review. https://www.internationaltaxreview.com/article/2dnuh73qo6kyl0wsg9tz4/direct-tax/australia-moves-closer-to-pillar-two

Rego, S. O., & Wilson, R. (2012). Equity Risk Incentives and Corporate Tax Aggressiveness. *Journal of Accounting Research, 50*(3), 775-810.

Roth, J., Sant'Anna, P. H. C., Bilinski, A., & Poe, J. (2023). What's trending in difference-in-differences? A synthesis of the recent econometrics literature. *Journal of Econometrics*, *235*(2), 2218–2244.

Ryan, A. M., Burgess, J. F., Jr., & Dimick, J. B. (2015). Why we should not be indifferent to specification choices for difference-in-differences. *Health Services Research, 50*(4), 1211–1235.

Saavedra, D. (2013). *Analysis of unsuccessful tax avoiders.* Retrieved from SSRN: https://ssrn.com/abstract=2486917

Schwab, C. M., Stomberg, B. and Xia, J., 2022. What determines effective tax rates? The relative influence of tax and other factors. *Contemporary Accounting Research,* 39(1), 459-497.

Stickney, C., & McGee, V. (1982). Effective corporate tax rates: the effect of size, capital intensity, leverage, and other factors. *Journal of Accounting and Public Policy, 1*(2), 125–152.

Stock, J. H., & Watson, M. W. (2002). *Introduction to econometrics*. Addison-Wesley.

Tadros, E. (2024, August 10). The PwC players: The blowback and why it could all happen again. *Australian Financial Review*. https://www.afr.com/companies/professional-services/the-pwc-players-the-blowback-and-why-it-could-all-happen-again-20240809-p5k0zv

Tadros, E., & Chenoweth, N. (2023, May 31). PwC faces fresh probe into its tax leaks scandal. *Australian Financial Review*. https://www.afr.com/companies/professional-services/pwc-faces-fresh-probe-into-its-tax-leaks-scandal-20230526-p5dbou

Tahir, N. (2023). *An evaluation of measures of corporate tax aggressiveness: The impact of the idiosyncrasies in the tax system* (Working paper). University of Technology Sydney.

*Tax Laws Amendment (2013 Measures No. 2) Act 2013 (*No. 124, 2013).

Tax Laws Amendment (Combating Multinational Tax Avoidance) Act 2015 (No. 170, 2015).

The White House. (2021, April 7). *Remarks by President Biden on the American Jobs Plan* [Speech]. https://www.whitehouse.gov/briefing-room/speeches-remarks/2021/04/07/remarks-by-president-biden-on-the-american-jobs-plan-2/

Tran, A., & Xu, W. (2024). A study of cross-border profit shifting channels: Evidence from Australia. *Accounting and Finance, 64*(1), 869–891.

Treasury Laws Amendment (Combating Multinational Tax Avoidance) Act 2017 (No. 27, 2017).

Treasury Laws Amendment (Tax Accountability and Fairness) Bill 2023 (Cth).

Verbeek, M. (2012). *A guide to modern econometrics* (4th ed.). Wiley.

Wang, S.W. (1991). The relation between firm size and effective tax rates: A test of firms' political success. *The Accounting Review, 66*, 158-169.

Wells, P., Lanis, R., Govendir, B., Shashnov, M., & Pazmandy, G. (2024). The impact of legislative strategies to constrain corporate tax avoidance by multinational corporations. *Australian Tax Forum*, *39*(3), 433-551.

Wilkie, P., & S. Limberg. (1993). Measuring explicit tax (dis)advantage for corporate taxpayers: An alternative to average effective tax rates. *Journal of the American Taxation Association*, *15*(1), 46–71.

Wilson, R. J. (2009). An Examination of Corporate Tax Shelter Participants. *The Accounting Review,* 84(3), 969-999.

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data* (2nd ed.). MIT Press.

Wooldridge, J. M. (2016). *Introductory econometrics: A modern approach* (6th ed.). Cengage Learning.