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CORPORATE TAX PLANNING: MEASUREMENT,
INCENTIVES AND GOVERNANCE EFFECTS

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Corporate Tax Planning: Measurement, Incentives and
Governance Effects

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Abstract

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Corporate Tax Planning: Measurement, Incentives and Governance Effects

Tax planning, Tax avoidance, Corporate governance, Signalling theory, Institutional theory

This research reviews the existing Tax Planning (TP) measures and explores the consistency of UK firms' engagement in TP; evaluates incentives for TP and its value relevance in a signalling theory framework; and studies corporate governance effects on TP for the firms in an institutional theory framework. It analyses a unique set of 1,482 hand-collected firm-year observations and proposes 'undisclosed TP' as a new TP measure. It finds that firms consistently engage in TP and their TP disclosures have improved; internationally oriented firms do not engage in TP to save taxes; risky firms, firms with low operating cashflows and growing firms, however, do not engage in TP to arrange funds internally – so they signal their non-engagement in TP to the market. Further findings confirm public awareness and market valuation of firms' TP engagements. Boards' tax affiliations result in reductions in tax payments (expenses) for strongly (weakly) governed firms. Professional accountancy qualifications on the board result in significantly higher tax payments for weakly governed firms. The auditors' provided tax services (institutional ownership) result in higher tax payments for weakly (strongly) governed firms suggesting supplementary (complementary) role of auditors (institutional ownership) for the internal governance on TP. This research concludes that there is a need for further TP disclosures to reduce the information asymmetry associated with negatively valued TP activities; recommends auditors' involvement in TP services; and recommends tax affiliates on the board to bring tax savings in a strongly governed environment. The current study's findings have important theoretical and practical implications

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I dedicate this thesis to

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Glossary

ACA	Associate Chartered Accountant
ACCA	Associate Chartered Certified Accountant
AIA	Annual Investment Allowance
APTS	Auditors Provided Tax Services
AUD_C	Auditors Control
B_SIZE	Board Size
BEPS	Base Erosion and Profit Shifting
BTD	Book-Tax Difference
CAP_INT	Capital Intensity
CEO	Chief Executive Offices
CEO_D	CEO in dual role as the board chairman
CETR	Cash Effective Tax Rate
CFO	Chief Finance Officer
CIMA	Chartered Institute of Management Accountants
CIOT	Chartered Institute of Taxation
CPD	Continuous Professional Development
DPD	Dynamic Panel-Data
DT	Deferred Taxation
DTAD	Deferred Tax Adjustments
DTADJ	Deferred Tax Adjustments
EDU	Board of Directors' Education
ETR	Effective Tax Rate
EU	European Union
EXT_C	External Control
FASB	Financial Accounting Standards Board
FIN	Financial Interpretation
FRC	Financial Reporting Council
FREE_CASH	Free Cashflow
FYA	First Year Allowance
GOV_SCO	Governance Score
GSK	GlaxoSmithKline plc
HMRC	HM Revenues and Customs
IAS	International Accounting Standard
IASB	International Accounting Standards Board
ICAEW	Institute of Chartered Accountants in England and Whales
ICB	Industry Classification Benchmark
IFRS	International Financial Reporting Standard
IND_DUM	Industry Dummies
INV_INT	Inventory Intensity

LEV	Leverage
LR	Loss Relief
LSE	London Stock Exchange
MBA	Masters in Business Administration
MNEs	Multinational Enterprises
MTOBOOK	Market to Book
MULT_LIST	Multi listed firms
NAO	National Audit Office
NAS	Non-Audit Services
NED	Non-Executive Directors
NPV	Net Present Value
OECD	Organisation of Economic Countries Development
OLS	Ordinary Least Square
OSTCT	Total overseas current tax
OSTDT	Total overseas deferred tax
OSTRD	Overseas Tax Rate Difference
PAC	Parliamentary Accountability Committee
PBT	Profit Before Tax
PD	Permanent Differences
PGR	Postgraduate Research
PYTADJ	Prior Year Tax Adjustment
R&D	Research and Development
R&D_INT	Research and Development Intensity
RC	Research Credits
S&P	Standards and Poor's
SD	Standard Deviation
STR	Statutory Tax Rate
TA	Total Assets
TAX_AF	Tax Affiliations
TD	Temporary Difference
TDTAD	Tax on Deferred Tax Adjustments
TJV	Tax on Joint Ventures
TLR	Tax on Loss Relief
TOSTRD	Tax on Overseas Tax Rate Difference
TP	Tax Planning
TP_DISC	Disclosed Tax Planning
TP_TOTAL	Total Tax Planning
TP_UNDIS	Undisclosed Tax Planning
TP1	Disclosed Tax Planning
TP2	Disclosed Tax Planning – disintegrated as per IAS12
TP3	Undisclosed Tax planning
TP4	Total Tax Planning
TPYAD	Tax on Prior Year Adjustments

TRC	Tax on Research Credits
TTP	Taxable Total Profits
TUNC	Tax on Uncategorised items
UK	United Kingdom
UKTCT	Total current tax in the UK
UKTDT	Total deferred tax in the UK
UNC	Uncategorised items
US	United States
VIF	Variance Inflation Factor
W_EXP	Work Experience of the board members
WDA	Writing Down Allowance
YEAR_DUM	Year Dummies

CHAPTER 1

INTRODUCTION

1.1 Background

Tax is paid by members of a society to contribute their share towards vital functions within society. While any tax collections are revenues for the tax authorities, they are expenses for taxpayers. Tax liability is calculated after deducting allowable expenses from the total profits, and these allowed expenses and reliefs are not always clearly picked up and understood by all taxpayers. In the UK HM Revenue and Customs (HMRC) defines tax planning as the efficient and effective use of any tax allowable expenses and reliefs to reduce the final tax liability (HMRC 2020). Some individuals, businesses and corporations often appoint professional experts to use the most efficient and effective tax planning activities. The tax-related income of the top 100 accountancy firms makes up 29% of their total income: this is the second highest component of their total income, after the 32% attributed to audit fees (AccountancyAge 2016). In contrast to audit fees, tax-related fees mostly represent optional additional services taken by firms to plan their tax activities.

Multinational enterprises (MNEs) have recently been under the media spotlight because of their lower-than-expected tax contributions. Examples are Amazon, Google and Starbucks, which faced public criticism for paying low taxes on their UK revenues (Financial Times 2012). This may have led to the scrutiny of corporate tax policies by various official investigations: for example, Google's tax deal was scrutinised by the Public Accounts Committee (PAC) in the UK (Google's tax deal

scrutinised 2016). Firms can reduce their taxes through tax planning and have been engaging in tax planning activities for a long time using various tax planning strategies and regimes.¹ These tax planning activities are considered as one of the main reasons for the difference between the expected tax collections and the actual tax receipts, potentially leading to a reduction of funds available for public spending (HMRC 2016b).

Moreover, tax scandals involving firms and the ensuing media attention have led to increasing public awareness of listed firms' tax policies. The demand for strict governance on tax matters increased in line with the overall demand for improvements in corporate governance following the Enron scandal in 2001. Tax-relevant disclosures became mandatory in the EU (IAS 12)² and the US (FIN 48)³ in 2005 and 2006, respectively, supporting the demand for further tax disclosures. The Organisation of Economic Cooperation and Development (OECD) initiated the Base Erosion Profit Shifting (BEPS) Action Plan to prevent MNEs from taking advantage of any variations in the tax laws of different countries (OECD 2013).⁴ However, tax collections from UK large firms are still less than expected as reported by HMRC (2020) as the 'tax gap' between the expected and actual tax collections. This tax gap has not reduced in monetary terms even with continuous reductions in corporation tax rates in the UK

¹ For a review on the use of tax planning strategies, see Hanlon and Heitzman 2010.

² International Accounting Standard 12 'income tax' has been adopted in the EU since 1st January 2005 and requires listed firms to provide a reconciliation between their nominal tax expense based on the statutory tax rate and the tax expense actually reported in the income statement for each period.

³ Financial Accounting Standards Board Interpretation 48 requires firms to analyse and report income tax risks.

⁴ Base Erosion and Profit Shifting (BEPS) refers to all those tax planning activities adopted by firms to take advantage of any loopholes and differences between taxation rules to make their taxable profits disappear within a single tax regime or shift their profits to locations with low or no taxes. The BEPS Action Plan launched by the OECD contains fifteen actions that target any venues and opportunities available to the firms to engage in BEPS and unfairly engage in tax planning (OECD 2013).

since 2010 (OECD 2019). It is therefore important to study firms' incentives for tax planning that persist despite these regulations and their market valuation.

However, such study is difficult, as information disclosed by firms on their tax returns is unavailable for tax research due to its confidential nature, which may further provide incentives for managers to seek private benefits from tax planning (Abdul Wahab and Holland 2012). Hence, previous research offered agency issues as potential explanations for tax planning: for example, managers could use tax savings for ventures other than maximising shareholders' wealth.⁵ With the increasing public interest and the involvement of national (HMRC) and international (OECD) regulators in tax planning, studying the wider influences of external institutions and a firm's response to these influences beyond an agency framework may bring useful contributions to the current tax planning literature.

1.2 Motivation

A wide range of US-based research has used the Effective Tax Rate (ETR) and Cash ETR to measure and study tax planning activities of firms (Desai and Dharmapala 2006; Dyreng et al. 2008; Armstrong et al. 2012). Similarly, for UK-based research, Holland (1998) uses Effective Tax Rate (ETR) to measure corporate tax burdens for UK firms. However, studying ETR or cash ETR movements on their own is not relevant as they are expected to decrease with the decreasing Statutory Tax Rates (STRs) as in the UK since 2010. The STRs in the US and previously in the UK have remained fixed, and hence, were used by the above researchers. The main limitation of these

⁵ For reviews, see Hanlon and Heitzman 2010; Wilde and Wilson 2018

measures is that they cannot provide details on any specific tax planning activities used by the firms.

In contrast, the income tax reconciliation disclosed under IAS 12 may provide additional information regarding tax planning activities adopted by a firm in the post-financial crisis developments.⁶ This reconciliation may include items disclosing tax implications of prior years' tax adjustments and deferred tax adjustments made in the current year, tax implications of loss reliefs claimed in the current year and tax implications of foreign profits earned in the current year that led the current year's tax expense. These items are in addition to the usual tax-relevant items disclosed in the reconciliation, such as R&D credits and permanent differences between accounting and tax profits. These items indicate a firm's engagement in specific tax planning activities leading to these differences disclosed in the reconciliation.

The main motivations for the current study are firstly, to propose a comprehensive measure of tax planning strategies and analyse firms' consistency of using these strategies, benefiting from the extended disclosures under IAS 12, which reveals further details on tax planning strategies adopted by UK firms; secondly, to study UK firms' incentives for tax planning and its value relevance in the post-financial-crisis period of financial constraints and financial distress (Edwards et al. 2016) with contraction of credit for firms (Vithessonthi and Tongurai 2015); and thirdly, to study the impact of wider institutional governance mechanisms in the UK beyond an agency

⁶ Following the 2005 adoption of the International Financial Reporting Standards (IFRS) in the EU and the tax expense disclosures required by IAS 12 'income tax', further opportunities to study tax planning became available. IAS12 requires firms to now disclose a reconciliation between the statutory tax rate (STR) applicable to the firm and the ETR reported in the financial statements (IASB 2010).

theory framework, as desired by Kovermann and Velte (2019). Each of these motivations is a contribution to the tax planning literature and addresses a research gap in the UK context.

1.3 Thesis overview and contributions

The present study contains three analytical chapters, each structured around a core research area in corporate tax planning in the UK. Since the adoption of International Accounting Standards (IAS) in the EU in 2005, the mandatory tax disclosures under IAS12 provide unprecedented tax related disclosures in financial statements. These disclosures are not available in any database and can only be collected manually from the financial statements. The present study manually collects and analyses these disclosures for 1482 firm-years. Moreover, the study covers the post-financial crisis period (2010 to 2015), which saw many economics reliefs for business, including the corporate tax rate reductions in the UK. In addition to the overall contributions, the current study specific contributions are detailed in the following sections.

1.3.1 Consistency of Tax Planning Strategies Adopted by Firms

The first analytical chapter provides a detailed literature review of the tax planning measurement techniques and then proposes a new tax planning measurement strategy – undisclosed tax planning. This measure addresses the previously neglected aspect of tax planning in the accounting literature. Furthermore, to measure tax planning, this chapter uses IAS 12 income tax, to analyse tax planning activities adopted by all LSE-listed UK domiciled non-financial firms between 2010 and 2015. In the absence of access to the firms' tax returns, tax reconciliation provides further disclosures about the tax planning strategies (collectively measured as 'disclosed tax

planning'), unlike using the overall ETR as the main tax planning measures. This research employs dynamic panel-data analyses to estimate the consistency of the tax planning strategies in the post-financial crisis period. That period experienced continuous reduction in UK corporation tax rate as well as a growing public awareness towards the tax avoidance practices of some leading multinational organisations (e.g., Google, Apple and Starbucks). Abdul Wahab and Holland (2015) have previously studied persistence of tax-book differences over a shorter sample period in the UK. However, the present thesis defines eight tax planning strategies using IAS 12 disclosures and estimates firms' consistency of using these strategies in the UK.

This research further uses the difference between ETR and Cash ETR as its second measure of tax planning (hereafter 'undisclosed tax planning') and the difference between STR and Cash ETR as the third measure of tax planning (hereafter 'total tax planning'). The tax reconciliation data disclosed as per IAS 12 of 262 firms for 1,482 accounting periods is manually collected to generate a unique dataset on income tax disclosures which is not previously done to this scale for any UK based study. Abdul Wahab and Holland (2012) use the same source but defined only tax planning strategies while I have analysed tax planning disclosures data in further detail to identify eight strategies.

1.3.2 Tax Planning Incentives for UK Firms and their Value Relevance

Secondly, the current study argues that signalling can explain tax planning and to analyse tax planning incentives and their value relevance in a signalling theory framework, this research analyses and compares the tax planning strategies of domestic and internationally oriented firms. MNEs can take advantage of lower tax

rates in overseas tax regimes by shifting their profits from a high tax regime, resulting in tax benefits for the MNEs at the cost of lower tax revenues for the country of origin. Analysing further incentives for tax planning, this research focusses on the impact of risk, free cashflow and growth on tax planning in the post-financial-crisis period. The 2008 financial crisis imposed constraints on the availability of corporate funds (Vithessonthi and Tongurai 2015), and this may have given further incentives for firms to engage in tax planning activities to generate internal funds that are not subject to any external credit checks.

The existing tax planning literature mainly studies tax planning in agency theory context (Wilde and Wilson 2018). The present study is conducted in a signalling theory framework to widen the scope of the existing literature on tax planning. Additionally, the tax planning incentives studied by the present research (international orientation, risk, free cashflows and growth) have not been previously studied. These are original contributions of the present study. Furthermore, the impact of value relevance of tax planning has been studied previously (e.g., Desai and Dharmaplala 2009; Abdul Wahab and Holland 2012) but the theoretical framework and research design used in the present study are unique and original.

For tax planning incentives, this research finds that internationally oriented UK firms are involved in less total tax planning and on average pay taxes in excess of the STR in the UK. However, these firms engage positively in disclosed tax planning activities, reducing their ETR to report higher after-tax earnings, but then pay more taxes in cash in excess of the STR by engaging negatively in undisclosed tax planning. This research finds no significant relationship between tax planning and risk, measured as share price volatility, free cashflows and firms pursuing growth,

measured as market to book ratio. These findings suggest that risky firms, firms with free cashflows and growth firms do not engage in tax planning to signal their behaviour and prevent any bad reputation associated with tax planning. This research finds a negative association between total tax planning activities and firm value, suggesting that these activities deteriorate shareholders' value. Interestingly, the research finds that this result is driven by 'disclosed tax planning' activities and that 'undisclosed tax planning' activities do not seem to have a negative effect on share value.

The research has practical implications and suggestions from its signalling theory settings. Firstly, it provides evidence for tax authorities which can contribute to promote market awareness about the financial implications of firms' overall tax planning activities on the economy. Publishing reports on the overall impact of tax planning activities and running public awareness campaigns may maintain the negative valuation of these activities by the market, which indirectly may restrict firms' engagement in tax planning as advocated by signalling theory and the present study's findings. Secondly, the findings suggest that the market does not consider the role of undisclosed tax planning activities in isolation from the total tax planning activities in its evaluation of a firm's market value. Undisclosed tax planning may appear as mere timing differences between tax expenses and tax payments however it indicates firms' use of tax planning to manage its cashflows and arrange short-term funds. Thirdly, to reduce the information asymmetry associated with the identified tax planning activities, firms should disclose more tax planning relevant information.

1.3.3 Impact of Corporate Governance on Tax Planning

Thirdly, this research studies the impact of external corporate governance mechanisms on firms' tax planning activities. Drawing its framework from the forces identified by institutional theory (Scott 2013), the current study identifies the relevant external institutional influences on corporate governance mechanisms of a firm that may impact its tax planning activities. The current study makes original contribution to the existing tax planning literature by structuring the research in an institutional theory framework. The corporate governance mechanisms interact with each other and substitute or complement each other (Weir et al. 2002; Baber et al. 2012) hence, the strength of governance in place in each firm may influence the impact of external institutional forces. This interaction between external and internal governance mechanisms has not been studied previously; and this is an original contribution of the present study to the existing tax planning literature. To study this influence, this research further analyses the impact of corporate governance mechanisms on strongly governed and weakly governed firms, making this distinction between the firms based on the board efficiency in line with Elshandidy and Neri (2015).

The external institutional factors as part of the institutional framework used in this research include: the directors' affiliations with tax institutions (Taylor and Richardson 2014), their previous tax experience (Law and Mills 2017), their accountancy qualifications (Dyreg et al. 2010), Auditor-Provided Tax Services (APTS) (Baber et al. 2012) and institutional ownership (Armstrong et al. 2015). This framework is unique to the tax planning literature in the UK and aims to address the research gap identified by Kovermann and Velte (2019).

Finally, for external institutional impacts on tax planning, this research finds that strongly governed firms with tax affiliated directors on the board engage more in tax

planning, paying taxes below their Statutory Tax Rate (STR), while weakly governed firms report lower tax expenses in their income statements. Furthermore, weakly governed firms with members with professional accountancy qualifications on the board pay taxes in excess of their STR. These findings provide the first evidence of its kind for the professional tax institutions about their affiliates' supportive role in tax planning.

Furthermore, this research finds a significant negative association between Auditors Provided Tax Services (APTS) and tax planning for all firms and no significant associated for strongly governed firms, suggesting that auditors' role in moderating tax planning is not significant when internal governance of their clients is strong. This finding confirms that governance mechanisms interact with each other, as suggested by Baber et al. (2012) and Weir et al. (2002), and in this case, APTS supplement the internal governance quality. This research finds that institutional ownership significantly reduces tax planning in line with the existing literature (Khurana and Moser 2013; Bradshaw et al. 2019), and this negative association is significant for strongly governed firms. These findings suggest that institutional control significantly complements tax planning in the presence of the internal governance quality, confirming Weir et al.'s (2002) suggestion of interaction between governance mechanisms.

The research has further practical implications from the institutional theory settings for the tax authorities: firstly, this research identifies key tax expertise of a board that could be used by HMRC for an initial assessment to select or ignore firms for further tax audits. This may help HMRC to better allocate its resources (NAO 2020). Secondly, the supplementary role of APTS to the internal governance quality provides

evidence for HMRC to encourage the use of APTS for weakly governed firms to reduce firms' tax planning activities. This research's findings are also relevant for management in maintaining the board composition with desired tax expertise by having tax affiliates on the board and engaging auditors for APTS in a strongly governed environment to save tax expenses and reduce tax payments.

1.4 Thesis Structure

This thesis consists of three independently structured empirical papers: Chapters 2, 3 and 4. Each Chapter addresses distinctive research questions and contributes to tax planning research in the UK using distinct analyses of unique datasets.

Chapter 2 analyses the tax planning measures used in the existing literature and develops a tax planning measure for specific tax planning strategies as per IAS 12 income tax disclosures for non-financial UK domiciled firms listed on the London Stock Exchange. The chapter employs dynamic panel-data estimation to establish firms' consistent engagement in specific tax planning strategies, with the objective to reduce their tax expenses.

Chapter 3 analyses incentives for tax planning and its value relevance for firms. Focusing on the post-financial crisis period, this chapter addresses research questions on the relevance of tax planning for internationally oriented firms, risk-facing firms, free-cashflow of firms and growth firms. Furthermore, this chapter explores the value relevance of tax planning for these firms.

Chapter 4 studies the impact of corporate governance on the tax planning activities of these firms in an institutional theory context. This chapter studies the

impact of three external governance pillars on tax planning. These pillars are defined in line with institutional theory and include the board members' professional affiliations, expertise and education; auditors' fees for tax services; and institutional control.

Chapter 5 concludes the thesis with overall findings from the analytical chapters. Practical implications of these findings are given followed by any limitations of the study and areas for future research.

CHAPTER 2

DO FIRMS CONSISTENTLY ENGAGE IN TAX PLANNING STRATEGIES?

2.1 Introduction

This chapter reviews the tax planning measures used in the literature and proposes a new tax planning measure that explores the tax planning aspects of firms that are previously not studied. The chapter further studies tax planning strategies using the hand-collected tax disclosures data from the annual reports of UK domiciled listed firms. The time period for the current study (2010-2015) experiences a continuous decrease in the corporation tax rates in the UK that may have resulted in changes in firms' tax planning strategies. Hence, this chapter also analyses the consistency of tax planning strategies adopted by the firms over the time. The findings in this chapter provide evidence for HMRC to motivate firms to report more profits in the UK to take advantage of the decreasing corporation tax rates. The rest of this section introduces tax planning and the research gaps addressed in the following sections of this chapter.

Tax is paid by members of a society to contribute their share towards vital functions within society. While any tax collections are revenues for the tax authorities, they are expenses for taxpayers. Tax liability is calculated after deducting allowable expenses from the total profits. These allowed expenses and reliefs are not always clearly picked up and understood by all taxpayers. Efficient and effective use of these expenses and reliefs is referred to as 'tax planning'. Tax planning can be defined as the use of legitimate measures and means to reduce the tax liability of a taxpayer. Any reduction in tax liability is a reward for the knowledge and expertise employed to

reduce the tax bill. This chapter specifically addresses tax planning strategies adopted by listed firms in the UK.

Tax planning collectively refers to all those activities undertaken by taxpayers to reduce their tax payable to the tax authorities. These tax-reducing activities are undertaken by the taxpayers in their personal capacity or may involve appointing professional tax consultants where the latter situation leads to agency problems. Any reduction in tax payments would result a positive cash flow and hence potentially be welcomed by businesses. However, shareholders' responses to any tax planning activities conducted by their agents (i.e. managers) are not always positive. After every tax year, HMRC publishes a report comparing the total estimated theoretical tax liability that was expected to be collected for that tax year with total tax collections – the difference is referred to as a tax gap (HMRC 2016). HMRC considers corporate tax planning as one of the main reasons for the corporation tax gap. This tax gap could result from tax planning, tax avoidance or tax evasion, and only the latter is illegal.⁷ This therefore means that firms are legally able to adopt any tax planning and tax avoidance strategies to manage their tax liabilities.

Tax evasion refers to any tax planning activities having aggressive engagements to reduce tax payments (Hanlon and Heitzman 2010) and there is a negative connotation attached to this term (Wilde and Wilson 2018). Similarly, tax avoidance refers to tax planning activities yielding above-average tax savings (Armstrong et al. 2012). Hence, tax evasion and tax avoidance studies will exclude tax

⁷ HMRC describes tax avoidance as “exploiting the tax rules to gain a tax advantage that Parliament never intended” (HMRC 2020).

planning activities commonly used by all taxpayers (e.g., capital allowances) and will only focus on aggressive and above-average tax planning activities, respectively. Some tax evasion activities may involve manipulating accounts and concealing facts to reduce tax payments. Such activities are often not picked up from the financial statement disclosures and hence, this is a limitation of a tax planning research relying on the disclosures (Abdul Wahab and Holland 2012). In line with Wilde and Wilson (2018), the present study focusses on the broader and neutral term namely, tax planning.

The theoretical tax liability computed by HMRC takes account of any tax planning available to firms – for example, tax credits and allowances – and yet there is always an overall tax gap as well as a tax gap specific to the corporation tax. This means that companies adopt tax planning strategies beyond those that HMRC considered, while calculating the theoretical tax liabilities: for example, a company could have invested in R&D and claimed R&D credits, or may have exercised group loss relief options. Tax planning activities are not only exercised in-house by the management but also outsourced via accountancy firms which specialise in tax planning strategies and are still used by firms despite charging heavily for their consultancy fees (AccountancyAge 2016). These accountancy firms specialise in tax planning and accumulated knowledge from all their clients, and are able to advise some ‘out of the box’ strategies that HMRC may not have considered while computing the tax gap (Abdul Wahab and Holland 2012).

Tax planning is also important for managers in relation to their performance appraisals, as net profits mostly used for management incentives are based on after-tax earnings for example, earnings per share. Hence, the amount of tax liability and

timings of payments of tax bills could be important for any management incentive definitions and computations.

Previous studies in this area have focussed on analysing incentives for tax planning (Minnick and Noga 2010; Armstrong et al. 2012) and tax avoidance (Armstrong et al. 2015) in relation to firm value and tax planning strategies adopted by listed firms (Desai and Dharmapala 2006; Abdul Wahab and Holland 2012). These studies have used different methods to measure tax planning and tax avoidance, including ETR, Cash ETR (CETR) and comparison of these with the industry average. While others have used IAS12 'income tax' disclosures to obtain further details on any specific tax planning strategies adopted by these firms. However, previous studies have not aimed to identify specific tax planning strategies adopted by listed firms and have studied tax planning as the total financial outcome.⁸ Also, measurement of any changes in firms' engagement in these tax planning strategies over time has not been addressed by previous research. In the context of reducing corporation tax rates in the UK since 2010 (OECD 2019), any changes in tax planning strategies may reveal further evidence on managerial preferences and incentives for tax planning. Any reductions in the overseas tax expenses over the period may indicate a shift of the taxable profits to the UK to avail the benefits from the lower tax rates.

This chapter aims to fill the above-mentioned research gap using the tax reconciliations disclosed as per IAS 12 to analyse tax planning activities adopted by all LSE listed non-financial firms between 2010 and 2015. The tax reconciliations data

⁸ For a review, see Hanlon and Heitzman 2010.

of 262 firms for 1,482 accounting periods is manually collected to generate a unique dataset on income tax disclosures. The data collected covers a period that experienced a continuous reduction in UK corporation tax rate as well as a growing public awareness towards the tax avoidance practices of some leading multinational organisations (e.g., Google, Apple and Starbucks). Descriptive analysis and dynamic panel-data estimation are used to assess the consistency and significance of each tax planning strategy disclosed in the income tax reconciliation.

The tax reconciliation starts with the nominal tax expense that is calculated at the statutory tax rate applied on the profit before tax reported in the income statement. This nominal tax charge is then adjusted for all items, causing it to increase or decrease, so that the tax expense reported in the income statements is attained. These items usually include disallowed expenses or R&D credits that respectively increase or reduce the nominal tax expense. Moreover, these items may relate to operating, investing or financing activities, providing evidence for any difference between the nominal tax charge and the tax expense reported in the income statement.

This chapter finds that firms in the outer quartiles of the profitability distribution are more engaged in tax planning and firms in the first quartile engage the most in tax planning. The chapter further finds that firms use prior-year tax adjustments and deferred tax adjustments as their main tax planning strategies to reduce their tax expenses however, prior-year tax adjustments have not been consistently used over the sample period. Firms consistently engage in all other tax planning strategies disclosed under IAS 12 income tax reconciliation. Over the time, these disclosures have improved with fewer items in the reconciliation disclosed as “other items”. This

improvement can be associated with the continuous reduction in the tax rates which may have reduced the firms needs to engage in the tax planning activities previously disclosed as “other items”. Finally, this chapter finds evidences that despite the reductions in the corporation tax rates in the UK, firms’ overseas profits have not reduced which indicates that the firms’ may have not shifted their profits to the UK to take advantage of the decreasing tax rates. This finding is supported by HMRC’s tax gap analysis, which shows a constant tax gap in corporation tax collections in monetary terms (HMRC 2016b)

The income tax reconciliations show reduction in tax expenses due to reduction in deferred tax liabilities. Moreover, investment in overseas subsidiaries, associates and joint ventures appears as a key component of tax planning techniques. Finally, the current study sets the foundation and key parameters to further study the impacts of any internal or external factors (e.g., corporate governance) on tax planning.

This chapter begins with a literature review of tax planning research in Section 2, followed by the rationale for conducting this research and its contributions to the existing literature. Research methodology and sample selection are discussed in Section 3, leading to the descriptive analyses of tax planning activities in Section 4. Finally, a conclusion is drawn based on the descriptive analysis in Section 5.

2.2 Literature Review

Tax research is a matter of interest in wider academic areas of economics, finance and accounting due to its inter-disciplinary nature. The tax research in accounting until the mid-1980s had mainly focussed on legal studies and research on policy matters and it did not attract wider research interests in accounting (Shackelford and Shevlin

2001). Despite some attention to tax matters in corporate finance research (e.g., Modigliani and Miller 1963), tax research in accounting was limited. The current tax research in accounting can be traced back to the fundamental research framework developed by Scholes and Wolfson in the 1980s, combining microeconomics and the finance perspective on taxation.⁹ Various members of society, individuals or businesses, are connected with taxation directly or indirectly, providing potential areas of tax research.

Corporate tax research evolved through different phases motivated by various public interests and addressing any research gaps. Due to the corporate scandals (e.g., Enron) and media attention towards corporate tax matters (e.g., Google tax arrangements), tax disclosure is mandated (e.g., IAS 12; FIN 48; BEPS Action Plan). Following the framework developed by Scholes et al. (2014), tax research in accounting can be divided into three categories. The first category studies the association between tax expenses reported by firms and their association with various firm characteristics (e.g., Gupta and Newberry 1997; Holland 1998; Mills and Newberry 2001; Kraft 2014). The second category focusses on the management role in corporate tax matters (e.g., Rego 2003; Rego and Wilson 2012). Finally, the third category studies the impact of various internal and external governance mechanisms on tax matters (e.g., Desai and Dharmapala 2009; Armstrong et al. 2012; Klassen et al. 2016).

⁹ For a review, see Shackelford and Shevlin 2001.

The core issue for tax research in the second or third category using any research framework is to determine the scope of management involvement in tax matters, as this leads to various terms used in the literature, such as tax planning, tax management, tax avoidance, aggressive tax planning and aggressive tax avoidance.¹⁰ Wilde and Wilson (2018) argue that tax planning is the most appropriate term to use for firms' activities to reduce their tax burdens, as it focusses on the activities adopted by the firms and not only on the outcome of any such activities. Researchers have adopted different approaches to measure tax planning and its relationships with various firm characteristics. These approaches attempt to estimate and measure tax planning in the absence of sufficient taxation-related disclosures in the financial statements. Tax returns submitted to HMRC are not reported publicly and hence only the financial statements' disclosures are available to measure any tax planning activities.

One of the most commonly used tax planning measures is through the comparison of the Effective Tax Rate (ETR) with the Statutory Tax Rate (STR). A smaller ETR means better tax planning: hence, movement in a firm's ETR over time may explain the firm's engagement in tax planning (Holland 1998; Desai and Dharmapala 2009; Armstrong et al. 2015). Another commonly used tax planning measure compares the STR with cash ETR. Cash ETR is measured as the actual tax paid, as a percentage of the firm's profit before tax (Gallemore and Labro 2015). While ETR considers the tax expenses reported in the Income Statement, the cash ETR fully measures the tax planning benefits and it also considers the time value of money

¹⁰ For a review of the various terms and their measures, see Hanlon and Heitzman 2010.

associated with tax payment delays. But the difference between ETR and STR is also described by the literature as a measure of tax avoidance (and not as tax planning): for example, Armstrong et al. (2015) compare firms' cash ETR with the industry average cash ETR to calculate the firms' tax avoidance. A criticism of this approach could be, that this measure is comparative but not absolute because the industry cash ETR used as a benchmark may already include a certain level of tax avoidance. Any tax avoidance commonly used by the entire industry would not be measured at all, as this approach focusses only on the difference in tax avoidance and not on total tax avoidance. Moreover, considering the overall ETR of a company would not reveal anything about further deconstruction of this ETR to study permanent, temporary and foreign tax differences (and others if needed: e.g., R&D allowances).

Dyreng et al. (2008) use long-term ETR to measure tax avoidance. They use ETR calculated as the five-year ratio of tax liabilities divided by profit before tax. This was estimated on a rolling basis to avoid any sudden impacts of one-off incidents that would probably not be part of tax planning strategy. This approach eliminates timing differences on payments for the tax liabilities. The authors claim that, their measurement of long-term ETR would consider both better tax planning strategies and the exploitation of any grey areas of legislation, and hence they use the term 'tax avoidance' instead of 'tax planning'. One of the main limitations of using ETR or even cash ETR to measure tax planning, or tax avoidance, is that both of these measures consider global tax liability at a group level. This limitation would not undermine any group level research but is not suitable for any studies at an individual firm level for any subsidiary firms that are part of a group. This is because of the obvious tax implications of any intra-group transfers of resources, which would be even more

critical in the case of cross-border movement of resources for multinational enterprises (MNEs).

Taxation-related disclosure requirements differ between the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB), with the former being less strict and more flexible while the latter requires disclosure of the uncertain tax benefits under FASB Interpretation Number (FIN) 48.¹¹ IASB has no equivalent disclosure requirement, and taxation disclosures, under IASB, are limited to a reconciliation, under International Accounting Standard (IAS) 12, of notional tax liability of a firm based on the STR and the taxation expense actually reported in the Income Statement (IASB 2010). Moreover, prior to the adoption of the IASB in the EU in 2005, there were no such requirements set by the Financial Reporting Council (FRC). While FIN 48 can provide very useful evaluation of a firm's attitude and approach towards tax avoidance, such information is not available for any non-US tax regime.

As indicated above, one of the limitations of using ETR to measure tax planning is its inability to provide details on possible tax planning strategies adopted by firms; hence the need for alternative tax planning measures. The income tax reconciliation as per IAS 12 discloses items accounting for the difference between the reported pre-tax profits and the taxable income: that is, the Book-Tax Difference (BTD). This reconciliation may bring a unique contribution to the UK-relevant tax planning literature, as evidence from other markets is not applicable to UK firms due to various

¹¹ Firms are required to disclose any benefits that the management consider might be payable to the taxation authorities in case of a taxation audit (FASB 2016).

differences in the taxation regulations. Moreover, with this approach, it is now possible to explore any areas of tax avoidance or 'out of the box' tax planning strategies adopted by firms while disregarding more obvious taxation timing differences. Nevertheless, this approach still does not allow consideration of all tax planning behaviours that a firm may have adopted. This is mainly due to the inherent limitation of analysing any management disclosures where information might not be disclosed completely, or different categories of tax planning might be presented as aggregated amounts. As an example, some differences in the IAS12 reconciliation are shown as 'other differences', revealing no details of the actual items causing these differences. The IAS 12 requirements do not further specify any specific categories that must be included within the taxation reconciliation.

BTDs have been used to study any possible relationship between accruals in the financial statements with the next period's accounting earnings by Hanlon (2005) and Chen et al. (2012). For tax planning and tax avoidance research, BTDs can be disaggregated to two main components, namely permanent differences (PD) and temporary differences (TD) that exist between accounting income and taxable income (Dyregang et al. 2008; Tang and Firth 2011).

PDs result from tax management strategies adopted by firms, as they represent core differences between accounting and taxation treatments of items in the income statement, such as income included in the income statement but exempt from tax or expenses shown in the income statement but not allowable for tax purposes (Frank et al. 2009; Wilson 2009). TDs result from temporary differences between the treatment of any items in the income statement and their treatment for tax purposes. In the long term, these differences tend to zero; however, they are still important from a tax

planning perspective, as they result in delaying any tax payments. Also, these differences are always recurring: that is, there will always be some TDs (Shackelford et al. 2011).

One problem with using BTDs as a measure of tax planning is that BTDs can arise from the earning management policies adopted by a company. PDs would arise in this case (Hanlon and Slemrod 2009) but it is also possible that companies are willing to pay relevant tax on their managed earnings to earn some market credibility, in which case no BTD will arise because of the application of any earnings management policies (Erickson et al. 2004).

An important observation possible with IAS 12 reconciliation is the tax implication which arises from the difference in the statutory tax rate (STRD) between a company's home country and any foreign countries' profits or losses. This observation has important implications not only for the understanding of tax planning but also for macro-economic decision-making. Different governments have collaborated on relevant forums to promote transparent and fair transfer of resources across countries to stop tax avoidance (OECD 2013) and suggest that the statutory tax rate differences could indicate tax planning strategies adopted in this area.

Abdul Wahab and Holland (2015) study PDs, TDs and STRDs, using as a measure of STRDs the difference between foreign tax rates and the UK tax rate. They conclude that PDs between reported accounting profits and taxable profits include disallowed expenses as well as non-taxable accounting income. Their finding regarding TDs showed low persistence and they explain it as a rolling effect of positive and negative impact of timing differences, which would cancel each other out.

Moreover, they do not consider the benefits associated with delaying any tax liability arising from these timing differences and they disregard the possibility of any earnings management leading to these temporary differences. A possible explanation for the persistence of STRDs could be the higher tax rates in the UK until 2009 – i.e. 30% (OECD 2019) – and the greater incentives for larger companies to declare profits in foreign countries with smaller corporation tax rates. However, as the corporation tax rate reduced rapidly thereafter to 20% in 2015, further research in this area would reveal how companies respond to this reduction in terms of their tax planning strategies.

Another approach used to measure tax planning is the consideration of the Differed Tax (DT) disclosures, which only reveal the amount of tax that is accrued in the current period as deferred tax payable in a later period – as the DT element of total tax liability never reduces to zero, this can be considered as a permanent difference. A problem with this measure is that DT disclosure is limited and may not reveal further details in terms of the tax planning strategies adopted.

A key area to consider for any corporate tax planning study is any possibility of tax evasion, which comprises criminal activities leading to non-reporting or incorrect reporting of taxable income. Any tax evasion activities would undermine computation of tax planning data, irrespective of which method is used, and hence it is important to exclude the impact of any tax evasion activities or incorporate any suitable control for these. Desai and Dharmapala (2009) rely on S&P 500 index, claiming that this prestigious rating is far more important and valuable for management to maintain, rather than losing it due to involvements in any tax evasion activities.

Abdul Wahab and Holland (2012) base their sample on listed companies reporting continuous profit, arguing that these companies would have more to lose in terms of their market value as compared with any possible benefits from involvement in any tax evasion activities; however, they acknowledge the limitations of their measure of tax planning, and hence justify their use of the more generic term 'tax planning' instead of 'corporate tax avoidance'. There are several reasons why including loss-making companies might be important for tax planning analysis: first, with loss relief options available to companies, the loss declared in the financial statements could actually be part of a tax planning strategy being pursued by the management. Second, the group loss declared in the financial statements could be due to a certain loss-reporting segment or/and could be a one-off exceptional item, which may well be part of a well-thought-out tax planning strategy. Moreover, analysis of any occasionally loss-making companies could reveal more on tax planning strategies and may contribute additional dimensions to any findings from profit-making companies only.

2.3 Research Methodology

2.3.1 Sample selection

My initial sample consists of non-financial firms that remained listed on the London Stock Exchange between 2010 and 2015.¹² Any firms delisted during the sample period are excluded from the sample for all years. This sampling strategy introduces

¹² Financial firms are subject to different financial and taxation regulations and thus are excluded from the analysis.

survivorship bias but at the same time it provides a balanced set of panel data of firms with consistent motivation to engage in tax planning. Moreover, delisted firms actively trading are not included in the sample as they are not obliged anymore to disclose tax planning information under IAS 12. Firms that were not active partially during the sample period were excluded from the sample to have a balanced representation of firms' in each sample year. This is important to capture impact of decreasing tax rates on firms' tax planning strategies which might be biased by the inclusion of these firms' tax planning activities partially during the sample period.

Mills et al. (1998) argued that consistently profit-making firms are expected to have stronger incentives towards tax planning and thus only considered those firms in their research. However, a rational decision-maker would not let any tax saving opportunity go, even when reporting loss for a particular accounting period. In fact, any losses before taxation charge shown in the income statement are subject to adjustments to get taxable profits or losses, which are then taxed using appropriate corporation tax rates or allowed to get appropriate tax reliefs, respectively. These adjustments may well convert accounting loss to taxable profit and vice versa.

Hence, the panel dataset in this research includes firms with up to three years of pre-tax losses. Due to lack of information in the tax reconciliation disclosure, it is not possible to measure the tax planning for firms with losses for the entire period, thus, these firms are excluded. Tables 2.1 and 2.2 summarise the sample selection of the 338 non-financial firms that were listed on the LSE for the entire sample period. After eliminating any firms with missing financial statements for one or more years, the total sample is 262 firms, as presented in Table 2.1 Panel B. In total, 177 firms reported profits for the entire period while 42, 21, 10, 7, and 3 firms reported profits for 5, 4, 3,

2, and 1 year, respectively. Two firms reported losses for the entire period. Due to the small number of firms reporting losses for the entire period, it was not possible to explore any firm-specific characteristics of these firms, and hence these firms are excluded from the sample. Table 2.1 Panel C presents total firm-years sampled, excluding any firm-years with extreme ETRs and cash ETRs.¹³ These firm-years are presented over the Industry Classification Benchmark (ICB) in Table 2.2.

¹³ ETR and Cash ETR values > 1 and < -1 are considered extreme as these values are cannot result from any normal tax planning strategies. Including these observations would influence the statistical analyses.

Table 2.1 Sample selection process

Panel A presents the number of firms that remained listed throughout the period and whose financial data is also accessible. Panel B further splits the firms based on the number of years for which these firms reported profits. Panel C presents the total number of firm years available after excluding any years with extreme Effective Tax Rate (ETR >1 or ETR <-1) and Cash Effective Tax Rate (CETR >1 or CETR <-1). Similar to Panel B, Panel C data is split into rows based on the number of years with profits out of the total sample years of six.

Panel A	
Description	Number of firms
All listed non-financial companies for 2010-2015	338
Found in Bloomberg	301
Complete financial statements available for the period	<u>262</u>

Panel B			
Periods reporting profit before tax:	Number of firms	% in sample	Cum. %
6	177	67.56	67.56
5	42	16.03	83.59
4	21	8.02	91.60
3	10	3.82	95.42
2	7	2.67	98.09
1	3	1.15	99.24
0	2	0.76	100.00
Total	<u>262</u>	100	

Panel C			
Periods reporting profit before tax:	Firm years	% in sample	Cum. %
6	1,043	70.00	70.00
5	223	14.97	84.97
4	109	7.32	92.28
3	52	3.49	95.77
2	37	2.48	98.26
1	15	1.01	99.26
0	11	0.74	100.00
Total	<u>1,482</u>	100	

Table 2.2 Industry spread of the total sample firm years

This table presents the sample spread over Industry Classification Benchmark (ICB industry) classifications.

ICB Industry	Number of firm years	% in sample	Cum.%
Basic Materials	90	6.04	6.04
Consumer Goods	211	14.16	20.20
Consumer Services	331	22.62	42.82
Health Care	80	5.37	48.19
Industrials	565	37.99	86.17
Oil & Gas	60	4.03	90.20
Technology	76	5.17	95.37
Telecommunications	27	1.81	97.18
Utilities	42	2.82	100.00
Total	1,482	100	

2.3.2 Research Design

Understanding the reporting of corporate tax expenses is important. Figure 2.1 explains the process and stages involved in income tax calculations and reporting in the financial statements. Income tax expenses comprise current period income tax expenses, which are calculated based on the adjusted taxable profits for the period and the deferred tax recognised, in addition to the current tax expense in accordance with the prudence concept. Hence, working back from the current tax reported in the income statement, taxable profits for a specific period can be different from the pre-tax earnings reported in the income statement.

In the present study, current and deferred income taxes are analysed to measure the actual expenses related to the current period's taxable profits and any income tax expenses recognised in advance. Since corporation tax rates in the UK were decreasing over the sample period, it is important to note that any deferred income tax expenses recognised in the income statement will actually result in a small tax payment in future. Deferred tax expenses are shown in the income statement for any temporary differences between the taxable profits and accounting profits. For example, for an asset with useful life of 10 years and depreciation at a straight-line basis, due to the difference between accounting depreciation (e.g., 10%) and capital allowances (tax depreciation: e.g., 25%), there would be less taxable profits in the first four years of the useful life of an asset but more taxable profits for the next six years. However, total expenses allowed under tax and accounting rules are the same over the period of 10 years. The difference in taxable amount caused by the different depreciation rates is a temporary difference which balances off over the useful economic life of the asset. In this scenario, IAS 12 requires firms to recognise deferred

tax expense over the first four years of the useful economic life of the asset to cancel the effect of the reduction in taxable profits due to higher tax expense being allowed: i.e. at 25%. The deferred tax amount is calculated by applying the current year's statutory tax rate to the difference between the accounting expenses recognised and tax expense allowed: that is, accounting depreciation at 10% minus capital allowances at 25%. The deferred tax charged for the first four years of the useful economic life of the asset is recognised as an expense in the relevant year and a corresponding liability is recognised to complete the double entry. So, these calculations result in a build-up of deferred tax liability for the first four years, which is then reversed over the following six years. However, as the statutory corporation tax rates have been reducing, the deferred tax expenses charged and the corresponding liabilities recognised would both be at a higher statutory rate in the first four years as compared to the statutory tax rate used to compute the tax expense for the latter six years of the useful economic life of the asset. Therefore, this research expects firms to show tax savings under the deferred tax adjustments heading.

Another important analysis of tax expense reported in the income statement is to separate local tax expenses from any foreign tax expenses recognised in the income statement. These local and foreign income tax expenses can further be analysed into current and deferred income tax expenses reported locally as well as current and deferred tax expenses reported overseas. Hence, the deferred taxation analysis explained above can be done separately for local and overseas taxes.

Small corporations in the UK pay their taxes nine months and one day after the end of their accounting period, while large corporations are required to pay their

income taxes in advance on an instalment basis.¹⁴ The first instalment is due on 14th day of the seventh month of the current accounting period and from then onwards three quarterly instalments are due. Hence, the first two instalments are paid within the previous accounting period income tax liability and the subsequent two instalments, are paid during the following accounting period. The final payment will result in the (re)payment of any balance. The third instalment paid in the following accounting period is included in the tax payments of the current year following the provisions of IAS 10.¹⁵ Hence, only the final balancing tax payment is included in the following accounting period creating a partial lag of the tax payments.

Thus, three equations can be derived to explain the income tax expenses reported in the income statement.

Income Tax Expense = Current Income Tax Expenses + Deferred Income Tax Expense

$$\text{ITE} = \text{CITE} + \text{DITE} \quad (1)$$

Income Tax Expense = Local Income Tax Expense + Foreign Income Tax Expense

¹⁴ Firms with taxable profits of over £1.5m are considered large for income tax payment requirements and this threshold is scaled down by the number of firms in a group (HMRC 2007b). So, for a group with one subsidiary (local or overseas), the threshold becomes £0.75m.

¹⁵ IAS 10 'Events After Balance Sheet Date': requires entities to adjust any events occurring after the balance sheet date that provide further evidence on an item present on the balance sheet date. Payment of the third tax instalment is further information on the tax liability present on the balance sheet date which must be adjusted within the financial statements of the accounting period it relates to.

$$\text{ITE} = \text{LITE} + \text{FITE} \quad (2)$$

Income Tax Expense = Local Current Income Tax Expense + Local Deferred Income Tax Expense + Foreign Current Income Tax Expenses + Foreign Deferred Income Tax Expense

$$\text{ITE} = \text{LCITE} + \text{LDITE} + \text{FCITE} + \text{FDITE} \quad (3)$$

The taxation system in the UK runs parallel to the corporate reporting structure, with many services shared between Companies House and HMRC. There are various differences in the recognition of income and expenses between the taxation system and accounting conventions. It is normal practice among businesses to set their books according to the accounting conventions and then adjust the final accounts to produce a tax adjusted version that is used to compute any income tax payable (or reclaimable). As corporate taxation is computed at the end of an accounting period and the tax payment dates are set to allow for any necessary adjustments needed to get the tax adjusted figures, the actual payment may entirely or partially fall within the following accounting period, depending on whether a firm is a large firm or otherwise. Figure 2.1 explains the taxation system, its interaction with the financial reporting system and how it relates to this research. Figure 2.1 explains all tax-related information and calculations.

Some important observations on this flowchart are firstly, that tax expenses reported in the income statement are not a simple calculation in which the Profit Before Tax (PBT) reported in an income statement is multiplied by the statutory tax rate. There are some adjustments involved to convert PBT into Taxable Total Profits (TTP). Secondly, the tax liability that is payable to HMRC is reported in the income statement,

along with any deferred tax. So, the income tax expense reported in the income statement comprises the current year's tax liability and any deferred tax amount. Thirdly, if a firm deals in a foreign currency, the current year's income tax liability and any deferred tax could be further split between local and overseas amounts. Finally, the current year's tax liability is different from any income tax payments reported in the cash flow statement in the same accounting period.

Data analysed in this research	Corporate taxation process flow chart	Explanation
	Earnings before interest and tax ↓	EBIT is mostly used in performance evaluation and other decision-making models.
	Pre-tax Earnings ↓	Income tax expense is not calculated on this figure in reality.
Difference between statutory tax rate and ETR is used to measure Book-Tax Difference (BTD) in taxation terms	Nominal corporation tax ↓	The reporting entity (parent company) uses the statutory corporation tax rate of the country
These adjustments are used to estimate different components of tax planning	Adjustments ↓	Tax impact of such adjustments is disclosed in the notes to the Financial Statements section of an annual report
ETR compared with Cash ETR and industry average ETR are used as measures of tax planning.	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">Current year's tax liability</div> <div style="text-align: center;">Deferred tax</div> </div>	Income tax expense recognised in the Income Statement is used to calculate ETR
Proportion of local and foreign tax analysed to segregate tax planning in local and foreign tax regimes.	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">Local</div> <div style="text-align: center;">Foreign</div> <div style="text-align: center;">Local</div> <div style="text-align: center;">Foreign</div> </div>	
Cash paid for income taxes is used to calculate Cash ETR, and this, in comparison with industry average, is used as a measure of tax	Income tax paid (Reported in the Cashflow Statement)	This is the real cash outflow for payment of income taxes to the tax authorities

Figure 2.1. Corporate Taxation Flowchart

The figure shows the corporate taxation process flow chart in the middle column. The column on the left highlights the process analysed in this research, while the column on the right provides an explanation of all key stages in the process.

2.4 Tax Planning Analysis

This section defines three tax planning measures based on the literature review conducted in Section 2 and the research design discussed in Section 3.2. A set of univariate analyses is conducted on these tax planning measures with respect to various firm characteristics used in the tax planning literature.

2.4.1 Tax Planning Measurement

Different tax planning measures can be used, as discussed previously in the literature review section.¹⁶ To understand the relationship of these tax planning measures with other financial characteristics of a firm, it is important to understand how a tax planning measure is formulated. Figure 2.2 is designed to explain different tax planning measures used in this research and how these different measures relate to each other. The segregation of tax planning into disclosed tax planning (TP1) and undisclosed tax planning (TP3) classifications is unique to this research: hence, Figure 2.2 sets out a very important explanation that is central to this research. Disclosed tax planning (TP1) is calculated by simply comparing the STR with the ETR, and this reflects how firms are able to report different rates of tax as compared to the statutory tax rates. Tax planning 2 (TP2) also measures the difference between the statutory tax rate and ETR, but this is further disintegrated into its components, as disclosed in the income tax reconciliation reported as per IAS12. Undisclosed tax planning (TP3) measures the

¹⁶ For a review on tax planning measures, see Hanlon and Heitzman 2010.

difference between ETR and CETR: that is, the difference between the reported income tax expense and the actual cash payments for the tax.

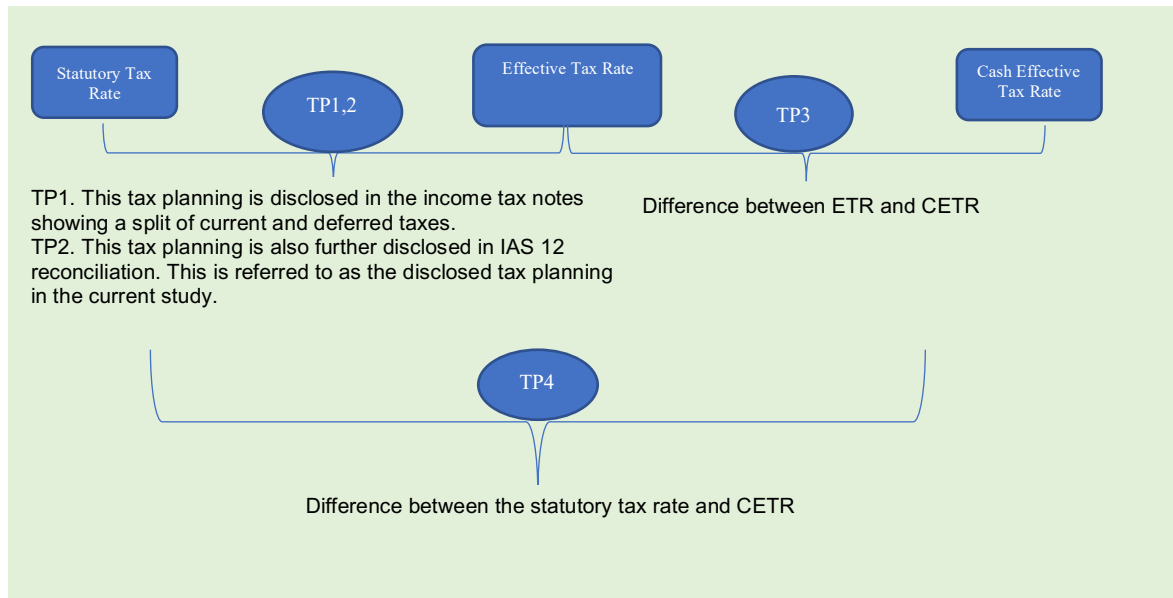


Figure 2.2. Different Tax Planning Measurements Used

Different Tax Planning Measurements used in the research. Disclosed tax planning is expressed as tp1 and tp2, where tp2 provides further details on components of disclosed tax planning using the income tax reconciliation.

2.4.1.1 Tax Planning Equations

Tax-related disclosures made in financial statements can help to capture the tax planning aspects reported as presented in Figure 2.2. The tax planning measures can be presented in equation form to understand the connection between these measures.

Disclosed tax planning (TP1) is calculated as below:

Disclosed tax planning is measured as TP1:

$$TP1 (\%) = \text{Statutory Tax Rate} - \text{Effective Tax Rate}$$

$$TP1 (\%) = STR - ETR \quad (4)$$

$$TP1 (£) = \text{Nominal Tax Expenses} - \text{Tax Expenses}$$

A further detailed disclosed tax planning is measured as TP2, which is equal to TP1 but greater detail on its components (see Table 2.3) are disclosed in the Income Tax disclosures as per IAS 12:

$$TP2 = TPD + TLR + TOSTRD + TRC + TPYAD + TDTAD + TJV + TUNC \quad (5)$$

Tax adjustments included in the tax return submitted to the tax authorities, like CT600 submitted to HMRC, contain further tax planning components, but these are not publicly disclosed. This undisclosed tax planning, where only the final amount is reported in the financial statements, without any computational details, is measured as TP3:

$$TP3 (\text{£}) = \text{Tax Expenses} - \text{Cash Paid for Expenses}$$

$$TP3(\%) = \text{ETR} - \text{CETR} \quad (6)$$

Finally, the overall tax planning is measured as TP4:

$$TP4 (\text{£}) = \text{Nominal Tax Expense} - \text{Cash Paid for Taxes}$$

$$TP4 (\%) = \text{STR} - \text{CETR} \quad (7)$$

TP1 and TP4 calculations in Equations 4 and 7, compare the UK STR with a firm's ETR and CETR, respectively. The ETR and CETR calculations are calculated as the ratio of a firm's consolidated tax expenses and group tax payments to its consolidated profit before tax amounts, respectively. These consolidated foreign tax payments are computed at the foreign tax rates. Hence, comparing ETR and CETR with the UK STR are the tax planning measures with respect to the UK tax rates. Alternatively, using a weighted average STR for TP1 and TP4 calculations would have eliminated the effect of foreign tax rate differences from these tax planning measures.

However, the present study aims to measure the impact of foreign tax rate differences on tax planning, which is captured by TOSTRD in Equation 5 above.

Finally, this chapter applies Dynamic Panel-Data (DPD) estimations to study the relation between all measures of tax planning and their lagged values. This analysis is extended to estimate the relation of the disclosed tax planning strategies, as per IAS12, with their lagged values. The dataset used for this chapter has a short time frame (T) and a large number of companies (N): hence, the Generalised Method of Moments (GMM) estimator is used, as proposed by Blundell and Bond (1998). The research model can be presented as:

$$TP_{it} = \alpha TP_{it-1} + \sum_{n=1}^6 \beta_n YEAR_DUM_i + \varepsilon_{it} \quad (8)$$

2.4.2 Descriptive Statistics

This section includes the descriptive statistics of the tax planning variables employed in the current study to highlight the descriptive trends in tax planning activities based on the tax planning measures used in this chapter. Eight of these variables are derived from the income tax reconciliation reported by firms as per IAS 12 and they are the components of 'disclosed tax planning'. Table 2.3 provides definitions and brief explanations of these variables derived from the reconciliation. The descriptive statistics of all variable are presented in Table 2.4 and a list of these variables with their brief descriptions is provided in Table 2.5. The descriptive analysis aims to explain different variables comprising disclosed, undisclosed and total tax planning and analysing financial characteristics of firms engaged in these forms of tax planning.

The total tax expense in Table 2.4 Panel A, with a mean of 19.10 (SD 18.76), is lower than the nominal tax on the accounting profit of 20.37 (SD 15.06), leading to mean disclosed tax planning of 1.28 (SD 17.93). The disintegrated components of disclosed tax planning as per IAS 12 show that the 'permanent differences' between accounting and taxable profits results an average increase of 3.51 (SD 15.16) in the reported tax expense. The only other item resulting in an increase in the reported tax expense is the 'overseas tax rate difference' with an average increase of 0.91 (SD 7.53). Tax on loss relief difference does not have any impact on the tax expense with an average of 0.00 (SD 10.54). The remaining five components of 'disclosed tax planning' namely, 'uncategorised tax differences', 'research credits difference', 'prior year tax adjustments', 'deferred tax adjustments' and 'joint venture tax difference' reduce the nominal tax on average by -0.71 (SD 12.92), -1.01 (SD 6.06), -2.46 (SD 7.73), -1.19 (SD 11.02) and -0.33 (SD 2.33), respectively.

The above observations from Panel A suggest that the prior year tax adjustments and the deferred tax adjustments are the main tax planning strategies resulting in the tax expense reduction. Unlike, the 'research credit differences' and 'joint venture differences', the prior year and deferred adjustments do not reveal further details about the activities that firms may have undertaken to reduce their tax expenses. However, the deferred tax adjustments can be associated with the decreasing tax rates leading to a reduction in the deferred tax liability.

The undisclosed tax planning is -1.14 (SD 20.61) in Panel B, showing tax payments in excess of the tax expenses disclosed. However, even with these excessive tax payments, the overall tax planning of 0.13 (20.74) shows tax saved by the firms on average as compared with the nominal tax. The local current tax expense

is 14.56 (SD 18.94) which is reduced by the local deferred tax of -2.42 (SD 19.03) resulting in the local total tax expense of 12.14 (SD 20.41). Similarly, the overseas current tax expense of 7.07 (SD 12.61) is reduced the overseas deferred tax expense of -0.16 (SD 5.81) resulting in the overseas total tax expense of 6.90 (SD 12.61). The higher proportion of local deferred tax as compared to the overseas deferred tax may result in higher overall tax savings in the long-run due to the decreasing tax rates in the UK as any tax expense deferred in the current period is payable in the future at the future statutory tax rate. Variables further explaining these tax planning values are covered in the following sections.

Table 2.3 Description of tax planning variables

This table presents a brief description of the disclosed tax planning (TP2) variables that are based on the items disclosed in the income tax reconciliation as per IAS 12. The items disclosed vary from one firm to another due to differences in the nature of activities, impacting the reported income tax expenses.

	Items disclosed in the income tax reconciliation as per IAS 12
Tax on Permanent Difference (TPD)	This difference arises due to any permanent differences between accounting and tax values of earnings reported in the financial statements: for example, expenses not recognised by tax regulations or income not taxable by tax regulations. This difference might have a positive or a negative value.
Tax on Loss Relief (TLR)	This difference arises in cases when a firm uses its loss from a previous accounting period to be set against the current accounting period, hence reducing the tax expense for the current accounting period – known as trading loss relief for companies. This value would mostly be negative, explaining reduction in tax expense. However, very rarely, this value could be positive, resulting in an increase of taxation expense. This would happen when a firm decides not to claim a loss which is reported in the current period's financial statement.
Tax due to Overseas Tax Rate Difference (TOSTRD)	A firm trading internationally in whichever format may end up paying tax at overseas tax rate that might be lower or higher than the local tax rate. Hence this variable could have a positive or a negative value.
Tax on Research Credits (TRC)	This variable would result in reduction of tax expenses and would always have a negative value if any research credits are availed by a firm or otherwise would be absent.
Tax on Prior Years' Adjustments (TPYAD)	Accounting adjustment during a period in relation to previous periods may result in additional or reduced tax payments in the current year which is calculated by this difference. It is considered important to analyse the tax impact of such difference, as there is a saving on the time value of money in case of delay of tax payments from previous years.
Tax on Deferred Tax Adjustments (TDTAD)	These differences mainly arise because of the reductions in the corporation tax rates announced for the future tax year. As UK corporation tax rates have been declining throughout the sample period, any deferred tax recognised for future periods would reduce due to the reducing corporation tax rates, but any other revision in the deferred tax liability may increase the tax expense reported in the current tax year.
Tax on Joint Ventures (TJV)	This difference reported in the reconciliation measures the tax impact of any joint ventures during the period.
Tax on Uncategorised Items (TUNC)	This category reports any remaining differences in the reconciliation that are not included in any other category.

Table 2.4 Descriptive statistics

Panel A presents tax planning variables manually calculated from the income tax reconciliation reported in the notes to the financial statements as per IAS12. All variables in Panel A are presented as percentage of profit before tax. Tax on accounting profit is the nominal tax calculated by multiplying the relevant statutory tax rate with profit before tax reported in the income statement. Total tax expense calculated from the reconciliation is given next and the difference between the nominal tax expense and total income tax expense is explained by the rest of the variables given in Panel A. Any uncategorised differences (TUNC) that are items in the income tax reconciliation are either reported as uncategorised or could not be placed in any other category. Permanent differences (TPD) are expenses (income) reported in the income statement but not allowed (taxable) under the tax rules. Tax on loss relief (TLR) is tax saving due to claiming loss relief for any losses to be set against the current year's profits. Overseas tax rate differences (OSTRD) represent the tax impact of differences in the local (UK) tax rates and the foreign tax rates – the tax impact could be positive or negative. Research credit (TRC) differences represent any reductions in taxation due to tax credits awarded by the relevant tax authority. Prior year tax adjustment (PYTAD) represents any rectification of previous errors or other adjustments in previous periods' income tax expenses. Deferred tax adjustments (DTAD) are adjustments in tax that are recorded as deferred (i.e. payable in future), but need adjustment, for example to current and announced future tax rate reduction in the UK. Finally, any tax expense implications of joint venture (TJV) arrangements in the current period are presented. Panel B presents other tax planning variables calculated from Bloomberg. These include current and deferred tax split of the UK and overseas tax expenses. Statutory tax rate and effective tax rate are the same as nominal tax rate and total tax expense presented in Panel A, except that in Panel B these values are collected from Bloomberg. Effective tax rate is the total tax expense reported in a year, measured as a percentage of profit before tax for the relevant year. Similarly, cash ETR is cash paid for taxes, measured as a percentage of profit before tax. Disclosed tax planning is calculated as the difference between statutory tax rate and ETR, while undisclosed tax planning is measured as the difference between ETR and cash ETR. Both these forms of tax planning combined provide total tax planning.

Panel A – Tax planning variables from IAS12 income tax reconciliation					
Variable	N	Mean	Std. Dev.	Min	Max
Tax on Accounting Profit	1482	20.37	15.06	-63.98	62.57
Total Tax Expense	1482	19.10	18.76	-92.35	90.83
Uncategorised Tax Diff	1482	-0.71	12.92	-344.26	136.05
Permanent Diff	1482	3.51	15.16	-27.11	349.15
Tax on Loss Relief Diff	1482	0.00	10.54	-109.09	180.51
Overseas Tax Rate Difference	1482	0.91	7.53	-134.62	59.03
Research Credit Diff	1482	-1.01	6.06	-85.78	57.25
Prior Year Tax Adjustment	1482	-2.46	7.73	-101.33	58.67
Deferred Tax Adjustment	1482	-1.19	11.02	-214.86	88.14
Joint Venture Tax Diff	1482	-0.33	2.33	-29.30	23.00
Panel B - Other Tax Planning Variables					
Variable	N	Mean	Std. Dev.	Min	Max
UK Total Current Tax	1482	14.56	18.94	-145.33	171.43
UK Total Deferred Tax	1482	-2.42	19.03	-194.57	111.30
UK Total Tax Expense	1482	12.14	20.41	-142.39	157.14
Overseas Total Current Tax	1482	7.07	12.61	-26.89	101.50
Overseas Total Deferred Tax	1482	-0.16	5.81	-114.29	32.61
Overseas Total Tax Expense	1482	6.90	13.07	-71.43	107.61
Total Tax Expense	1482	19.04	18.83	-93.94	90.83
Statutory Tax Rate	1482	20.37	15.06	-63.98	62.57
Effective Tax Rate	1482	19.10	18.76	-92.35	90.83
Cash ETR	1482	20.24	17.30	-75.84	98.84
Disclosed Tax Planning	1482	1.28	17.93	-113.95	98.67
Undisclosed Tax Planning	1482	-1.14	20.61	-138.46	103.36
Total Tax Planning	1482	0.13	20.74	-126.74	98.66

Table 2.5 Description of key variables

Variable	Initial used	Description
TUNC	TUNC	Ratio of any uncategorised items to PBT
TPD	TPD	Ratio of tax on permanent differences to PBT
TLR	TLR	Ratio of tax on loss relief used to PBT
OSTRD	OSTRD	Ratio of overseas tax rate differences to PBT
TRC	TRC	Ratio of tax on any research credits given to PBT
PYTAD	PYTAD	Ratio of tax on prior years' tax adjustments to PBT
DTAD	DTAD	Ratio of tax on deferred tax adjustments to PBT
TJV	TJV	Ratio of tax on joint venture activities to PBT
UK Total Current Tax	UKTCT	Ration of local current tax to PBT
UK Total Deferred Tax	UKTDT	Ratio of local deferred tax to PBT
Overseas Total Current Tax	OSTCT	Ratio of current overseas tax to PBT
Overseas Total Deferred Tax	OSTDT	Ratio of overseas deferred tax to PBT
Strategic Tax Rate	STR	Ratio of average statutory tax rate to PBT
Effective Tax Rate	ETR	Ratio of reported tax expenses to PBT
Cash Effective Tax Rate	CETR	Ratio of cash paid for taxes to PBT
Tax Planning 1	TP1	Disclosed tax planning
Tax Planning 3	TP3	Undisclosed tax planning
Tax Planning 4	TP4	Total tax planning

2.4.3 Disclosed (TP1), Undisclosed (TP3) and Total (TP4) Tax Planning

Tables 2.6 and 2.7 present the descriptive data for disclosed (TP1), undisclosed (TP3) and total (TP4) tax planning. Table 2.6 contains data for firms reporting profits throughout the sample period and Table 2.7 reports data for firms reporting profits for at least three years. Each table further summarises data based on industry, year for the sample time period and over each quartile based on the firms' size – determined based on the sales revenue.

Table 2.6 Panel A provides details of these components of income tax expense for the firms reporting profits throughout the sample period. The average value of the industry disclosed tax planning is 2.52. Industrials have the largest value of disclosed tax planning, at 3.56, followed by telecommunications, at 3.53. Utilities have the lowest value, at -0.77. For the undisclosed tax planning, utilities have the largest average

value, at 6.46, and oil and gas the lowest, at -3.88. Total tax planning is highest for the industrials industry, with a mean of 5.87, and lowest for the health care industry, with a mean of -1.05. Utilities reporting the second highest total tax planning of 5.69 report the highest undisclosed and the lowest disclosed tax planning. This finding highlights the inverse combination of both these forms of tax planning at its extreme. Similarly, an inverse relation is evident in other industries too.

Panel B presents the average of the tax planning measures per year. Over the six-year period, tax planning has been reducing overall, reflected in the total downward trend from 7.93 in 2010 to -0.27 in 2015. This downward trend is also found in the disclosed tax planning, which falls from 2.82 to -0.65, and undisclosed planning, which falls from 5.11 to 0.38 over this period. This reduction reflects the fact that the statutory corporation tax rates have been declining in the UK since 2008. STR clearly shows that the average statutory tax rate has declined. This reflects that the firms have been maintaining a predetermined level of tax expenses that they are willing to pay each year, and despite the fact that the statutory tax rates have reduced, the firms did not reduce their acceptable tax expense limits. Hence, the gap between the statutory tax rate and the tax expenses – i.e. tax planning – has been reducing from 2010 to 2015. This observation is in line with the literature, which finds that firms maintain a targeted level of tax expenses (Scholes et al. 2014; Kim et al. 2019). The overseas tax payments shown in the OSTCT column remained constant at around 6 throughout the period, indicating that the profits declared overseas were not shifted to the UK to gain benefits from the reducing statutory tax rates. This observation is supported by HMRC's tax gap analysis, which shows a constant tax gap in corporation tax collections in monetary terms (HMRC 2016b).

Panel C presents the average of 'undisclosed tax planning' measures over four quartiles based on firms' size (sales revenue). Quartiles one and four show high disclosed tax planning, with means of 4.32 and 4.04, respectively, and quartile 2 shows a negative tax planning value of -0.55. The firms in quartile one, having comparatively lower taxable profits as compared to the other quartiles, would include new firms or firms recovering from losses in previous year, and hence eligible for certain new business reliefs or loss reliefs, respectively. Quartile four includes large firms with more resources available to invest in tax planning, and hence higher disclosed tax planning, but at the same time these firms showed negative undisclosed tax planning, meaning that they paid more tax than the tax expense they reported in the income statement: this could be a strategy to keep the tax man away or to be seen as responsible citizens. Finally, it can be concluded that all firms in all industries, for the entire period and in all quartiles, are engaged in tax planning, and hence are overall reporting less tax expenses in their income statements than the statutory tax rate and are paying even less than the tax expenses reported in the income statements.

Table 2.7 contains data for firms reporting profits for at least three years and shows that the mean disclosed tax planning is 1.67. Telecommunications present the largest mean disclosed tax planning value, at 3.65, and the utilities industry the lowest, at -2.91, as shown in Panel A of the table. The mean value for undisclosed tax planning is -0.79. Utilities present the largest mean disclosed tax planning value, at 3.69, and the oil and gas industry the lowest, at -11.98. The undisclosed tax planning, with an overall mean of -0.79, shows that firms on average are paying more tax than they are

reporting in their income statements. However, with the disclosed tax planning of 1.67, the overall reduction in the reported tax expense is 0.88.

Table 2.7 Panel B presents similar findings to Table 2.6 Panel B in terms of the reducing trend of both measures of tax planning: that is, the disclosed tax planning falls from 2.62 to -2.3 and the undisclosed tax planning drops from 2.74 to -3.23. This reduction is comparatively large and drops to negative tax planning, indicating that the tax expenses recognised and paid were increasing during this time period. The reason for this drop in tax planning is explained by the reduction of STR during the period. Cash ETR (CETR) shows an upward trend from 19.38 to 20.98, reflecting payments of tax exceeding the expenses recognised in the income statement. Because the income tax expenses recognised decreased during the period, as reflected by the reducing ETR from 22.12 to 17.75, the overall tax planning is positive for 2010 to 2013. As the STR continued to fall, positive total tax planning would have resulted in very low tax payments, which might not be good for firms due to bad publicity and risk of facing a possible tax investigation. Panel C presents the average of undisclosed tax planning measures over four quartiles based on firms' size (sales revenue). Quartile one shows the largest disclosed tax planning of 3.82, followed by quartile three with 2.11. Quartile three is the only quartile to show tax savings with both disclosed and undisclosed tax planning measures.

Comparing Tables 2.6 and 2.7, some important observations can be made regarding different approaches towards each type of tax planning. Both tables show reductions in disclosed and undisclosed tax planning from 2010 to 2015. Quarter one shows a larger mean value for disclosed tax planning and total tax planning for means of 4.32 and 4.42 in Table 2.6 and 3.82 and 2.66 in Table 2.7, respectively. It is

important to note that in both tables, firms in quartile three showed higher tax savings across all three categories of tax planning. Overall, the sample containing profit-making firms only (Table 2.6) shows comparatively higher tax planning. However, it cannot be concluded from this that loss-making firms are not engaged in any tax planning at all.

Table 2.6 Disclosed (TP1), undisclosed (TP3) and total tax planning (TP4): Firms reporting profits for all years

This table presents data only for the firms that reported profit throughout the sample period (i.e. 2010 to 2015). It presents tax planning variables in columns and reports these variables as percentage of profit before tax (PBT). The first column on Panel A presents the spread of firms as per ICB classification as given in Bloomberg. All TP1 measures the disclosed tax planning, which is calculated as the difference between Statutory Tax Rate (STR) and ETR, given in the third and second last columns respectively. TP3 presents the undisclosed tax planning which is the difference between ETR and Cash ETR (CETR) – CETR is given in the last column. TP4 presents the total tax planning, which is a combination of TP1 and TP3, or in other words, the difference between STR and CETR. Total local current tax expense (UKTCT) is presented next, which is the income tax reported for the relevant current year only, while any deferred income tax recognised for the future is presented as total local deferred tax UKTDT. Similarly, overseas total current tax and overseas total deferred tax are presented as OSTCT and OSTDT, respectively. This data on the local and overseas tax expenses is manually collected from financial statements. Panel B presents the same data over the sample period of six years (i.e. 2010-2015). Panel C presents the data over four quartiles that are set based on the firms' size. The firm size is set in line with the reported revenues by the firms and firms with lower revenues fall in quartile one. The bottom two rows on each column present the overall mean and SD of each variable.

Panel A										
ICB Industry	TP1	TP3	TP4	UKTCT	UKTDT	OSTCT	OSTDT	STR	ETR	CETR
Basic Materials	1.70	-0.09	1.61	14.63	-0.20	7.34	1.28	24.76	23.06	23.15
Consumer Goods	0.48	-0.69	-0.21	16.13	-2.38	10.12	-0.31	24.05	23.57	24.26
Consumer Service	2.43	1.59	4.02	16.05	0.08	6.64	-0.04	25.17	22.74	21.15
Health Care	2.53	-3.57	-1.05	17.94	-2.89	7.02	0.61	25.20	22.68	26.25
Industrials	3.56	2.30	5.87	16.60	-0.21	4.89	0.09	24.93	21.37	19.07
Oil & Gas	3.23	-3.88	-0.65	24.42	-3.99	0.76	0.00	24.37	21.13	25.01
Technology	3.20	-3.29	-0.10	25.29	-6.97	5.20	0.00	26.71	23.51	26.81
Telecom	3.53	0.87	4.39	13.27	1.54	6.04	0.00	24.37	20.84	19.97
Utilities	-0.77	6.46	5.69	10.99	4.03	8.91	1.07	24.21	24.99	18.52
Mean	2.52	1.04	3.55	16.69	-0.81	6.37	0.10	24.86	22.34	21.31
SD	13.35	16.16	15.23	17.14	13.37	10.80	4.53	4.42	13.66	14.89

Panel B										
T Series	TP1	TP3	TP4	UKTCT	UKTDT	OSTCT	OSTDT	STR	ETR	CETR
2010	2.82	5.11	7.93	17.78	0.88	6.48	0.49	28.39	25.57	20.46
2011	6.06	0.49	6.56	15.42	-0.94	6.58	0.24	27.44	21.37	20.88
2012	2.94	0.30	3.24	16.66	-0.23	5.90	0.26	25.52	22.58	22.28
2013	2.30	-0.33	1.97	17.52	-2.48	6.62	0.10	24.12	21.82	22.14
2014	1.56	0.23	1.79	15.94	-0.78	6.54	-0.53	22.67	21.12	20.88
2015	-0.65	0.38	-0.27	16.80	-1.32	6.09	0.00	20.92	21.57	21.19
Mean	2.52	1.04	3.55	16.69	-0.81	6.37	0.10	24.86	22.34	21.31
SD	13.35	16.16	15.23	17.14	13.37	10.80	4.53	4.42	13.66	14.89

Panel C										
Firm Size	TP1	TP3	TP4	UKTCT	UKTDT	OSTCT	OSTDT	STR	ETR	CETR
Q1	4.32	0.10	4.42	15.62	-1.52	6.67	0.14	25.26	20.94	20.84
Q2	-0.55	2.67	2.13	16.10	0.66	9.15	-0.42	24.98	25.53	22.86
Q3	2.57	1.39	3.96	17.27	-0.88	5.15	0.14	24.23	21.67	20.27
Q4	4.04	-0.22	3.82	17.43	-1.60	4.80	0.51	25.13	21.09	21.31
Mean	2.52	1.04	3.55	16.69	-0.81	6.37	0.10	24.86	22.34	21.31
SD	13.35	16.16	15.23	17.14	13.37	10.80	4.53	4.42	13.66	14.89

Table 2.7 Disclosed (TP1), undisclosed (TP3) and total tax planning (TP4): Firms reporting profits for at least three years

This table presents data for all those firms that reported profits before tax for at least any three years in the sample period (i.e. 2010 to 2015). It presents tax planning variables in columns and reports these variables as percentage of profit before tax (PBT). The first column in Panel A presents the spread of firms as per ICB classification, as given in Bloomberg. All TP1 measures the disclosed tax planning, which is calculated as the difference between Statutory Tax Rate (STR) and ETR, which are given in the third and second last columns respectively. TP3 presents the undisclosed tax planning, which is the difference between ETR and Cash ETR (CETR) – CETR is given in the last column. TP4 presents the total tax planning, which is a combination of TP1 and TP3, or in other words, the difference between STR and CETR. Total local current tax expense (UKTCT) is presented next, which is the income tax reported for the relevant current year only, while any deferred income tax recognised for the future is presented as total local deferred tax (UKTDT). Similarly, overseas total current tax and overseas total deferred tax are presented as OSTCT and OSTDT respectively. This data on the local and overseas tax expenses is manually collected from financial statements. Panel B presents the same data over the sample period of six years (i.e. 2010-2015). Panel C presents the data over four quartiles that are set based on the firms' size. The firm size is set in line with the reported revenues by the firms, and the firms with lower revenues fall in quartile one. The bottom two rows on each column present the overall mean and SD of each variable.

Panel A										
NICB Industry	TP1	TP3	TP4	UKTCT	UKTDT	OSTCT	OSTDT	STR	ETR	CETR
Basic Materials	-2.50	-1.61	-4.12	10.16	0.59	7.59	0.73	16.56	19.06	20.68
Consumer Goods	-0.64	0.59	-0.05	15.23	-1.70	9.75	-0.44	22.21	22.85	22.26
Consumer Service	3.07	-0.64	2.43	14.57	-2.00	6.81	-0.10	22.62	19.55	20.19
Health Care	3.18	-4.19	-1.01	14.59	-3.57	8.24	-0.25	22.19	19.01	23.20
Industrials	2.65	0.37	3.02	15.86	-1.87	5.95	-0.03	22.55	19.90	19.53
Oil & Gas	0.48	-11.98	-11.50	21.48	-12.62	8.49	0.36	18.15	17.67	29.65
Technology	0.52	-4.58	-4.06	19.07	-7.63	6.88	0.00	18.84	18.32	22.90
Telecom	3.65	-2.96	0.69	13.39	0.43	5.82	-0.17	23.12	19.46	22.42
Utilities	-2.91	3.69	0.79	12.94	2.09	9.89	0.19	22.19	25.10	21.41
Mean	1.67	-0.79	0.88	15.32	-2.32	7.15	-0.06	21.83	20.15	20.94
SD	17.06	20.33	20.48	18.51	19.06	12.61	4.97	12.89	17.60	17.12

Panel B										
T series	TP1	TP3	TP4	UKTCT	UKTDT	OSTCT	OSTDT	STR	ETR	CETR
2010	2.62	2.74	5.36	16.40	-1.53	7.11	0.18	24.73	22.12	19.38
2011	5.50	-0.42	5.07	13.50	-1.59	7.46	0.25	25.17	19.67	20.09
2012	2.53	0.21	2.74	15.51	-0.84	6.89	0.03	24.13	21.60	21.39
2013	0.74	-0.58	0.16	15.67	-2.25	7.14	0.17	21.85	21.11	21.69
2014	0.50	-3.60	-3.10	15.37	-3.82	7.82	-0.80	19.03	18.53	22.14
2015	-2.03	-3.23	-5.26	15.50	-4.01	6.44	-0.18	15.73	17.75	20.98
Mean	1.67	-0.79	0.88	15.32	-2.32	7.15	-0.06	21.83	20.15	20.94
SD	17.06	20.33	20.48	18.51	19.06	12.61	4.97	12.89	17.60	17.12

Panel C										
Size	TP1	TP3	TP4	UKTCT	UKTDT	OSTCT	OSTDT	STR	ETR	CETR
Q1	3.82	-1.16	2.66	13.11	-2.90	6.78	0.06	20.89	17.07	18.23
Q2	-0.86	-0.77	-1.63	16.73	-3.50	9.23	-0.53	21.32	22.18	22.95
Q3	2.11	0.05	2.16	15.92	-1.60	5.92	-0.09	22.25	20.15	20.09
Q4	1.93	-1.34	0.59	15.22	-1.37	6.61	0.34	22.70	20.77	22.12
Mean	1.67	-0.79	0.88	15.32	-2.32	7.15	-0.06	21.83	20.15	20.94
SD	17.06	20.33	20.48	18.51	19.06	12.61	4.97	12.89	17.60	17.12

2.4.4 Disintegrated Disclosed Tax Planning as per IAS 12 (TP2)

Using IAS 12 disclosures, tax planning is calculated as the difference between the nominal taxation charge, calculated using the statutory tax rate, and the actual taxation expense recognised in the income statement. It is important to restate here that any income not reported by a firm in its financial statements would be completely out of the scope of this research and would be sure to result in less tax expenses but would be clearly considered as tax evasion. The firms selected for this research are subject to statutory audit and are expected to lose more in terms of reduction in their market value due to bad publicity rather than getting any benefits from tax evasion. Tables 2.8 and 2.9 provide further details on the components of disclosed tax planning, as reported in the income tax reconciliation as per IAS12. TP2 is calculated independently from TP1 and hence serves as a countercheck on the computation of TP1.

Table 2.8 Panel A shows that the highest disclosed tax planning value of 3.56 for the industrials industry is associated with the tax difference of 2.44 for prior year tax adjustments shown in the column PYTAD. The prior year tax adjustments overall contributed 2.12 towards the total disclosed tax planning of 2.52. It is important to note that disclosed tax planning decreased due to permanent differences between accounting and tax regulations. The tax impact of these permanent differences has a total mean of 1.68, with means of over 2 for the consumer goods and consumer services industries. This reduction of disclosed tax planning is recovered by both these industries and they eventually reduce their reported tax expenses.

Panel B presents the average of the disclosed tax planning measures per year. Over the six years, the overseas tax rate differences shown in column OSTRD have

increased from 0.17 in 2010 to 2.04 in 2015. This shows that revenues declared overseas did not reduce throughout the sample period and this increase in overseas tax rate difference is due to the reduction in statutory tax rate. The uncategorised tax difference shown in the column TUNC reduced from 1.17 to 0.43 since 2010, showing improvements in firms' tax disclosures during the period, with firms reporting less tax-reducing activities as "others".

Panel C presents the average of the disclosed tax planning measures over four quartiles based on firms' size. The uncategorised tax differences of 1.16 in quartile one and 1.25 in quartile two are larger than those in other quartiles: this partially explains the higher disclosed tax planning in quartiles one and four, of 4.32 and 4.04 respectively. Similarly, tax saving due to the use of loss relief contributed towards the disclosed tax planning for quartiles one and four only, with mean tax savings of -0.41 and -0.45 respectively. This could be explained as use of previous years' loss relief by firms in quartile one and use of group relief by firms in quartile four. R&D credits are used in all quartiles to reduce the disclosed tax planning but are higher in quartile one, with a mean of 2.82, as shown in the column TRC: this could be because firms going through their research and development phase would have lower sales revenue and hence are included in quartile one.

Table 2.9 Panel A contains data for firms reporting profits for over two years and shows the mean disclosed tax planning of 1.67, which is the same as disclosed in Table 2.7. The highest disclosed tax planning of 3.65 for the telecommunications industry can be associated with the tax saving on loss relief of 2.06 and prior years' adjustments of 1.55. The lowest disclosed tax planning of 0.48 in the oil and gas industry can be associated with the unusual negative value for tax on loss relief of -

2.46, which means that for losses recognised in the income statement, no loss relief claims are made to reduce the income tax expenses. It is important to note that prior year adjustments and deferred tax adjustments are used by all industries to save tax.

Panel B presents the average of the disclosed tax planning measures over the time period and the findings are similar to Table 2.8 Panel B. Similarly, Panel C shows similar trends to that of Table 2.8 Panel C. As the overall disclosed tax saving is more for the firms reporting profit throughout the period, Table 2.8 shows higher values for variables as compared to Table 2.9. Firms in quartile two did not use any loss relief, and they show the highest tax impact of the permanent differences, which collectively resulted in increased tax expenses of -0.86 in this quartile.

Table 2.8 Disclosed tax planning (TP2) for firms reporting profits in all years

This table presents data only for the firms that reported profit throughout the sample period (i.e. 2010 to 2015). The variables presented in this table provide further explanation of disclosed tax planning, which is referred to here as TP2 in the first column (it is referred to as TP1 in Tables 4.4 and 4.5). Variables in columns are reported as percentage of profit before tax (PBT). The disclosed tax planning is calculated as the difference between STR and ETR given in the second and third data column, respectively. The rest of the eight variables explain this difference as per the income tax reconciliation disclosed under IAS12. The first variable from the reconciliation is the uncategorised differences (TUNC), which are those items of the income tax reconciliation that are either reported as uncategorised or could not be placed in any other category. Permanent differences (TPD) are items are expenses (income) reported in the income statement but not allowed (taxable) under the tax rules. Tax on loss relief (TLR) is tax saving due to claiming loss relief for any losses to be set against the current year's profits. Overseas tax rate differences (OSTRD) represent the tax impact of differences in the local (UK) tax rates and the foreign tax rates – the tax impact could be positive or negative. Research credit (TRC) differences represent any reductions in taxation due to tax credits awarded by the relevant tax authority. Prior year tax adjustment (PYTAD) represents any rectification of previous error or other adjustments in previous periods' income tax expenses. Deferred tax adjustments (DTAD) are adjustments in tax that is recorded as deferred (i.e. payable in future) but needs adjustment, for example, to current and announced future tax rate reduction in the UK. Finally, any tax expense implications of joint venture (TJV) arrangements in the current period are presented. Panel A presents the spread of firms as per ICB classification as given in Bloomberg. Panel B presents the same data over the sample period of six years (i.e. 2010-2015). Panel C presents the data over four quartiles that are set based on the firms' size. The firm size is set in line with the reported revenues by the firms and the firms with lower revenues fall in quartile one. The bottom two rows on each column present the overall mean and SD of each variable.

Panel A											
NICB Industry	TP2	STR	ETR	TUNC	TPD	TLR	OSTRD	TRC	PYTAD	DTAD	TJV
Basic Materials	-1.70	24.76	23.06	-0.81	-0.28	-0.24	1.63	0.00	-1.94	0.10	-0.17
Consumer Goods	-0.48	24.05	23.57	-1.53	2.10	-0.29	1.47	-0.06	-1.00	-0.51	-0.66
Consumer Service	-2.43	25.17	22.74	0.00	2.24	-0.43	1.01	-1.40	-2.46	-1.08	-0.31
Health Care	-2.53	25.20	22.68	-1.26	1.47	-0.77	-0.06	0.00	-2.47	0.56	0.01
Industrials	-3.56	24.93	21.37	-0.62	1.50	-0.09	0.66	-1.04	-2.44	-1.25	-0.28
Oil & Gas	-3.23	24.37	21.13	-0.43	1.98	0.62	1.09	0.00	-1.58	-4.92	0.00
Technology	-3.20	26.71	23.51	-0.75	2.12	2.41	1.45	0.00	-4.24	-2.90	-1.28
Telecom	-3.53	24.37	20.84	0.10	0.20	0.26	-1.33	-0.99	0.03	-0.68	-1.13
Utilities	0.77	24.21	24.99	-2.26	0.94	-0.50	3.48	0.00	-0.45	-0.59	0.15
Mean	-2.52	24.86	22.34	-0.72	1.68	-0.12	0.99	-0.76	-2.12	-1.10	-0.36
SD	13.35	4.42	13.66	6.51	8.08	5.00	4.55	5.40	6.68	5.47	1.56

Panel B											
T series	TP2	STR	ETR	TUNC	TPD	TLR	OSTRD	TRC	PYTAD	DTAD	TJV
2010	-2.82	28.39	25.57	-1.17	1.23	-0.04	0.17	-0.63	-1.98	-0.02	-0.40
2011	-6.06	27.44	21.37	-1.48	1.18	-0.23	0.39	-1.04	-3.22	-1.29	-0.37
2012	-2.94	25.52	22.58	-0.35	1.26	-0.09	0.98	-0.91	-1.62	-1.83	-0.38
2013	-2.30	24.12	21.82	-0.22	1.68	-0.10	1.01	-0.79	-1.77	-1.78	-0.33
2014	-1.56	22.67	21.12	-0.65	2.78	-0.72	1.36	-0.34	-2.40	-1.22	-0.38
2015	0.65	20.92	21.57	-0.43	1.94	0.47	2.04	-0.87	-1.75	-0.45	-0.31
Mean	-2.52	24.86	22.34	-0.72	1.68	-0.12	0.99	-0.76	-2.12	-1.10	-0.36
SD	13.35	4.42	13.66	6.51	8.08	5.00	4.55	5.40	6.68	5.47	1.56

Panel C											
Size	TP2	STR	ETR	TUNC	TPD	TLR	OSTRD	TRC	PYTAD	DTAD	TJV
Q1	-4.32	25.26	20.94	-1.16	1.84	-0.41	0.96	-2.82	-1.61	-0.95	-0.17
Q2	0.55	24.98	25.53	-0.41	1.88	0.29	1.91	-0.39	-2.40	-0.16	-0.18
Q3	-2.57	24.23	21.67	-0.19	1.45	0.03	0.81	-0.14	-2.44	-1.75	-0.34
Q4	-4.04	25.13	21.09	-1.25	1.59	-0.45	0.32	-0.23	-1.90	-1.41	-0.71
Mean	-2.52	24.86	22.34	-0.72	1.68	-0.12	0.99	-0.76	-2.12	-1.10	-0.36
SD	13.35	4.42	13.66	6.51	8.08	5.00	4.55	5.40	6.68	5.47	1.56

Table 2.9 Disclosed tax planning (TP2) for firms reporting profits for at least three years

This table presents data for all those firms that reported profits before tax for any three years, at least, within the sample period (i.e. 2010 to 2015). The variables presented in this table provide further explanation of disclosed tax planning, which is referred to here as TP2 in the first column (it is referred to as TP1 in Tables 4.4 and 4.5) variables in columns and the variables are reported as percentage of profit before tax (PBT). The disclosed tax planning is calculated as the difference between STR and ETR given in the second and third data columns, respectively. The rest of the eight variables explain this difference as per the income tax reconciliation disclosed under IAS12. The first variable from the reconciliation is the uncategorised differences (TUNC), which are those items of the income tax reconciliation that are either reported as uncategorised or could not be placed in any other category. Permanent differences (TPD) are expenses (income) reported in the income statement but not allowed (taxable) under the tax rules. Tax on loss relief (TLR) is tax saving due to claiming loss relief for any losses to be set against the current year's profits. Overseas tax rate differences (OSTRD) represent the tax impact of differences between the local (UK) tax rates and the foreign tax rates – this tax impact could be positive or negative. Research credit (TRC) differences represent any reductions in taxation due to tax credits awarded by the relevant tax authority. Prior year tax adjustment (PYTAD) represents any rectification of previous errors or other adjustments in previous periods' income tax expenses. Deferred tax adjustments (DTAD) are adjustments in tax that is recorded

as deferred (i.e. payable in future) but needs adjustment, for example to current and announced future tax rate reduction in the UK. Finally, any tax expense implications of joint venture (TJV) arrangement in the current period are presented. Panel A presents the spread of firms as per ICB classification as given in Bloomberg. Panel B presents the same data over the sample period of 6 years (i.e. 2010-2015). Panel C presents the data over four quartiles that are set based on the firms' size. The firm size is set in line with the reported revenues by the firms, and the firms with lower revenues fall in quartile one. The bottom two rows on each column present the overall mean and SD of each variable.

Panel A

NICB Industry	TP2	TUNC	TPD	TLR	OSTRD	TRC	PYTAD	DTAD	TJV	STR	ETR
Basic Materials	2.50	1.42	2.04	0.03	2.05	-0.22	-2.23	-0.12	-0.47	16.56	19.06
Consumer Goods	0.64	-1.45	3.14	-0.41	1.63	-0.28	-1.37	0.02	-0.63	22.21	22.85
Consumer Service	-3.07	0.35	3.28	-1.02	0.87	-1.41	-2.36	-2.37	-0.42	22.62	19.55
Health Care	-3.18	-1.83	5.67	-1.15	1.07	-1.93	-2.33	-2.50	-0.17	22.19	19.01
Industrials	-2.65	-0.32	2.82	-0.04	0.57	-0.89	-3.18	-1.40	-0.19	22.55	19.90
Oil & Gas	-0.48	-2.10	2.96	2.46	-0.21	-0.50	-1.13	-1.82	-0.16	18.15	17.67
Technology	-0.52	-0.08	5.42	0.81	2.23	-1.71	-3.77	-2.51	-0.91	18.84	18.32
Telecom	-3.65	-0.11	2.93	-2.06	-0.36	-0.66	-1.55	-0.68	-1.16	23.12	19.46
Utilities	2.91	-1.08	2.02	-0.43	2.97	0.00	-0.60	-0.11	0.13	22.19	25.10
Mean	-1.67	-0.38	3.18	-0.28	1.00	-0.93	-2.49	-1.41	-0.37	21.83	20.15
SD	17.06	8.51	12.25	8.32	7.57	5.49	7.76	10.48	1.75	12.89	17.60

Panel B

T series	TP2	TUNC	TPD	TLR	OSTRD	TRC	PYTAD	DTAD	TJV	STR	ETR
2010	-2.62	-0.96	2.97	-0.08	0.54	-1.14	-2.47	-1.09	-0.39	24.73	22.12
2011	-5.50	-0.98	1.81	-0.73	0.57	-0.93	-3.23	-1.63	-0.37	25.17	19.67
2012	-2.53	-0.26	2.91	-0.70	1.77	-0.96	-2.19	-2.73	-0.36	24.13	21.60
2013	-0.74	-0.42	3.10	0.16	1.50	-0.94	-2.41	-1.43	-0.29	21.85	21.11
2014	-0.50	-0.40	4.79	-0.89	0.79	-0.58	-2.90	-0.90	-0.43	19.03	18.53
2015	2.03	0.78	3.53	0.57	0.85	-1.01	-1.73	-0.61	-0.35	15.73	17.75
Mean	-1.67	-0.38	3.18	-0.28	1.00	-0.93	-2.49	-1.41	-0.37	21.83	20.15
SD	17.06	8.51	12.25	8.32	7.57	5.49	7.76	10.48	1.75	12.89	17.60

Panel C

Size	TP2	TUNC	TPD	TLR	OSTRD	TRC	PYTAD	DTAD	TJV	STR	ETR
Q1	-3.82	-0.38	3.46	-1.07	1.02	-2.95	-1.88	-1.88	-0.14	20.89	17.07
Q2	0.86	-0.18	4.50	0.27	1.50	-0.50	-3.02	-1.50	-0.21	21.32	22.18
Q3	-2.11	-0.52	2.36	-0.18	1.13	-0.32	-2.64	-1.68	-0.26	22.25	20.15
Q4	-1.93	-0.45	2.44	-0.26	0.37	-0.23	-2.35	-0.64	-0.81	22.70	20.77
Mean	-1.67	-0.38	3.18	-0.28	1.00	-0.93	-2.49	-1.41	-0.37	21.83	20.15
SD	17.06	8.51	12.25	8.32	7.57	5.49	7.76	10.48	1.75	12.89	17.60

2.4.5 Further Analysis: Dynamic Panel-Data Estimation

Time series estimations of the relationship between each of the three measures of tax planning and its one-period lagged value for the entire sample and for consistently profit-reporting firms are presented in Tables 2.10 and 2.11, respectively. The results for total tax planning (TP4), undisclosed tax planning (TP3), and disclosed tax planning (TP2) are presented in columns 1, 2 and 3, respectively, of Table 2.10 and 2.11. Similarly, the results for disclosed tax planning components uncategorised items (TUNC), permanent difference (TPD), prior year loss relief (TLR), overseas statutory tax rate difference (OSTRD), research credits (TRC), prior-year tax adjustment (PYTAD), deferred tax adjustments (DTAD) and joint ventures (TJV) are presented in columns 4 to 11, respectively, of Tables 2.10 and 2.11. For each of the estimations in both Tables, AR(2) errors are not significant as per the Arellano-Bond test and the instrument over-identification is not significant as per the Hansen test for all estimations except for TP4, TP2 and TRC for consistently profit-reporting firms reported in Table 2.11.

The overall sample results in Table 2.10 show that TP4 and TP3 have constant and significant (at 1% significance level) relationships with their respective lagged values, which is constant and significant (at 1% significance level) for TP2. The relationship is only positive for TP4, indicating a decline in use of TP2 and TP3 over the sample period, yet the total tax planning (TP4) has been on the rise over this period. Despite the decreasing statutory corporation tax rate in the UK over the sample period, firms have consistently engaged in total tax planning, paying taxes below the statutory tax rates. Consistent and significant (at 1% significance level) relationships

for uncategorised items (TUNC), overseas tax rate difference (OSTRD), research credits (TRC) and deferred tax adjustments (DTAD) indicate firms' frequent engagement in these tax planning strategies. The negative significant relationship for DTAD indicates a reduction in use of deferred tax adjustments due to the lower future corporation tax rates. Hence, an amount of deferred tax booked in a previous period is adjusted to a lower amount payable in a future accounting period due to the reducing statutory tax rates in the UK.

Table 2.11 shows that for consistently profit-reporting firms, TP4 and TP3 are consistently, significantly and positively (at 1% and 5% significance levels, respectively) related with their respective lagged values but are not significantly related to TP2. These findings confirm the findings from the summary statistics that profit-reporting firms engage more in tax planning. But, the present findings indicate that profit-reporting firms do not consistently and significantly engage in disclosed tax planning. Furthermore, the findings in columns 4 to 11 of the same table provide results for these firms' engagements in specific tax planning strategies. These findings indicate firms' consistent and significant (at 1% significance level) relationships with TUNC, TLR, OSTRD, TRC, DTAD, TJV and (at 10% significance level) TPD.

Overall, a common finding between the two sets of results in Tables 2.10 and 2.11 is the insignificant consistency in prior-year tax adjustments (PYTAD), which shows tax savings on average as reported in the descriptive analysis but is not found to be significantly consistent for either of the sub-samples. For the collective sample, research credit (TRC) is the most consistent and significant component (0.173^{***}) of the disclosed tax planning strategy. For the consistently profit-reporting sample,

permanent difference (TPD) is the most consistent and significant component (0.567*) of the disclosed tax planning strategy.

Table 2.10 Time series regression: all firms

The time series regression estimates the consistency of tax planning measures, the dependent variables, using the one-year lagged values of dependent variables as the independent variables. The regression model is used on the entire sample. The results for each estimate are presented in columns, starting with tax planning measures total tax planning (TP4), undisclosed tax planning (TP3) and disclosed tax planning (TP2), presented in columns 1, 2 and 3, respectively. Tax planning strategies derived from the income tax reconciliation disclosed as per IAS12 are estimated using the same regression model and the results are presented in columns 4 to 11. These tax planning strategies are defined as in Table 2.8.

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	TP4	TP3	TP2	TUNC	TPD	TLR	OSTRD	TRC	PYTAD	DTAD	TJV
Independent variable DV _(t-1)	0.002*** (15.974)	-0.001*** (-8.367)	-0.030* (-1.952)	0.032*** (5.037)	0.032* (1.661)	0.104* (1.871)	0.013*** (10.409)	0.173*** (119.331)	-0.001 (-0.071)	-0.015*** (-31.544)	0.142 (1.567)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F-statistics	258.800***	21.890***	66.110***	14.450***	3.334***	2.697**	32.470***	3566.400***	1.648	413.400***	1.978*
Observations	1233	1233	1233	1233	1233	1233	1233	1233	1233	1233	1233
Groups	261	261	261	261	261	261	261	261	261	261	261
Instruments	20	20	20	20	20	20	20	20	20	20	20
Arellano-Bond test (AR1)	-1.014	-1.010	-2.308**	-1.407	-1.723*	-1.500	-1.023	-1.414	-1.588	-1.104	-1.661*
Arellano-Bond test (AR2)	-0.650	-0.690	0.654	1.130	0.0107	0.706	-0.902	1.226	0.0610	-0.968	0.800
Hansen test	12.04	8.847	12.71	8.640	12.73	18.32	14.07	14.59	9.247	20.58	19.14

Table 2.11 Time series regression: profit-reporting firms

The same analysis as in Table 2.10 is conducted on profit-reporting firms only.

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	TP4	TP3	TP2	TUNC	TPD	TLR	OSTRD	TRC	PYTAD	DTAD	TJV
Independent variable DV _(t-1)	0.198*** (6.364)	0.091** (2.502)	0.036 (1.015)	0.121*** (15.824)	0.567* (1.723)	0.239*** (10.942)	0.070*** (6.274)	0.183*** (458.870)	-0.015 (-0.857)	0.300*** (21.521)	0.140*** (13.675)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	863	863	863	863	863	863	863	863	863	863	863
F-statistics	24.540***	3.739***	149.900***	50.510***	9.929***	23.660***	19.260***	199.909***	2.690**	88.960***	32.850***
Groups	176	176	176	176	176	176	176	176	176	176	176
Instruments	20	20	20	20	20	20	20	20	20	20	20
Arellano-Bond test (AR1)	-1.124	-2.671***	-1.098	-1.025	-1.601	-1.011	-1.941*	-0.998	-3.269***	-1.038	-1.208
Arellano-Bond test (AR2)	1.076	0.509	0.352	1.005	1.981	1.036	0.358	1.272	-0.961	1.033	1.147
Hansen test	20.47*	18.60	22.55**	16.81	18.36	12.06	17.32	104.8***	15.88	16.18	16.45

2.5. Conclusion

This chapter analyses tax planning for 1,490 firm years. This analysis tries to understand the relationship between different tax planning measures used in the literature. To measure tax planning, the current study uses the total tax planning and disclosed tax planning commonly used in the literature but also proposes a new tax planning measure: undisclosed tax planning. Undisclosed tax planning (TP3) highlights the differential of tax planning that can be associated with confidential tax planning activities not disclosed elsewhere in the financial statements. It can be argued that this tax measure is already part of the total tax planning measure used in the literature; however, analysing it separately allow for the study of the movements in undisclosed tax planning, in association with disclosed tax planning. The analyses in this chapter perform a comparative descriptive analysis of all three tax planning measures for consistently profit reporting firms and for firms reporting profit for at least three years. The analysis further uses dynamic panel-data regression to gauge the consistency of tax planning strategies disclosed under IAS 12.

The results show that tax planning is actively used by profit reporting firms and that loss reporting firms have fewer incentives to engage actively in tax planning. A possible explanation for this result is that, since these firms do not have to pay tax, they may not see the value of tax planning at the same level as conducted by the profit reporting firms. Although the benefits of tax planning can be carried forward and utilised to minimise any future tax expenses, any active tax planning activities consume resources which might not be justifiable by the firms reporting losses.

Both for firms that consistently report profits and for firms with more than two years' profits, higher tax planning is found at the outer quartiles of the firms' distribution based on size, which is in line with the research model used by Armstrong et al. (2012). Interestingly, among both the outer quartiles, tax planning is adopted more by the lower quartile, which shows that higher profits are not directly associated with higher tax planning. A possible explanation for this result is that firms in the fourth quartile are mostly under the spotlight in terms of their tax payments and their general social responsibility contributions, and hence their tax savings are not very high. Also, firms in the lower quartile may have used their losses from the previous years to reduce their current year's tax liabilities.

Smaller firms in the lower quartile reported lower ETR, resulting in higher disclosed tax planning. This is consistent with the fact that these firms are either reporting losses or reporting lower profits and thus have lower ETRs. Larger firms, in the upper quartile, reported comparatively higher TP1 than did those in the other three quartiles. Disclosing higher tax planning and hence having lower ETR means that these firms are able to report higher profits in their income statements, resulting in a positive impact on their financial performance. Since large firms should have more resources available to invest in tax planning and engage proactively in tax planning activities, they disclose more information confidently to their users in their financial statements. Conversely, smaller firms, in the second quartile, managed tax planning by disclosing less and reacting late on the tax planning activities: the second quartile is the only quartile with negative disclosed tax planning. On the other hand, since larger firms are expected to pay more tax, reputational damage or fears may impact

on their tax planning strategies. This seems to be confirmed by the negative undisclosed tax planning found for the large firms in the fourth quartile.

Local and overseas deferred tax expenses reduced the income tax expenses reported in the income statement. Deferred taxation in theory could increase or decrease the reported income tax expense, depending upon the net balance of deferred tax assets and deferred tax liabilities recognised in an accounting period. However, the sample shows that for all cases, the net deferred tax recognised resulted in reduction of reported tax expense.

Firms disclose some of their tax planning activities as 'other items' which contribute towards the disclosed tax planning. These uncategorised tax planning strategies decreased over the time with the decrease in tax rates. Prior year tax adjustment and deferred tax adjustments are the other main tax planning strategies used by firms. However, the prior year tax adjustments are not consistently used as a tax planning strategy as per the dynamic panel-data regression. All other tax planning strategies are consistently pursued by firms throughout the sample period.

An important limitation of the tax planning measure based on the information reported in the financial statements is the possibility that some tax planning activities might not be considered at all, as these activities might result in exclusion of income from both accounting and taxable income. The exclusion from the accounting income may or may not be as a direct result of any tax planning activities, but even so, in both cases, measures of tax planning would be incomplete. The only possible solution to prevent such exclusions is to conduct additional primary research, but as discussed

above, doing so would not be feasible and consistent with other research objectives that require larger sample sizes over a long period of time.

Another important limitation with respect to the tax planning measure is the inclusion of tax savings that are not directly resulting from any tax planning activities: for example Annual Investment Allowances (AIA), First Year Allowances (FYA), and Writing Down Allowances (WDA), which are mostly timing differences, but there could potentially be permanent differences, such as expenses not qualifying for tax purposes and hence impacting the tax planning calculations.

With the decreasing corporation tax rates, negative deferred taxation would eventually result in tax savings, as tax would actually be paid at lower rates in future. This is evident from the tax-reducing effect of deferred tax adjustment used by the sample firms in all quartiles. This is strong evidence to suggest a reduction in current and future tax collections of HMRC. Moreover, the constant overseas current tax (Table 2.6 & 2.7) indicates that overseas profits did not reduce over the sample period hence suggesting that overseas taxable profits did not shift to the UK to get advantage of the decreasing corporation tax rate. If the taxable profits reported or declared in the UK do not increase with time, this reduction in HMRC's revenue would have implications for current and future public spending – an area of further research to build upon the above-mentioned findings of the current study.

CHAPTER 3

TAX PLANNING INCENTIVES FOR UK FIRMS AND ITS VALUE RELEVANCE

3.1. Introduction

Multinational enterprises (MNEs) have recently been under the media spotlight because of their lower-than-expected tax contributions. Examples are Amazon, Google and Starbucks, which faced public criticism for paying low taxes on their UK revenues (Financial Times 2012). Due to the confidential nature of firms' tax matters, previous research offered agency issues as potential explanations for tax planning: for example, tax savings could be used by managers for ventures other than maximising shareholders' wealth and thus could be an indication of agency problems and hence valued negatively by shareholders (Desai and Dharmapala 2009; Abdul Wahab and Holland 2012; Armstrong et al. 2015). This chapter uses signalling theory framework to study firms' tax planning activities instead of an agency theory framework as the media and regulatory attention are additional monitors on managers' tax planning activities: hence, these might be better explained in line with signalling theory framework.

As discussed in Chapter 2, tax planning is mostly studied in the literature as an overall outcome with limited analyses of the strategies used to achieve this outcome. Income tax disclosures as per IAS 12 are analysed in this chapter to study the tax planning strategies pursued by the firms in relation to their tax planning incentives. The research design and theoretical framework used in this chapter help in

understanding a firm's tax planning engagements as a signal to improve firms' image in the market. This chapter further measures the impact of tax planning engagements of a firm on its market value. This chapter makes a number of contributions to the existing tax planning literature and its findings have important practical implications as highlighted below in this section.

Information disclosed by firms on their tax returns is unavailable for tax research due to its confidential nature. A wide range of US-based research has used the Effective Tax Rate (ETR) and Cash ETR to measure and study firms' taxation activities (Desai and Dharmapala 2006; Dyreng et al. 2008; Armstrong et al. 2012). Similarly, for UK-based research, Holland (1998) uses Effective Tax Rate (ETR) to measure corporate tax burdens for UK firms. The International Accounting Standard (IAS) 12 disclosure requirements provide opportunities that may reveal useful information regarding tax planning strategies adopted by firms in the post-financial crisis developments.¹⁷ This reconciliation may include items disclosing tax implications of prior years' tax adjustments and deferred tax adjustments made in the current year, tax implications of loss reliefs claimed in the current year and tax implications of foreign profits earned in the current year that led the current year's tax expense. These items are in addition to the usual tax-relevant items disclosed in the reconciliation, such as R&D credits and permanent differences between accounting and tax profits. These

¹⁷ Following the 2005 adoption of the International Financial Reporting Standards (IFRS) in the EU and the tax expense disclosures required by IAS 12 'income tax', further opportunities to study tax planning became available. IAS12 requires firms to now disclose a reconciliation between the statutory tax rate applicable to the firm and the ETR reported in the financial statements (IASB 2010).

items indicate a firm's engagement in specific tax planning activities leading to these differences disclosed in the reconciliation.

This chapter contributes to the current literature on MNEs' engagement in tax planning, incentives for tax planning of the UK firms in the post-financial-crisis period and the value relevance of tax planning for their shareholders. Firstly, the chapter analyses and compares tax planning strategies of domestic and internationally oriented UK domiciled non-financial firms listed on the London Stock Exchange (LSE). Benefiting from overseas lower tax rates is one of the tax planning strategies used by MNEs, and unlike other tax planning strategies, this strategy is beyond the control of a single tax authority (OECD 2013). MNEs can thus take advantage of lower tax rates in overseas tax regimes by shifting their profits from a high tax regime, resulting in tax benefits for the MNEs at the cost of lower tax revenues for the country of origin. To the best of my knowledge, there has been no research in the UK comparing tax affairs of local and internationally oriented UK firms.

Secondly, the chapter focusses on the impact of risk, free cashflow and growth on tax planning in the post-financial-crisis period. The 2008 financial crisis imposed constraints on the availability of corporate funds (Vithessonthi and Tongurai 2015), and this may have given further incentives for firms to engage in tax planning activities to generate internal funds that are not subject to any external credit checks. These incentives are potentially larger for riskier firms that may struggle further to raise funds, firms with cashflow shortage and high growth firms which require cashflows to fund their growth. Due to the lack of transparency of tax planning activities, information about any funds generated through tax planning is not easily accessible to the market.

Tax planning can be used to delay tax payments to ease any cashflow issues in the current accounting period. Firms employ tax planning strategies not only to reduce the actual tax payments, but also to defer tax liabilities to later periods by reducing reported tax expenses (Graham et al. 2014). Tax saving in the form of cash or tax freed up due to deferral of tax payments is an important internal source of financing (Guenther et al. 2017), which is of further importance for firms in times of financial constraints and financial distress (Edwards et al. 2016), as they were constrained in the global financial crisis due to the contraction of credit for firms (Vithessonthi and Tongurai 2015). By studying the post-financial-crisis period (2010-2015), the current study contributes to the UK tax research literature on the role of tax planning in this financially constrained period. Finally, the current study provides evidence on whether the tax planning activities adopted by UK firms have any value relevance for shareholders while pursuing their incentives in the post-financial-crisis period.

The current study investigates the incentives for tax planning activities by UK domiciled non-financial firms from 2010 to 2015, using the income tax disclosures as per IAS 12. The study presents two unique measures of tax planning: the first measure, *disclosed tax planning*, is the difference between the statutory tax rate (STR) applicable on a firm and the tax expenses (ETR) reported by the firm in its income statement. The second measure, *undisclosed tax planning*, is the difference between the tax expense reported in the income statement (ETR) and tax paid (Cash ETR).

The combined effect of these two measures is the *total tax planning*.¹⁸ Furthermore, the details on components of the difference between STR and ETR as required by IAS 12 'income tax' (IASB 2010) are analysed to further understand disclosed tax planning. This data is manually collected from firm-year corporate reports between 2010 and 2015, creating a unique data set which highlights the main reasons disclosed by firms leading to differences between STR and ETR.

The current study finds that internationally oriented UK firms are involved in less total tax planning and on average pay taxes in excess of the STR in the UK. However, these firms engage positively in disclosed tax planning activities, reducing their ETR to report higher after-tax earnings, but then pay more taxes in cash in excess of the STR by engaging negatively in undisclosed tax planning. Finally, the current study supports the existing literature on firms involved in tax planning with target tax expenses to achieve, as UK firms started paying in excess of the STR after continuous reductions in STR (Scholes et al. 2014; Kim et al. 2019).

The current study finds no significant relationship between tax planning and risk, measured as share price volatility, free cashflows, and firm pursuing growth, measured as market to book ratio. These findings are possibly explained by the comparatively lower corporation tax rates in the UK, which have been consistently reduced over the sample period (OECD 2019). These findings suggest that risky firms, firms with free cashflows and growth firms do not engage in tax planning to signal their

¹⁸ An illustration of computations for these tax planning measures, using GSK Ltd.'s financial statement for 2015, is provided in Appendix A.

non-engagement in tax planning activities to prevent any bad reputation associated with tax planning. The study finds a significantly positive association of tax planning with firm characteristics associated with commonly available tax reliefs, such as R&D credits (HMRC 2007a). Hence, the insignificance of my results suggests that the incentive of signalling the non-engagement in tax planning is pursued by firms instead of arranging funds for growth while dealing with internal risk.

The current study finds a negative association between total tax planning activities and firm value, suggesting that these activities deteriorate shareholders' value. Interestingly, the study finds that this result is driven by 'disclosed tax planning' activities and that 'undisclosed tax planning' activities do not seem to have a negative effect on share value. This suggests that the UK market only values tax expenses reported in the income statement rather than the difference between the tax payments reported and tax payments disclosed in the cashflow statement because this difference is not reported as a separate item in the financial statements. Moreover, this difference could be considered a reversal of deferred tax items included in tax expenses in the income statement, for example, in the case of interest expenses and interest paid, but firms could use this reversal as a tax planning strategy. Previous literature does not make any distinction between 'disclosed' and 'undisclosed' tax planning: hence, this is an important contribution to the existing literature in terms of the value relevance of both types of tax planning.

These findings highlight the importance of tax planning disclosures for UK domiciled firms' market valuation, especially when these disclosures would probably appear positive due to the decreasing corporation tax rates. Moreover, the chapter finds that the specific tax planning components negatively valued by the market are

any permanent differences between tax and accounting treatment, tax impact of overseas tax rates differences, prior-years' tax adjustments and any tax planning items reported as 'others' by the firms, possibly due to the information asymmetry associated with these four tax planning items, as the other three items not negatively valued by the market are the obvious tax planning items: that is, R&D credits (HMRC 2012), relief for prior-year losses (HMRC 2013) and deferred tax adjustments in line with IAS12 (IASB 2010) due to the decreasing corporation tax rates in the UK (OECD 2019). The items not negatively valued have some supportive disclosures in the financial statements, such as R&D expenditures, losses reported in the previous years and deferred tax adjustments, which are tax reductions due to the decreasing tax rates in the UK. However, disclosures on permanent differences, tax activities in foreign countries, any reasons for the prior-years' tax adjustments and items reported as 'others' need further disclosures to understand the underlying tax planning activities.

The current study has important practical implications and suggestions. Firstly, I provide evidence for HMRC to promote market awareness about the financial implications of the overall tax planning activities of firms by publishing reports and running campaigns to maintain the negative valuation of these activities by the market, which indirectly will restrict firms' engagement in tax planning. Secondly, the market needs to consider the role of undisclosed tax planning activities in isolation from the total tax planning activities in its evaluation to fully understand the tax planning activities. Thirdly, firms should disclose more tax planning relevant information to reduce the information asymmetry associated with the identified tax planning activities.

This chapter is structured as follows: the next section covers the institutional considerations. Section 3 discusses relevant literature on tax planning and formulates

the research hypotheses. Section 4 introduces the research methodology. Section 5 gives the empirical results, provides further analysis, and runs some robustness checks. Section 6 concludes, identifies limitations, and suggests some avenues for future research.

3.2. Institutional and theoretical considerations

Tax planning has been mostly studied in the context of agency theory, with managers suspected to have personal incentives to engage in tax planning activities (Desai and Dharmapala 2006; Armstrong et al. 2015). Managers taking tax planning decisions with limited external scrutiny have opportunities to seek personal benefits by using the funds generated in risky investments (Desai and Dharmapala 2006; Abdul Wahab and Holland 2012; Armstrong et al. 2015). Moreover, the lack of public awareness about corporate tax matters, the limited tax planning disclosures and the differences between tax and accounting regulations, providing justifications for any differences between expected tax expense and actual tax expense reported, illustrate that tax is an area in which information asymmetries are large and with potential for agency conflicts. Tax planning is thus viewed in the literature as an indication of agency conflicts.

An alternative explanation for tax planning is offered by signalling theory. Signalling theory was first proposed in Economics by Akerlof (1970) and further developed in the Management discipline by Spence (1973), and since then, it has

been used in various disciplines.¹⁹ The intuition is that signals are sent to markets or recipients to reduce information asymmetries. In a tax planning context, to remove any potential bad reputation, firms will use tax planning relevant information to signal their financial contribution to the society.

With growing regulators' interests, nationally (HMRC) and internationally (OECD), there are benefits for managers to signal tax planning information to outsiders, in line with the signalling theory framework. In this framework, engagement in less tax planning, signalled by reporting higher income tax expenses, signals firms' greater contribution towards their society. However, a signal could be interpreted differently by outsiders, as observed by Perkins and Hendry (2005). Hence, engaging in lower tax planning activities could be interpreted as a lack of management skills and expertise, which highlights the importance of outsiders' expectations towards tax planning (i.e. the signal). A similar observation is made by Desai and Dharmapala (2009), who suggest that shareholders' valuation of tax planning is associated with corporate governance strength.

The standard (IAS 12) does not require any particular items to be disclosed: it only requires reconciliation between the statutory tax rate (expense/refund) and the effective tax rate (expense/refund). With any changes in the economic environment – for example, post-financial-crisis – changes in tax regulations, such as the reductions in corporation tax rates in the UK since 2010 and public awareness and media attention towards corporation tax matters, the agency problem associated with tax

¹⁹ For a review, see Connelly et al. 2011.

planning is expected to be controlled. Tax contributions as an indicator of firms' contributions towards society and also as an internal source of funds and cashflow require tax planning to be studied in a framework other than the agency framework, which is a gap in the existing literature.

3.3. Relevant literature and hypothesis development

3.3.1 Relevant literature

The existing literature on tax planning can be broadly divided into two categories. The first category includes studies around understanding the impact of various firm characteristics on the tax expenses of firms (e.g., Gupta and Newberry 1997; Holland 1998; Kraft 2014). These studies consider tax expenses dependent upon various firm characteristics without acknowledging any planning aspect of any decision aiming at reducing these expenses. Some studies investigate differences between taxation and accounting profits, referred to in the literature as 'Tax-Book Differences', which impact tax expenses (e.g., Cloyd et al. 1996; Mills and Newberry 2001).

The second category explores the missing (planning) aspect in the first category and investigates the underlying motivations behind variations in tax expenses. Studies in this category find an association between managers' background and tax aggressiveness (e.g., Dyreng et al. 2010) and between managers' compensation contracts (e.g., Phillips 2003; Armstrong et al. 2012; Rego and Wilson

2012) and tax avoidance.²⁰ Research in this category has studied tax planning in an agency theory context, and any motivation associated with tax planning is viewed as managers' decisions seeking personal benefits because of the information asymmetry associated with the confidential nature of tax planning. Some studies have attempted to measure any associated equity valuation of these tax planning activities, starting with a basic argument that higher tax expenses will result in higher after-tax profits, which will be appreciated by shareholders (Graham and Tucker 2006).

A review of tax research by Hanlon and Heitzman (2010) concludes that there is an insufficiency of tax planning research, which results in increasing research, as reported by Kovermann and Velte (2019). However, both of these reviews show that tax research is being conducted using an agency theory framework: hence, extant tax research has been structured around understanding, correcting and moderating the agency problem. Kovermann and Velte (2019) conclude that there is a need for further tax planning research beyond the agency framework and investigation of any role of other financial and non-financial factors on tax planning.

Motivated by the previous reviews on tax research and interested in studying the impact of the aftermath of the financial crisis on tax planning, I focus on the market-

²⁰ Studies in this category use various terms to refer to taxation-related activities of management: for example, Minnick and Noga (2010) use the term 'tax management', Desai and Dharmapala (2006) use 'tax planning' and Armstrong et al. (2015) use 'tax avoidance' to measure the outcome of tax activities. The terms 'tax management' and 'tax planning' are merely differences in terminology, as both studies use the same methodology to measure tax activities without any specific adjustments in the research models to differentiate between these terms. Tax avoidance, on the other hand, attempts to measure the outcome of management activities that produce any above-expectation outcome. Similarly, the tax planning literature is not consistent on tax planning measures (Hanlon and Heitzman 2010).

facing issues to construct my hypotheses in the following section in the context of signalling theory.

3.3.2 Hypothesis development

This section poses two main questions: the first is what factors lead firms to engage in tax planning activities; the second examines to what extent the UK market values tax planning activities by observing their impact on firm value. I address these two questions by developing two sets of hypotheses as follows:

3.3.2.1 The incentives for tax planning

3.3.2.1.1 International orientation

Internationally orientated firms have to engage with several tax authorities and shareholders across multiple tax jurisdictions: thus, compared to nationally orientated firms, internationally orientated firms may be subject to greater levels of tax planning information asymmetries. These information asymmetries may arise from differences in tax rates applicable on the firms' operations in different countries or from differences in tax regulation. Moreover, tax planning accountability is not the same in all countries, which may result in less tax planning disclosure. This greater information asymmetry provides further opportunities for internationally oriented firms to engage in tax planning.

A contrasting view is that internationally oriented firms are forced to comply with additional regulatory requirements, including tax regulations and stock exchange

regulations. So, internationally oriented firms are expected to engage in less tax planning because of these multiple tax-related compliance requirements. Moreover, the OECD has recently introduced its Base Erosion and Profit Shifting (BEPS) Action Plan to regulate MNEs' tax planning strategies exploiting foreign tax systems, which acts as a control mechanism on the use of international orientation for the sake of tax planning (OECD 2013).

However, MNEs may have lower global tax bills due to a substantial statutory tax rate difference between the home country (with higher STR) and foreign countries (with lower STRs), and firms with higher foreign operations are expected to have higher tax planning (Mills et al. 1998; Rego 2003). These findings make sense for US-based research because the statutory corporation tax rates are among the highest in the world (35%: OECD 2019), so firms would have tax saving incentives to report their profits in other lower tax regimes (e.g., Apple and Google reporting revenues in the Republic of Ireland). Kraft (2014) also finds higher tax savings for German firms with foreign operations, which further strengthens the initial argument, as German corporation tax rates are also amongst the highest in the world (35%: OECD 2019). However, with the reducing corporation tax rates in the UK, this relationship could be observed as negative: that is, firms with foreign operations may have to pay comparatively higher taxes in the foreign tax regimes. This expectation of higher tax savings for internationally oriented firms is higher for firms that are subject to US taxation, but the association is not expected to be as strong in the case of UK firms due to lower UK corporation tax rates.

The empirical papers discussed above offer mixed evidence on the relationship between international orientation and tax planning. Moreover, there are

unprecedented factors, such as the decreasing UK corporation tax rates, increased public awareness and growing regulatory attention, which may influence this relationship between international orientation and tax planning. Based on the above discussion, I formulate the first hypothesis as follows:

H1: Tax planning is associated with the international orientation of UK firms

3.3.2.1.2 Risk

Firms with higher overall risk incur higher borrowing costs and may have more restrictive covenants on their secured loans, limiting their ability to issue further finance. Tax planning can be an attractive internal source of financing for these firms. The cost of arranging this finance is any cost associated with tax planning and any market valuation and reputation impact for engaging in tax planning signalled through tax-planning-related disclosures.

Also, a firm's tax planning activities can contribute to its exposure to risk and uncertainty. This is mainly due to the confidential nature of tax planning activities, which leads to information asymmetry between management and stakeholders. This information asymmetry is further expected to increase with an increased level of tax planning (Hope et al. 2013; Balakrishnan et al. 2019). Moreover, some types of tax reliefs, such as R&D credits, are a fiscal tool to encourage investment in certain sectors and certain ventures that may carry higher risk. Similarly, tax reliefs are offered to internationally oriented firms in the form of tax holidays, tax havens or reduced tax rates. These are incentives for firms to engage in risky ventures in those foreign countries, and any tax savings are part of the reward for undertaking such ventures.

Internationally oriented firms will benefit from the lower foreign tax rates and other tax incentives offered at the cost of additional risk exposure.

The literature is inconclusive regarding the relation between tax planning and firm risk. For example, Guenther et al. (2017) find a significant positive relationship between tax planning and future volatility, but find no relationship between tax planning and firm risk, measured as share return volatility. As tax planning is viewed to contribute to the overall firm risk (Rego and Wilson 2012), firms with higher risk should engage in less tax planning to minimise their overall risk. Moreover, a firm with high risk would signal less engagement in tax planning activities by reporting high tax expense, thus reducing the tax-planning-related risk perceived by the market.

Considering tax planning as an internal source of funds and its potential importance for a risky firm, the current study attempts to examine the impact of firm risk on its engagement in tax planning and the second hypothesis is set as:

H2: Tax planning is associated with UK firms' risk

3.3.2.1.3 Free Cashflow

Poor cashflow may signal liquidity concerns to shareholders and potential investors and using cash savings from delaying and/or reducing tax payments could be seen as an internal cash smoothing option. Due to the deferred nature of some of the tax expenses, tax planning activities aiming at deferring tax expenses to facilitate cashflows will not be reflected in the reported tax expenses and hence may not raise

any concerns from the market and the tax authorities. Hence, firms with poor cashflow will engage in tax planning to benefit from this internal source of cash.

A contrasting view is that firms with higher free cashflows are expected to have more resources at their disposal to invest in tax planning, either in the form of in-house tax planning or by utilising professional tax consultancy services. However, in light of the current market awareness and regulatory attention towards tax planning matters of firms in particular, firms are expected to invest their funds in other viable projects instead of investing in tax planning activities.

The impact of free cashflow on tax planning is not greatly studied. Kraft (2014) finds a negative relationship between cashflow and tax planning, explaining the use of tax planning as an internal source of cash. On the other hand, Koester et al. (2017) find a positive association between free cashflow and tax planning, supporting the contrasting view.

Guenther et al. (2017) found that cash generated from tax planning activities is not invested by multinational firms with financial constraints; rather, it is used to pay debts. Edwards et al. (2016) argue that financially constrained firms use tax planning to generate (save) cash instead of cutting down on other expenses that may influence their product quality and sales. On the other hand, tax savings from lower overseas tax rates are kept overseas as cash balances and investments to avoid any further taxes when remitting these savings back to the home country (Collins et al. 1998; Dyreng and Markle 2016). Firms with cash flow shortages may arrange cash from tax savings to pay for the debts that they may have incurred in the foreign countries.

Tax planning activities that defer the tax payments to a later date, hence bringing cash flow benefits, or that reduce the tax expense, both result in improved cash flows in a particular accounting period. While a reduction in tax expenses could result in a poor reputation in the market, a deferred tax expense will mostly go undetected through the tax expenses reported in the income statement. This cashflow management technique has no additional costs, as argued by Armstrong et al. (2012) because the tax amount due is settled between the firm and tax authorities at a later point. Cash saved (generated) through tax planning can be viewed as an internal source of finance with options to negotiate and pay back any tax assessments to the tax authorities before the matter leads to a tax penalty and eventually goes to the press.

The decreasing corporation tax rates in the UK may have provided some cash flow support to firms, reducing any needs to engage in tax planning activities to support cashflow. However, the continuous reduction throughout and beyond the sample period (OECD 2019) possibly suggests further need for cashflow support for firms in the UK, and hence, it is expected that UK firms will engage in tax planning activities to manage their cashflows.

The above discussed expectations based on the theory, the relevant market and regulatory attention and empirical papers suggest a negative association between free cashflows and tax planning. Hence, I formulate the third hypothesis as follows:

H3: Tax planning is negatively associated with UK firms' free cash flows

3.3.2.1.4 Growth

Growth firms need financing to develop their growth opportunities, and financing was particularly constrained after the 2008 financial crisis period (Vithessonthi and Tongurai 2015). Moreover, firms with high growth opportunities have a higher level of information asymmetry (Myers and Majluf 1984), which can impact their ability to raise needed additional funds. Funds generated (saved) from tax planning could be a feasible financing option. On the other hand, tax planning increases information asymmetry due to the absence of disclosure of tax planning activities adopted (Hope et al. 2013; Balakrishnan et al. 2019), requiring growing firms to devise balanced tax planning strategies.

Growing firms may also face higher equity costs due to the above-mentioned information asymmetry, which, collectively with higher financing costs, leads to higher expected return and thus results in the use of a higher discount factor for any future investment appraisals. Hence, these firms may end up rejecting future investment projects, resulting in suboptimal investment decisions that negatively impact their growth strategies (Fosu et al. 2016). To strike a balance between controlling information asymmetry and engaging in tax planning to arrange much-needed finance, firms get support from corporate governance mechanisms to gain shareholders' trust in the tax planning activities adopted: Desai and Dharmapala (2009) found a positive relationship between tax planning and shareholders' valuation of firms, subject to a stronger corporate governance mechanism.

Growing firms are expected to make investments that lead to tax deductible expenses and are hence positively related with disclosed tax planning, as argued by Chen et al. (2010). In contrast to this, Kraft (2014) argued that growing firms are less likely to be interested in engaging in tax reduction, as they are highly valued by the

market, so their focus is on improving their market value. Growing firms are expected to have positive net present value (NPV) projects to invest in, rather than investing in any tax-reducing investments, and this non-engagement in tax planning activities will also signal a positive contribution of the firms to the regulators and society. Based on the previous mixed arguments and findings, tax planning is expected to be associated with the growth of firms.

H4: Tax planning is associated with UK firms' growth

3.3.2.2 The value relevance of tax planning in the UK

Tax planning activities reported by a firm will reach the market, signalling the firm's overall tax planning attitude, and this information will have an effect on the market valuation of the firm.

Initial research on the impact of tax planning on firm valuation has found that tax savings substitute for interest savings (Graham and Tucker 2006) and hence are positively associated with firm value. On the other hand, Desai and Dharmapala (2006), motivated by agency theory, argued that shareholders view managers as seeking personal benefits with their engagements in tax planning activities: hence, these engagements are valued negatively. Further studies confirmed the positive association in the presence of strong corporate governance (Desai and Dharmapala 2009; Wilson 2009; Armstrong et al. 2015) and the negative association in the case of any sudden tax-planning-related news in the media (Hanlon and Slemrod 2009).

In contrast to the above US-based studies, UK-based research has found a negative association between tax planning and firm value, with no corporate governance moderating effects (Abdul Wahab and Holland 2012). This negative association is found in the case of sudden tax-planning-related news, with better-governed firms experiencing greater drop in value (Choy et al. 2017). This further highlights the importance of tax-planning-related disclosures and their value relevance in the UK.

Theoretical considerations and the papers discussed above suggest a negative association of tax planning with firm value in the UK, and hence I construct my fifth hypothesis as follows:

H5: Firm value is negatively associated with tax planning in the UK

3.4. Methodology

3.4.1 Sample selection

The initial sample consists of UK domiciled non-financial firms continuously listed on the London Stock Exchange between 2010 and 2015. Any firms delisted during the sample period are excluded from the sample for all years. This sampling strategy introduces survivorship bias but at the same time it provides a balanced set of panel data of firms with consistent motivation to engage in tax planning. Moreover, delisted firms actively trading are also not included in the sample as they are not obliged anymore to disclose tax planning information under IAS 12. Firms that were not active partially during the sample period were excluded from the sample to have a balanced representation of firms' in each sample year. This is important to capture impact of

decreasing tax rates on firms' tax planning strategies which might be biased by the inclusion of these firms' tax planning activities partially during the sample period.

The sample is restricted to UK domiciled firms because these firms are equally subject to the UK tax regulations, and financial firms are excluded, since they are subject to different reporting regulations from non-financial firms. The sample period starts from 2010 to allow investigation of the financing and cashflow challenges faced by firms in the period following that 2008 financial crisis. Moreover, 2010 marks the start of the reduction in UK corporate tax rates: until that point, the rates were fixed at 30% for a decade (OECD 2019). These decreasing tax rates may provide sufficient financial and cashflow support to UK firms to influence their incentives to engage in tax planning activities.

Mills et al. (1998) and Abdul Wahab and Holland (2012) argue that consistently profit-making firms are expected to have a stronger incentive towards tax planning and thus only consider those firms in their research. However, financial decision-makers may consider taking advantage of tax saving opportunities even when reporting losses for a particular accounting period. In fact, any losses before tax expense shown in the income statement are subject to adjustments to get taxable profits or losses, which are then taxed using appropriate corporation tax rates or allowed for to get appropriate tax reliefs, respectively. These adjustments may well convert accounting loss to taxable profit and vice versa. Thus, by restricting the analysis to profit-making firms only, the literature may have failed to understand firms' tax planning strategies.

Panel A of Table 3.1 presents the sample selection criteria, and Panel B shows the sample allocation over different industries as per the Industry Classification

Benchmark (ICB). A total of 338 non-financial firms remained listed on the LSE for the entire sample period. Financial data is for 37 firms, and after eliminating any firms with missing financial statements for one or more years, the sample comprises 261 firms, as presented in Panel A. In line with the literature (e.g., Wahab and Holland 2012), firm years with extreme ETR and Cash ETR (i.e. < -1 and > 1) are excluded from the sample, as these extreme values show tax planning of more than the profit before tax, which is only possible in exceptional situations and if not excluded will influence results, resulting in 1382 firm year observations.

Panel C of Table 3.1 aggregates firms based on their profitability over the sample period. It shows that 70.55% of the firms reported profit in each of the accounting period sample periods, while 14.98%, 7.31%, 3.4%, 2.24% and 1.01% of firm years firms reported profits for 5, 4, 3, 2 and 1 years, respectively and 0.51% firms reported losses for the entire period. Due to lack of information in the tax reconciliation disclosure, it is not possible to measure the tax planning for firms with losses for the entire period. Moreover, due to the small number of firms reporting loss for the entire period (0.51% of the sample), it is not possible to explore any firm-specific characteristics of this small sub-group of firms separately; however, these firms are included in the sample for combined analyses.

Table 3.1 Sample selection

Panel A presents the number of firms that remained listed throughout the period and whose financial data is also accessible. Panel B further splits the firms based on the number of years in which these firms reported profits. Panel C presents the total number of firm years available after excluding any years with extreme Effective Tax Rate (ETR >1 or ETR <-1) and Cash Effective Tax Rate (CETR >1 or CETR <-1). Panel C presents total tax planning, disclosed tax planning and undisclosed tax planning for the sample period in columns (d), (e) and (f), respectively. Column (a) shows the number of profit reporting periods out of the total of six accounting periods for each firm (2010-2015). Columns (b) and (c) show the number of firm years with respect to the number of profitable years reported by those firms and the percentage of these years from the total sample. Panel D provides tax planning findings for the sample period that is listed in column (a). Columns (b) and (c) show the main tax rate and small business tax rates respectively that were applicable over the sample period. Columns (d), (e) and (f) show total tax planning, disclosed tax planning and undisclosed tax planning for the sample period, respectively.

Panel A						
Description	Number of firms					
All listed non-financial firms	338					
Excluded:						
Firms unavailable in Bloomberg	(37)					
Firms without complete financial statements	(40)					
Final sample size (number of firms) in each year	261					
Complete firm-year observations (261*6)	1566					
Exclude:						
Outliers	(184)					
Final firm-year observations	1382					
Panel B						
ICB Industry	Firm years	Percent				
Basic Materials	83	6.01				
Consumer Goods	198	14.33				
Consumer Services	315	22.79				
Health Care	75	5.43				
Industrials	511	36.98				
Oil & Gas	60	4.34				
Technology	69	4.99				
Telecommunications	29	2.10				
Utilities	42	3.04				
Total	1382	100.00				
Panel C						
(a) Periods with positive earnings:	(b) Firm years	(c) Percent	(d) Total TP (%) (TP4_TOTAL)	(e) Disclosed TP (%) (TP1_DISC)	(f) Undisclosed TP (%) (TP3_UNDIS)	
6	975	70.55	2.45	2.31	0.26	
5	207	14.98	-4.38	2.37	-6.38	
4	101	7.31	-11.70	-4.56	-7.19	
3	47	3.40	-13.71	-4.08	-9.62	
2	31	2.24	-17.30	-8.95	-7.76	
1	14	1.01	-16.24	-12.02	-4.22	
0	7	0.51	-23.68	-6.17	-17.51	
Total	1,382	100	-0.92	1.16	-1.93	
Panel D						
(a) Financial Year	(b) Main tax rate (%)	(c) Small rate (%)	(d) Total TP (%) (TP4_TOTAL)	(e) Disclosed TP (%) (TP1_DISC)	(f) Undisclosed TP (%) (TP3_UNDIS)	
2010	28	21	3.41	2.23	1.32	
2011	26	20	3.51	5.38	-1.93	
2012	24	20	0.94	2.43	-1.29	
2013	23	20	-1.93	-0.05	-1.73	
2014	21	20	-5.12	-0.42	-4.44	
2015	20	20	-6.43	-2.69	-3.55	
		Total	-0.92	1.16	-1.93	

3.4.2 Measurement of variables

3.4.2.1 Main dependent variables: Tax planning and market value

Tax planning: Statutory tax rates (STR) are set by governments to deduct a percentage of profits as taxes, and the Effective Tax Rate (ETR) is the percentage of profit reported in the income statement as tax expense. Any difference between STR and ETR could be due to temporary differences between accounting profits and tax adjusted profits; these temporary differences may not represent the total tax planning. Permanent differences, on the other hand, represent actual tax savings, but these may or may not represent the total tax planning because they may be associated with firm characteristics. Any difference between STR and cash ETR (total tax planning) represents all temporary and permanent tax differences, some of which could be associated with firm characteristics. Different firm characteristics, such as size, capital structure, profitability and investment intensity, may impact ETR, which is the main component of tax planning calculations. It is therefore important to consider firm characteristics and their impact on tax planning. As discussed in Chapter 2, the three measures of tax planning are expressed in the following equations:

$$\text{Statutory Tax Rate (STR)} - \text{Effective Tax Rate (ETR)} = \text{TP_DISC} \text{ [disclosed tax planning]} \quad (1)$$

$$\text{Effective Tax Rate (ETR)} - \text{Cash ETR} = \text{TP_UNDISC} \text{ [undisclosed tax planning]} \quad (2)$$

$$\text{STR} - \text{Cash ETR} = \text{TP_TOTAL} \quad [(1) + (2)] \quad \text{[total tax planning]} \quad (3)$$

The three tax rates used in the above equations, namely STR, ETR and Cash ETR, are all computed as a ratio of Profit Before Tax (PBT). Disclosed tax planning and

undisclosed tax planning are a split of total tax planning as a difference between STR and ETR and between ETR and Cash ETR, respectively

As described in equation (3) above, in line with the existing literature, the current study uses the difference between STR and Cash ETR²¹ (Dyreng et al. 2008) to compute total tax planning. An illustration of these variables' computation is provided in Appendix A. However, unlike Dyreng et al. (2008), the current study uses annual Cash ETR instead of the five-year moving average of Cash ETR. Their use of average Cash ETR is well justified in the context of the US taxation system, since US corporation tax rates have stayed constant over a long period. The annual Cash ETR used in the current study allows for the analysis of the impact on tax planning of reducing corporation tax rates.

Table 3.1, Panel D column (b) and (c) present corporation tax rates in the UK over the sample period, and as discussed above, it can be seen in the table that UK rates have decreased.

To measure market value, I use Tobin's Q, which has been widely used to measure market value of firms in tax planning studies (Desai and Dharmapala 2009; Abdul

²¹ Dyreng et al. (2008) argue that the payments for taxes are usually delayed by a year: hence, cash ETR has a mismatch of numerator and denominator. This issue can be addressed by separating the sample firms into large²¹ and other firms: i.e. 1) large firms that are required to start paying their tax liabilities in advance in instalments and hence their tax payment may not need lagging; and 2) firm that pay their tax liabilities nine months and one day after the end of their accounting period. As the sample for the current study mainly consists of large businesses, there is no need to lag the tax payments by a year when calculating Cash ETR. The threshold for large firms in the UK is augmented profits of £1.5 million. The augmented profits are computed as total tax adjusted profits plus any dividends received by the company. The threshold is reduced for a group, which is done by dividing the threshold by the total number of firms in the group, including the parent company (HMRC 2007b).

Wahab and Holland 2012). In line with these studies, I measure Tobin's Q using three months' lagged values from the reporting date to substitute for the lagged market value. This lagged market value allows me to capture any market reactions to the reported tax planning activities in the financial statements.

3.4.2.2 Main independent variables: international orientation, risk, free cash flows, and growth

Previous literature argues that firms which have 25% or above of their sales abroad have international orientation (Koster and Karlsson 2009; O'Connor et al. 2011; Tan et al. 2017). Another argument used in the literature to identify firms with international orientation is the firms' exposure to additional foreign economic risk, political risk and foreign exchange risk. I have instead used foreign stock exchange listing as my measure of international orientation. If ordinary shares of a firm are traded on more than one stock exchanges then the firm is classed as multiple listed. This measure considers the foreign listing and reporting requirements that may influence a firm's signalling of tax planning activities. Firms which have multiple listings must meet multiple listing criteria and will have to maintain good market reputation in multiple reporting regimes. From a signalling perspective, cross-listed firms are more exposed to the scrutiny of different investors and thus may be more likely to want to signal good behaviour to the market. As a proxy for international orientation, the current study uses a binary variable, coding 0 for a single stock exchange listing and 1 otherwise.

As a measure of risk, the current study uses share return volatility, since it represents the overall firm risk.²² Growth is measured as a ratio of market-to-book value, where market value is the market capitalisation of a firm's shares and book value is the book value of the firm's equity. I have used this market-based measure of growth in line with Phillips (2003) instead of any internal measures of growth for example, sales growth. This market-based measure of growth measures a wider market perception of growth that may include a firm's future growth potentials requiring funds to finance such growth. Free cash flows are measured as free operating cash after accounting for any investments made during the period, computed as operating cashflows minus cash outflows on investing activities as reported in firms' cashflow statements.

3.4.2.3 Firm characteristics: control variables

Large firms will have more resources to invest and more opportunities to save by engaging in tax planning. However, their tax activities will be observed more closely by tax authorities. This may justify the inconsistent results found in in the research (Zimmerman 1983; Holland 1998; Mills et al. 1998; Rego 2003; Hanlon et al. 2007; Kraft 2014). Since large firms are more exposed to scrutiny from both governments and the general public, they will not signal a "poor citizen" image by paying fewer taxes

²² An alternative measure is systematic risk, as measured through beta; however, this does not represent the overall risk encountered by a firm. Another measure is the book value of risk measured as the debt to equity ratio but this measure fails to capture the market valuation of risk which is important in a signalling theory framework.

(Graham et al. 2014). Hence, in line with signalling theory, the current study expects tax planning to be negatively associated with size, measured as log of total assets.

Due to the deductibility of interest expenses, debt financing will positively contribute towards tax planning (Plesko 2003; Richardson and Lanis 2007; Noor et al. 2010; Kraft 2014). As previously found in the literature, I expect a positive relationship between tax planning and leverage, measured as the ratio of total debt to total assets.

Capital-intensive firms are expected to benefit from the legislative tax shields available through deductibility of tax depreciation and amortisation, while less capital-intensive firms will not get this opportunity to reduce their taxable income. I measure this as the ratio of non-current assets to total assets and expect a positive relationship between capital intensity and tax planning, in line with the previous literature (Gupta and Newberry 1997; Richardson and Lanis 2007; Chen et al. 2010; Noor et al. 2010).

Since there is a possible substitution effect between capital investments and inventory investments due to different operational models – for example, in-house manufacturing facilities to meet the sales demand vs. maintaining a high level of inventories' stock from outsourced manufacturing – the current study expects a negative association between tax planning and inventory intensity, measured as the ratio of inventories to total assets (Gupta and Newberry 1997; Kraft 2014).

Compared to firms with lower profits, firms with higher profits will have more resources to manage tax affairs, and their costs to manage those tax affairs are a smaller proportion of their pre-tax profits. Hence, firms with higher profits will have higher tax planning (Derashid and Zhang 2003; Noor et al. 2010; Kraft 2014).

Moreover, in line with signalling theory, the current study predicts that since the general public expects firms with high profits to pay their share towards society, those firms will signal their higher contribution by paying more tax and thus being involved in less tax planning. Abdul Wahab and Holland (2012), Gupta and Newberry (1997), and Minnick and Noga (2010) found a positive relationship between profit and tax planning.

3.4.2.4 Corporate governance: control variable

Tax planning is positively associated with firm value in the presence of strong firm-level corporate governance (Desai and Dharmapala 2009). Good levels of corporate governance propagate positive signals about firms' governance practices. This may allow firms to engage in tax planning activities with reduced concerns about the market's adverse response. This chapter uses the governance score to proxy for the strength of firms' overall governance practices. In line with the above-mentioned literature, the current study expects corporate governance score to be positively associated with total tax planning. A summary of the main literature review of the variables used in this chapter is given in Appendix B.

3.5.3 Empirical model

The regression equations are presented below and test the relationship between each of the measures of tax planning (total tax planning, disclosed tax planning and undisclosed tax planning) and the four key independent variables: international orientation, risk, free cashflows and firm growth, along with the control variables. The

regression equations are estimated using Ordinary Least Squares (OLS) with year- and industry-fixed effects.

$$\begin{aligned}
 TP_TOTAL_{it} = & \beta_0 + \beta_1 MULTI_LIST_{it} + \beta_2 VOLATILITY_{it} + \beta_3 FREE_CASH_{it} \\
 & + \beta_4 MTOBOOK_{it} + \beta_5 LEV_{it} + \beta_6 TA_{it} + \beta_7 PBT_{it} + \beta_8 R\&D_{it} \\
 & + \beta_9 CAP_INT_{it} + \beta_{10} INV_INT_{it} + \beta_{11} GOV_SCO_{it} \\
 & + \sum_{n=1}^9 \beta_n IND_DUM_{it} + \sum_{n=1}^6 \beta_n YEAR_DUM_i + \varepsilon_{it}
 \end{aligned}$$

Equation 1

$$\begin{aligned}
 TP_DISC_{it} = & \beta_0 + \beta_1 MULTI_LIST_{it} + \beta_2 VOLATILITY_{it} + \beta_3 FREE_CASH_{it} \\
 & + \beta_4 MTOBOOK_{it} + \beta_5 LEV_{it} + \beta_6 TA_{it} + \beta_7 PBT_{it} + \beta_8 R\&D_{it} \\
 & + \beta_9 CAP_INT_{it} + \beta_{10} INV_INT_{it} + \beta_{11} GOV_SCO_{it} \\
 & + \sum_{n=1}^9 \beta_n IND_DUM_{it} + \sum_{n=1}^6 \beta_n YEAR_DUM_i + \varepsilon_{it}
 \end{aligned}$$

Equation 2

$$\begin{aligned}
 TP_UNDISC_{it} = & \beta_0 + \beta_1 MULTI_LIST_{it} + \beta_2 VOLATILITY_{it} + \beta_3 FREE_CASH_{it} \\
 & + \beta_4 MTOBOOK_{it} + \beta_5 LEV_{it} + \beta_6 TA_{it} + \beta_7 PBT_{it} + \beta_8 R\&D_{it} \\
 & + \beta_9 CAP_INT_{it} + \beta_{10} INV_INT_{it} + \beta_{11} GOV_SCO_{it} \\
 & + \sum_{n=1}^9 \beta_n IND_DUM_{it} + \sum_{n=1}^6 \beta_n YEAR_DUM_i + \varepsilon_{it}
 \end{aligned}$$

Equation 3

where TP_TOTAL is the total tax planning, measured as the difference between STR and Cash ETR. TP_DISC is the disclosed tax planning, measured as the difference between STR and ETR. TP_UNDISC is the undisclosed tax planning, measured as the difference between ETR and Cash ETR. MULTI_LIST is international orientation, measured as a binary variable for single or multiple stock exchange listings. VOLATILITY is firm risk, measured as share price volatility. FREE_CASH is free operating cash after accounting for any investments made. MTOBOOK is the market to book value of a firm. Control variables: LEV is leverage, measured as the total debt to equity ratio; TA is total assets, measured as Ln of total assets; PBT is measured as

profit before tax; R&D is measured as R&D expenditure to total assets; CAP_INT is measured as the ratio of the value of property, plant and equipment to total assets; INV_INT is measured as the ratio of inventory value to total assets; GOV_SCO is the governance score, collected from DataStream; IND_DUM are industry dummies, and YEAR_DUM are year dummies. All continuous variables are winsorized at the 1st and 99th percentiles to mitigate the effect of outliers.

The regression equations presented below test the relationship between the firm value and each of the measures of tax planning (total tax planning, disclosed tax planning and undisclosed tax planning), along with the four key independent variables: international orientation, risk, free cashflows and firm growth, and the control variables. The regression equations are estimated using Ordinary Least Squares (OLS) with year- and industry-fixed effects:

$$\begin{aligned}
 TOBINSQ_{it+1} = & \beta_0 + \beta_1 TP_TOTAL_{it} + \beta_2 MULTI_LIST_{it} + \beta_3 VOLATILITY_{it} \\
 & + \beta_4 FREE_CASH_{it} + \beta_5 LEV_{it} + \beta_6 TA_{it} + \beta_7 PBT_{it} + \beta_8 R\&D_{it} \\
 & + \beta_9 CAP_INT_{it} + \beta_{10} INV_INT_{it} + \beta_{11} GOV_SCO_{it} + \sum_{n=1}^9 \beta_n IND_DUM_{it} \\
 & + \sum_{n=1}^6 \beta_n YEAR_DUM_i + \varepsilon_{it}
 \end{aligned}$$

Equation 4

$$\begin{aligned}
 TOBINSQ_{it+1} = & \beta_0 + \beta_1 TP_DISC_{it} + \beta_2 MULTI_LIST_{it} + \beta_3 VOLATILITY_{it} \\
 & + \beta_4 FREE_CASH_{it} + \beta_5 LEV_{it} + \beta_6 TA_{it} + \beta_7 PBT_{it} + \beta_8 R\&D_{it} \\
 & + \beta_9 CAP_INT_{it} + \beta_{10} INV_INT_{it} + \beta_{11} GOV_SCO_{it} + \sum_{n=1}^9 \beta_n IND_DUM_{it} \\
 & + \sum_{n=1}^6 \beta_n YEAR_DUM_i + \varepsilon_{it}
 \end{aligned}$$

Equation 5

$$\begin{aligned}
TOBINSQ_{it+1} = & \beta_0 + \beta_1 TP_UNDISC_{it} + \beta_2 MULTI_LIST_{it} + \beta_3 VOLATILITY_{it} \\
& + \beta_4 FREE_CASH_{it} + \beta_5 LEV_{it} + \beta_6 TA_{it} + \beta_7 PBT_{it} + \beta_8 R\&D_{it} \\
& + \beta_9 CAP_INT_{it} + \beta_{10} INV_INT_{it} + \beta_{11} GOV_SCO_{it} + \sum_{n=1}^9 \beta_n IND_DUM_{it} \\
& + \sum_{n=1}^6 \beta_n YEAR_DUM_i + \varepsilon_{it}
\end{aligned}$$

Equation 6

where TOBINSQ is measured as market to book value of equity using market value three months after the reporting date. All other variables used in this second set of models are same as in the first set. All continuous variables are winsorized at the 1st and 99th percentiles to mitigate the effect of outliers.

3.6. Empirical results

3.6.1 Descriptive statistics

Descriptive statistics are presented in Table 3.2. As presented in Table 3.2 column B(b), on average 0.92% of PBT is paid in excess of the statutory tax rates. This observation goes against the general perception that firms do not pay taxes. Considering the reducing STRs in the UK as reported in Table 3.1 (Panel D (b)), the total tax planning is 3.41%, 3.51%, 0.94%, -1.93%, -5.12% and -6.43% for the six years from 2010 to 2015, respectively, as reported in column (d). This indicates that on average, firms paid 3.41% less tax than the statutory tax rate of 28% in 2010 and so on. This gap between tax paid and statutory tax rate reduced to -6.43% in 2015, when the statutory tax rate was 20%, resulting in overall negative tax planning of -0.92%: that is, over the sample period, firms on average paid 0.92% tax in excess of what they were required to pay. This finding is in line with the existing literature, which

argues that firms have specified targets for tax expenses that they achieve and maintain (Scholes et al. 2014; Cook et al. 2017; Kim et al. 2019). This trend of reducing total tax planning also supports HMRC's claims of a reduction in the tax gap (HMRC 2016b).

Analysis of total tax planning in relation to PBT reported by firms, presented previously in Table 3.1 Panel C column (d), shows a tax saving of 2.45% for firms reporting profits throughout the sample period (i.e. 2010 – 2015). Negative tax savings are made by firms reporting losses for one or more accounting periods. The negative tax savings increase from -4.38% to -23.68% for firms reporting losses for one accounting period to six accounting periods as reported in column (d). This shows an inverse relationship between the number of loss-reporting periods and total tax planning (TP_TOTAL). It also indicates that loss-reporting firms do engage in tax planning, but differently from firms reporting profits throughout. Moreover, tax relief for these losses is available from HMRC in future by way of reduction in taxable profits in the following profit-making periods. So, in the loss-making periods, reporting and paying more tax will not do much harm, but may lead to more benefit in the following profit-making years by reducing any tax payments. This observation is not in line with the assumptions of the existing literature (e.g., Desai and Dharmapala 2009; Abdul Wahab and Holland 2012), which only studies profit-reporting firms, assuming that only firms continuously reporting profits have incentives to engage in tax planning.

Disclosed tax planning and undisclosed tax planning are 1.16% and -1.93% respectively, as summarised in Table 3.2 column (b), showing that firms on average reported 1.16% more tax than STR but then paid 1.93% more than they reported and 0.92% more than they were expecting. Table 3.1, Panel C, columns (e) and (f) show

that disclosed and undisclosed tax savings are 2.31% and 0.26% respectively for firms reporting profits throughout the sample period. Firms reporting losses for some accounting periods have varying tax planning, similar to the total tax planning explained in the previous paragraph.

Table 3.2 Descriptive statistics

This table provides the summary statistics for the variables as shown in column (A), which are total tax planning (TP_TOTAL), measured as the difference between statutory tax rate and cash effective tax rate; disclosed tax planning (TP_DISC), measured as the difference between statutory tax rate and effective tax rate; undisclosed tax planning (TP_UNDISC), measured as the difference between effective tax rate and cash effective tax rate; share price volatility (VOLATILITY) measured as the annualised value of share price changes for 180 days; leverage (LEV), measured as the ratio of total debt to total assets; free cashflow (FREE_CASH), measured as net operating cashflows minus investments made; growth (MTOBOOK), measured as the ratio of market capitalisation to net assets; three months' lagged value of Tobin's Q (TOBIQS+3); natural log of total assets (TA); profit before tax (PBT), capital intensity (CAP_INT), measured as the ratio of property plant and equipment to total assets; R&D intensity (R&D_INT), measured as the ratio of R&D expenditure to total assets; inventory intensity (INV_INT), measured as the ratio of inventory value to total assets; and governance score (GOV_SCO) collected from DataStream. Column (B) presents descriptive statistics for the total sample. There are different observations, as can be noted in column (a), because of data availability at the three data sources used: i.e. financial statements, Bloomberg and Datastream. Average total tax planning in column (b) is -0.92, indicating that the overall firms paid 0.92% of PBT in excess of Statutory Tax Rate (STR). Disclosed tax planning (TP_DISC) is +1.16, indicating that firms have reported 1.16% (of PBT) less than STR but they paid 1.93% more than what they reported. Columns (c) and (d) present minimum and maximum values respectively, which are within their relevant acceptable ranges.

A Variable	B				C		D		E		F		G		H		I		J		K	
	(a)	(b)	(c)	(d)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
	N	M /SD	Min	Max	N	M /SD	N	M /SD	N	M /SD	N	M /SD	N	M /SD	N	M /SD	N	M /SD	N	M /SD	N	M /SD
TP_TOTAL	1382	-0.92 20.46	-126.74	85.71	83	-3.84 24.52	198	-1.67 19.75	315	0.47 15.78	75	-4.76 22.87	511	1.24 20.95	60	-8.94 22.13	69	-6.59 25.82	29	-3.88 20.53	42	1.28 18.30
TP_DISC	1382	1.16 17.66	-113.95	98.67	83	-3.82 22.77	198	-0.59 13.66	315	2.16 17.46	75	2.05 19.09	511	2.03 15.44	60	2.47 29.03	69	0.10 25.15	29	4.54 8.71	42	-2.97 13.37
TP_UNDIS	1382	-1.93 20.31	-138.46	101.14	83	-0.70 20.34	198	-0.33 17.81	315	-1.68 18.02	75	-5.50 28.18	511	-0.79 19.02	60	-11.1 29.28	69	-6.72 22.37	29	-8.55 24.71	42	4.25 18.97
VOLATILITY	1382	37.66 15.05	15.03	96.60	83	43.59 16.67	198	38.92 16.74	315	37.86 15.30	75	36.17 12.83	511	35.54 12.31	60	38.97 18.33	69	47.25 21.79	29	29.59 8.79	42	34.73 9.10
FREE_CASH	1374	5.63 8.16	-63.15	111.17	83	3.04 7.83	198	7.94 9.20	312	6.41 6.67	74	1.61 14.84	508	5.86 7.24	60	4.56 9.48	69	3.33 6.72	28	4.82 4.58	42	4.35 4.22
MTOB	1376	0.34 2.07	-30.05	54.39	83	0.18 0.15	198	0.41 0.56	315	0.35 4.09	75	0.25 0.27	505	0.35 1.03	60	0.45 0.76	69	0.25 0.20	29	0.28 0.23	42	0.23 0.14
TOBIQ+3	1372	1.85 1.06	0.52	7.18	83	1.62 0.91	198	2.31 1.46	313	1.77 0.81	74	1.82 1.13	505	1.82 0.99	60	1.71 1.27	68	1.78 1.11	29	1.78 0.97	42	1.48 0.42
TA	1382	13.63 1.79	8.65	18.81	83	14.09 1.76	198	13.56 1.69	315	13.58 1.79	75	13.69 2.16	511	13.52 1.64	60	14.82 1.76	69	13.44 1.97	29	13.93 2.42	42	12.93 1.79
LEV	1382	18.03 15.13	0.00	62.34	83	18.64 11.32	198	17.43 14.87	315	17.21 15.77	75	17.18 14.55	511	19.30 15.83	60	17.11 12.11	69	17.63 18.52	29	15.30 9.28	42	15.55 10.60
PBT	1382	8.16 9.73	-69.85	52.93	83	7.61 10.52	198	10.37 9.67	315	8.24 8.66	75	3.46 13.22	511	8.69 7.15	60	6.30 18.84	69	4.67 13.74	29	8.94 8.89	42	7.96 4.55
CAP_INT	1379	74.51 20.02	16.19	100.00	83	81.77 19.17	198	76.22 19.58	315	72.30 22.90	75	68.28 19.94	508	74.75 17.86	60	79.56 24.05	69	68.05 17.85	29	82.96 15.07	42	74.58 17.84
R&D_INT	1318	1.77 5.46	0.00	77.52	69	0.55 1.05	191	1.83 4.54	311	1.13 2.55	75	5.43 14.32	476	1.35 3.76	60	0.11 0.29	66	6.81 10.93	28	1.91 3.57	42	0.78 1.33
INV_INT	1374	11.77 14.97	0.00	93.27	83	12.97 12.99	198	13.81 18.20	312	12.34 13.56	74	12.81 20.89	508	11.40 15.51	60	5.41 6.29	69	8.90 8.20	28	12.43 6.69	42	11.67 11.24
GOV_SCO	1322	57.05 37.64	0.00	96.48	82	65.43 30.21	192	56.93 35.80	301	58.35 37.45	71	58.30 39.33	486	55.64 39.01	59	79.52 24.98	67	53.66 34.77	27	48.43 39.72	37	21.40 33.92
MULTI_LIST	1382	87%				100%		92%		85%		80%		86%		100%		62%		100%		100%

3.6.2 Mean Comparison: t tests

Table 3.3 presents t tests of the mean differences of tax planning with respect to international orientation, risk, free cash and firm growth. The objective is to respectively analyse the significance of the difference in the mean value of each measure of tax planning between the local and internationally oriented firms, firms with high and low risk, firms with high and low free cash, and firms with high and low growth. The results are presented in Table 3.3, where significance levels of 5% and 1% are shown as ** and ***, respectively.

Table 3.3 Panel A shows that local firms are engaged in comparatively higher disclosed and undisclosed tax planning than internationally oriented firms, although this difference between local and internationally oriented firms is not statistically significant. Total tax planning is significantly higher (coefficient 2.90*; t value 1.75) for local firms. Cross-listed firms are subject to multiple tax regimes and their scrutiny and thus are expected to be subject to stricter checks of their revenues and taxable profits. Moreover, internationally oriented firms might be subject to higher tax rates. Also, local firms can exercise more tax relief options, such as group relief (HMRC 2016a), which results in overall reduction of the total tax expenses. These findings are in line with my expectations and support hypothesis 1, although the differences are not significant for disclosed and undisclosed tax planning.

Panel B presents t tests comparing firms with below-median and above-median risk. The differences in tax planning means of total, disclosed and undisclosed tax planning between the above-median and below-median firms are not significant. Total tax planning (coefficient -0.57; t value -0.51), disclosed tax planning (coefficient 0.52;

t value 0.55) and undisclosed tax planning (coefficient -1.16; t value -1.06): this suggests that risk does not play a significant role when firms set their tax planning activities. These findings do not support hypothesis 2, which expects an association between tax planning and risk. However, the difference in the direction of the relationship between total and disclosed tax planning suggests some relevance of tax planning to a firm's risk.

Panel C presents t tests for a split of observations based on the median value of free cashflow level of firms. Total tax planning and undisclosed tax planning are significantly higher for firms with higher levels of free cash (coefficient -5.40***; t value -4.92 and coefficient -5.23***; t value -4.80, respectively). This indicates that firms with high (low) cashflows have engaged more (less) in tax planning, reporting tax expenses lower (higher) than STR and have further paid less (more) taxes than the reported expenses. This is in line with Koester et al. (2017) but against hypothesis H3 set in the current study.

Finally, Panel D presents t tests for a split based on the median market-to-book value of firms. Firms with higher growth show significantly higher total and undisclosed tax planning (coefficient -3.06*** & -3.55***; t value -2.80 & -3.20, respectively). This result is in line with Chen et al. (2010) and supports hypothesis 4 that growth is associated with tax planning. The results indicate significant association between international orientation and total tax planning, between total and undisclosed tax planning and cash flow level of firms and between total and disclosed tax planning and growth level of firms, respectively. These results however are based on the univariate analysis and thus do not consider further correlation with other relevant variables, which is considered in the regression models in the later sections.

Table 3.3 Mean comparison

This table shows t test results for total tax planning (TP_TOTAL), measured as the difference between the statutory tax rate and cash effective tax rate; disclosed tax planning (TP_DISC), measured as the difference between the statutory tax rate and the effective tax rate; undisclosed tax planning (TP_UNDISC), measured as the difference between the effective tax rate and the cash effective tax rate; share price volatility (VOLATILITY), measured as the annualised value of share price changes for 180 days; leverage (LEV), measured as the ratio of total debt to total assets; free cashflow (FREE_CASH), measured as net operating cashflows minus investments made; growth (MTOBOOK), measured as the ratio of market capitalisation to net assets; three months' lagged value of Tobin's Q (TOBINSQ+3); natural log of total assets (TA); profit before tax (PBT); capital intensity (CAP_INT), measured as the ratio of property plant and equipment to total assets; R&D intensity (R&D_INT), measured as the ratio of R&D expenditure to total assets; inventory intensity (INV_INT), measured as the ratio of inventory value to total assets; and governance score (GOV_SCO), collected from DataStream. Panel A presents t tests for summary statistics of LOCAL (firms listed on one stock exchange, which represent 13% of the sample), and CROSS_L (firms listed on more than one stock exchange, which represent 87% of the sample). Firms listed on one stock exchange are observed to have significantly (<10%) higher total tax planning (TP_TOTAL). Panel B presents t tests for firms with below-median returns volatility and firms with above-median returns volatility. There is no significant difference in tax planning variables between these groups. Panel C presents t tests for firms with below-median cash flow with firms with above-median cash flow. Total tax planning (TP_TOTAL) and undisclosed tax planning (TP_UNDISC) are significantly (<1%) lower for firms with below-median free cash flows than for firms with above-median free cash flows. Significance levels are presented as ***, ** and * for 1%, 5% and 10%, respectively.

Panel A International Orientation									
	Local 13%			Cross listed: 87%			t test Local - Cross		
	N	Mean	SD	N	Mean	SD	Mean	t val	Sig
TP4_TOTAL	175	1.61	20.51	1207	-1.29	20.43	2.90	1.75	*
TP1_DISC	175	1.36	21.88	1207	1.13	16.97	0.23	0.16	
TP3_UNDISC	175	0.25	20.04	1207	-2.25	20.34	2.50	1.52	

Panel B Volatility									
	Below Median			Above Median			Below - Above		
	N	Mean	SD	N	Mean	SD	Mean	t val	Sig
TP4_TOTAL	688	-1.21	19.19	694	-0.64	21.65	-0.57	-0.51	
TP1_DISC	688	1.42	12.71	694	0.90	21.47	0.52	0.55	
TP3_UNDISC	688	-2.52	18.92	694	-1.36	21.61	-1.16	-1.06	

Panel C Free Cash									
	Below Median			Above Median			Below - Above		
	N	Mean	SD	N	Mean	SD	Mean	t val	Sig
TP4_TOTAL	688	-3.62	23.98	686	1.78	15.86	-5.40	-4.92	***
TP1_DISC	688	1.11	21.67	686	1.17	12.53	-0.06	-0.06	
TP3_UNDISC	688	-4.54	24.56	686	0.69	14.56	-5.23	-4.80	***

Panel D Market-to-Book									
	Below Median			Above Median			Below - Above		
	N	Mean	SD	N	Mean	SD	Mean	t val	Sig
TP4_TOTAL	675	-2.44	22.86	674	0.62	16.84	-3.06	-2.80	***
TP1_DISC	675	1.67	20.75	674	0.81	13.61	0.86	0.90	
TP3_UNDISC	675	-3.77	23.53	674	-0.22	16.56	-3.55	-3.20	***

3.6.3 Correlation

Pairwise correlation is conducted to identify the strength and direction of the relationship between pairs of variables and to assess potential issues of multicollinearity in the regression analysis. The findings for the pairwise correlations are presented in Table 3.4, with significance levels shown as * for 10%, ** for 5% and *** for 1% significance levels. The Variance Inflation Factor (VIF) is also calculated to further assess multicollinearity issues.

The correlation results in Table 3.4 show an expected significant (at 1%) positive relationship of total tax planning TP_TOTAL with disclosed tax planning (TP_DISC) and undisclosed tax planning (TP_UNDIS). However, disclosed tax planning and undisclosed tax planning are inversely related, indicating that firms may choose whether to disclose more details of their tax planning activities or to keep them confidential, as further components of disclosed tax planning are presented in the income tax reconciliation as per IAS 12.

The three measures of tax planning are not significantly correlated with risk (VOLATILITY) or growth (MTOBOOK), suggesting that firm risk and growth play no part in firms' engagement with tax planning activities. Tax planning measures are significantly (at 1%) positively correlated with free cashflows (FREE_CASH), which is in line with Koester et al. (2017). Finally, total tax planning and undisclosed tax planning are significantly (at 1%) positively correlated with firm value (TOBINSQ+1) indicating tax planning activities resulting in reduced tax payments are positively contributing towards firms' value. On the other hand, disclosed tax planning is not

significantly correlated with firm value with a positive coefficient. These findings are in line with those reported by Graham and Tucker (2006)

Table 3.4 Pearson Correlation Matrix

This table shows Pearson correlation results for total tax planning (TP_TOTAL), measured as the difference between statutory tax rate and cash effective tax rate; disclosed tax planning (TP_DISC), measured as the difference between statutory tax rate and effective tax rate; undisclosed tax planning (TP_UNDISC), measured as the difference between effective tax rate and cash effective tax rate; share price volatility (VOLATILITY), measured as the annualised value of share price changes for 180 days; leverage (LEV), measured as the ratio of total debt to total assets; free cashflow (FREE_CASH), measured as net operating cashflows minus investments made; growth (MTOBOOK), measured as the ratio of market capitalisation to net assets; three-month lagged value of Tobin's Q (TOBINSQ+3); natural log of total assets (TA); profit before tax (PBT); capital intensity (CAP_INT), measured as the ratio of property plant and equipment to total assets; R&D intensity (R&D_INT), measured as the ratio of R&D expenditure to total assets; inventory intensity (INV_INT), measured as the ratio of inventory value to total assets; and governance score (GOV_SCO), collected from DataStream. Pearson correlation is presented between pairs, with significance level presented as ***, ** and * for 1%, 5% and 10% significance levels, respectively. Correlation between the three tax planning variables is significant at 1%, with a negative relationship between disclosed and undisclosed tax planning, suggesting that engaging in more of one is associated with less of the other.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1)TP_TOTAL													
(2)TP_DISC	0.42***												
(3)TP_UNDIS	0.62***	-0.44***											
(4)VOLATILITY	0.00	0.01	-0.01										
(5)FREE_CASH	0.16***	0.06***	0.10***	-0.15***									
(6)MTOBOOK	0.02	-0.01	0.03	0.01	0.05**								
(7)TOBINSQ+1	0.08***	0.00	0.08***	-0.16***	0.45***	0.88***							
(8)TA	-0.02	0.03	-0.05*	-0.25***	-0.03	-0.19***	-0.14***						
(9)LEV	-0.08***	-0.02	-0.07***	-0.13***	-0.12***	0.02	-0.14***	0.41***					
(10)PBT	0.34***	0.14***	0.22***	-0.22***	0.60***	0.51***	0.50***	0.01	-0.15***				
(11)CAP_INT	0.10***	-0.02	0.12***	0.08***	-0.13***	0.01	0.01	-0.10***	-0.07***	0.07***			
(12)R&D_INT	-0.04	0.03	-0.06**	0.12***	-0.21***	0.26***	0.20***	-0.21***	-0.21***	-0.26***	-0.07***		
(13)INV_INT	0.09***	-0.02	0.10***	0.11***	-0.03	-0.02	-0.04	-0.07***	-0.25***	0.08***	0.27***	-0.10***	
(14)GOV_SCO	0.01	0.04	-0.02	-0.17***	0.10***	0.04	0.07***	0.69***	0.26***	0.07***	-0.07***	-0.10***	-0.03

3.6.4 Incentives for tax planning

Table 3.5 reports the regression results for tax planning incentives. International orientation affects negatively Total Tax Planning (TP_TOTAL) and undisclosed tax planning (TP_UNDIS), significant at the 1% significance level. Interestingly, international orientation does not seem to affect disclosed tax planning (TP_DISC).

These results suggest that internationally oriented firms report fewer tax expenses than their statutory tax rate but do pay more taxes than they report. This overall negative association with total tax planning is in line with my expectation in hypothesis 1.

This finding is contrary to the existing literature (Mills et al. 1998; Rego 2003; Kraft 2014), which finds a positive association between tax planning and international orientation. The difference in results may be explained by the firms that are subject to lower corporation tax rates in the foreign regimes as opposed to their domestic tax rates. Hence, firms in those studies have the opportunity to reduce their overall corporation tax liability by benefiting from lower foreign tax rates. However, the UK corporation tax rate is among the lowest end of corporation tax rates in the OECD member countries (OECD 2019). Hence, internationally oriented UK firms are exposed to higher foreign tax rates, resulting in a significant negative relationship. My findings are further in line with HMRC's reports of reductions in their tax gap, which is the difference between the expected tax collections and the actual tax collections (HMRC 2016b).

The main implications of the above discussed findings are that UK-based, internationally oriented (local) firms report less (more) taxes than what is suggested by their statutory tax rate, but their actual tax payments are larger. Hence, internationally oriented firms opt to report and signal better after-tax earnings on multiple stock exchanges, while local firms are more concerned with saving actual funds.

Risk is not significantly related to total tax planning (coefficient of 0.04), disclosed tax planning (coefficient of 0.03), or undisclosed tax planning (coefficient of 0.02). These findings do not support my hypothesis 2, and hence I reject this hypothesis. These findings are not in line with Balakrishnan et al. (2019) or Hope et al. (2013), who concluded that risky firms engage in less tax planning to reduce any information asymmetry. These findings are also not in line with signalling theory expectations, since firms with larger market perceived risk are expected to engage in less tax planning to prevent further increases in the perceived risk.

A possible explanation for the positive association found, although not statistically significant, could be the limitation of funding options for risky firms in the post-financial-crisis period, as concluded by Vithessonthi and Tongurai (2015), where tax planning is an internal source of funding enabling risky firms to have access to funds with comparatively fewer implications on their financial performance and position. Moreover, non-association of tax planning activities with firms' overall risk, as found by Guenther et al. (2017), also supports this positive association. To further verify these findings, the risk measure is replaced with beta (i.e. the systematic risk of firms), and the results persist. These findings provide evidence that firm risk does not impact on the tax planning activities of firms in the UK. A possible reason for this could

be that the risk associated with engaging in tax planning activities, as discussed by Balakrishnan et al. (2019) and Hope et al. (2013), is not considered in the overall risk profile of UK firms. Hence, risky firms do not reduce their tax expenses and tax payments to signal less engagement in risky tax planning activities. Further research on risk associated with tax planning and its relevance to the overall firm-level risk may provide further insight to my findings.

Free cash flows are not significantly associated with total tax planning (coefficient of -0.14), disclosed tax planning (coefficient of -0.08) and undisclosed tax planning (coefficient of -0.07). The negative direction of this relationship is in line with hypothesis H3; however, I reject this hypothesis, as my findings are not statistically significant. This result is in line with Kraft (2014) and with my expectations, as firms with low cash flows would see any reduction in tax payments as a source to improve cash flows and hence would engage in tax planning activities to benefit from this source.

My findings are contrary to those reported by Koester et al. (2017), who argue that firms with higher cash flow levels have more availability of funds and thus can invest in tax planning activities. A possible explanation for my results could be that firms maintain a targeted level of tax payments, balancing between their shareholders' and tax authorities' expectations (Scholes et al. 2014; Kim et al. 2019), and with the UK corporation tax rates reducing from 28% to 20% over the sample period (OECD 2019), tax reduction might not be a suitable option for investment.

The results in Table 3.5 suggest that growth is not significantly associated with total tax planning (coefficient of 0.13), disclosed tax planning (coefficient of -0.18), or

undisclosed tax planning (coefficient of 0.31). The negative association with disclosed tax planning suggests that growing firms report tax expenses in excess of the STR, which is in line with Kraft (2014), but my results are not statistically significant. However, this finding is not in line with Chen et al. (2010), who find a positive association between tax planning and growth because of the tax-deductible investments made by the growth firms. A possible explanation for this is that my regression models in Table 3.5 include the most common growth-related investment items, namely capital intensity and R&D intensity, which control for any systematic tax reliefs available with growth-related investments. Hence, the positive association between growth and tax planning found by Chen et al. (2010) corresponds with my significantly positive results for capital intensity and R&D intensity, presented in Table 3.5. The positive relationship with undisclosed (total) tax planning, although not significant, suggests that growing firms pay fewer taxes than their reported tax expense (STR) to possibly support their growth by arranging funds through this internal source.

The above findings support my expectations in relation with signalling theory that growing firms do not engage in tax planning to maintain a positive image for their regulators and investors and avoid tax-planning-related information asymmetry. Growth firms will have other projects to invest in instead of tax planning.

To summarise my key findings on incentives of tax planning: internationally oriented firms use tax planning activities to report higher after-tax profits by reporting fewer tax expenses, but they actually pay taxes in excess of the UK statutory rate; they thus have improved after-tax earnings due to the low tax expenses reported, better public image by not engaging in tax planning, and better relations with HMRC

by paying taxes in excess of the reported tax expenses and the statutory tax rates. On the other hand, HMRC reports better tax collections and a reduction in the tax gap – that is, shortfall in corporation tax collections as a percentage of total expected corporation tax (HMRC 2016b) – but this is mainly due to the decreasing tax rates in the UK. This corporation tax gap in monetary terms has broadly stayed constant over the time period. These findings show that tax planning activities are used by internationally oriented firms during the financially constrained post-financial-crisis period. Tax planning that can be used as an internal source of cash is not used by firms with low free cash flows, risky firms that may struggle to arrange funds externally or growing firms in need of funds to finance their growth. These findings indicate that the firms facing these challenges opted to signal their non-engagement in any tax planning activities. The public awareness and regulatory attention towards tax planning matters may have resulted in signalling this non-engagement. Moreover, the reducing corporation tax rates may have supported firms.

The results of Table 3.5 show that firm's size is not significantly related with any of the tax planning measures. However, it is interesting to analyse the sign of the coefficient, which indicates that size is positively related to disclosed tax planning but negatively related to undisclosed tax planning and to total tax planning. The negative association with undisclosed tax planning indicates that large firms pay tax in excess of what they report in their income statements. The positive association with disclosed tax planning indicates that large firms report fewer tax expenses in their income statements, hence reporting higher after-tax profits. The large firms do not significantly engage in any tax planning activities: this signals a positive contribution to the society

and the regulators and reduces any chances for further tax investigations by the tax authorities.

In line with the existing literature and my expectations, capital intensity (CAP_INT), R&D intensity (R&D_INT) and inventory intensity (INV_INT) have significantly positive associations (coefficient of 0.08*** with a t-statistic of 2.57; coefficient of 0.24*** with a t-statistic of 2.00; and coefficient of 0.08 with a t-statistic of 2.09, respectively) with total tax planning. Finally, governance score is not significantly associated (coefficient of 0.00 with t-statistic of 0.07) with total tax planning, but the direction of association is in line with the existing literature and with my expectations.

Table 3.5 OLS regression results for tax planning incentives

This table presents the results of OLS regression to estimate the impact of international orientation (MULTI_LIST), indicated by multiple stock exchange listings; risk (VOLATILITY), measured as annualised value of share price changes for 180 days; free cashflow (FREE_CASH), measured as net operating cashflows minus investments made; growth (MTOBOOK), measured as the ratio of market capitalisation to net assets on total tax planning (TP_TOTAL); disclosed tax planning (TP_DISC) and undisclosed tax planning (TP_UNDISC), as presented in Models 1, 2 and 3, respectively. Other control variables include leverage (LEV), measured as the ratio of total debt to total assets; the natural log of total assets (TA); profit before tax (PBT); capital intensity (CAP_INT), measured as the ratio of property plant and equipment to total assets; R&D intensity (R&D_INT), measured as the ratio of R&D expenditure to total assets; inventory intensity (INV_INT), measured as the ratio of inventory value to total assets, and governance score (GOV_SCO). Column (b) shows the expected sign based on the literature review. The four main independent variables are presented at the top of the table.

Independent variables	E.S.	Dependent variable= <i>Tax planning</i>		
		TP_TOTAL Model (1)	TP_DISC Model (2)	TP_UNDISC Model (3)
MULTI_LIST	(+/-)	-3.71** (-2.06)	1.36 (0.81)	-4.79** (-2.51)
VOLATILITY	(+ /-)	0.04 (0.94)	0.03 (0.66)	0.02 (0.41)
FREE_CASH	(-)	-0.14 (-1.39)	-0.08 (-0.91)	-0.07 (-0.63)
MTOBOOK	(+/-)	0.13 (0.43)	-0.18 (-0.67)	0.31 (0.99)
LEV	(-)	0.01 (0.26)	0.02 (0.53)	-0.02 (-0.49)
TA	(+)	0.38 (0.8)	0.68 (1.53)	-0.32 (-0.64)
PBT	(+)	0.73*** (9.39)	0.33*** (4.61)	0.39*** (4.75)
CAP_INT	(-)	0.08*** (2.57)	-0.03 (-0.98)	0.1*** (3.32)
R&D_INT	(-)	0.24** (2)	0.33*** (3.05)	-0.09 (-0.75)
INV_INT	(+)	0.08** (2.09)	0.01 (0.02)	0.07* (1.68)
GOV_SCO	(+)	0.02 (0.07)	0.03 (-0.18)	0.01 (0.51)
Industry-fixed effects		YES	YES	YES
Year-fixed effects		YES	YES	YES
F-statistics		10.51*** (24)	3.63*** (24)	4.59*** (24)
Mean VIF		2.51	2.51	2.51
Maximum VIF		8.45	8.45	8.45
Firm-year observations		1220	1220	1220
Adjusted R ²		15.77%	4.93%	6.60%

Table 3.6 reports regression results for firm value, using total, disclosed and undisclosed tax planning in Models 4, 5 and 6, respectively. As shown in Table 3.6, firm value is negatively related to total tax planning (coefficient of -0.003) and disclosed tax planning (coefficient of -0.0043), and these results are statistically significant at the 1% significance level. The results show that during the financially constrained period following the 2008 financial crisis, the UK market negatively valued firms' engagements in tax planning activities, which resulted in reduced tax expenses and tax payments (when compared with the STR). These findings are in line with the research findings of Abdul Wahab and Holland (2012) and my hypothesis 5: that is, that the firm value of UK firms is negatively associated with tax planning.

However, my findings are not in line with the US-based findings of Desai and Dharmapala (2009). It is interesting to note that the relationship between firm value and undisclosed tax planning is positive (coefficient of 0.0002), although it is not significant, which indicates market value payment of taxes below the tax expenses reported in the income statement. A possible reason for this result could be that undisclosed tax planning is not separately reported by firms. Although both disclosed and undisclosed tax planning are included in the combined measure of total tax planning, only the former is disclosed in the income statement.

The main regulatory implication of my findings is for the tax authorities to promote market awareness about firms' tax planning activities to maintain this potential deterrent to tax planning (i.e. negative valuation of tax planning activities). Moreover, the market should be further informed about tax planning activities beyond tax expense reduction (i.e. the undisclosed part of the total tax planning), so that it can develop a negative valuation attitude towards all types of tax planning activities. My

findings suggest that the market compares the reported tax expenses and the tax payments of firms with the STR to inform their valuation but ignore the relationship between the reported tax expenses and tax payments, which may reveal further information on tax planning activities being pursued by a firm.

Firm value is not significantly associated with international orientation, significantly negatively associated with risk or positively associated with free cash flows. No further analysis on these findings is deemed necessary, as they are outside the scope of the current study.

3.6.5. Further analysis and robustness checks

To further analyse the specific tax planning activity adopted by firms, the income tax reconciliation, as per IAS 12, reported in the notes section of financial statements is used. The reconciliation provides details on items that resulted in any difference between STR and ETR. A detailed illustration of income tax disclosures is given in Appendix A. Items included in the reconciliation are not standard items set by IAS 12, but these are disclosed by firms differently.

These items are summarised in seven different categories: (1) permanent differences (PD), representing the tax result of any differences between tax and accounting regulations, such as entertainment expenses not allowed for tax purposes but included as expenses in the income statement; (2) loss relief (LR), representing the tax result of any previous periods' loss used to reduce the current year's taxable profits, as losses can be carried forward for an indefinite period of time to be set against any future profits from the same trade; (3) overseas tax difference (OSTRD),

representing the tax impact on ETR of any tax rate differences in other countries in which the firms trades; (4) research credits (RC), resulting in the reduction of tax expense down to ETR; (5) prior year tax adjustments (PYTADJ), representing any adjustments made in tax reported in previous years; (6) deferred tax adjustments (DTADJ), representing adjustments in deferred tax previously recognised; and (7) uncategorised items (UNC), which represents any items reported as ‘others’ in the reconciliation. These categories are mostly in line with the existing literature (Abdul Wahab and Holland 2012). Exceptions are items (5) and (6), which are specifically selected to analyse cashflow-relevant tax planning strategies, as these two items represent adjustments in accounts with no real cash implications in terms of tax payments.

Regression Model 7, the results of which are presented in Table 3.6, further analyses the above seven components of disclosed tax planning and their association with firm value.

$$\begin{aligned}
 TOBINSQ_{it+1} = & \beta_0 + \beta_1 PD_{it} + \beta_2 LR_{it} + \beta_3 OSTRD_{it} + \beta_4 RC_{it} + \beta_5 PYTADJ_{it} \\
 & + \beta_6 DTADJ_{it} + \beta_7 UNC_{it} + \beta_8 MULTI_LIST_{it} + \beta_9 VOLATILITY_{it} \\
 & + \beta_{10} FREE_CASH_{it} + \beta_{11} LEV_{it} + \beta_{12} TA_{it} + \beta_{13} PBT_{it} + \beta_{14} R\&D_{it} \\
 & + \beta_{15} CAP_INT_{it} + \beta_{16} INV_INT_{it} + \beta_{17} GOV_SCO_{it} \\
 & + \sum_{n=1}^9 \beta_n IND_DUM_{it} + \sum_{n=1}^6 \beta_n YEAR_DUM_i + \varepsilon_{it}
 \end{aligned}$$

Equation 7

where PD represents permanent differences, LR represents loss relief, OSTRD represents overseas tax rate differences, RC represents research credits, PYTADJ represents prior year tax adjustments, DTADJ represents deferred tax adjustments and UNC represents uncategorised items. These seven items are computed from tax

disclosures and used as ratios of PBT. All other variables in this model are the same as in the previous models. All continuous variables are winsorized at the 1st and 99th percentiles to mitigate the effect of outliers.

The results for Model 7, presented in Table 3.6, show that firm value is significantly and negatively associated with prior year tax adjustments (PYADJ), at 1% (coefficient of -0.009 and t-statistic of 2.95); permanent differences (PD), at 10% (coefficient of -0.005 and t-statistic of -1.92); overseas tax rate difference (OSTRD), at 10% (coefficient of -0.005 and t-statistic of -1.71); and uncategorised (UNC) differences, at 10% (coefficient of -0.004 and t-statistic of -1.64). A possible explanation for these four components of disclosed tax planning negatively valued by the market could be the lack of information disclosed regarding these items compared with the other three components, namely loss relief (LR), research credits (RC), and deferred tax adjustment (DTADJ), which do not contribute significantly towards the negative association of disclosed tax planning with firm value. Moreover, another possible reason why these three components of disclosed tax planning do not appear significant could be the nature of these components: that is, they are available to firms via tax regulations and tax reductions (HMRC 2007a, 2012; OECD 2019). The significant association of firm value with overseas tax rate difference further confirms the negative association with international orientation found in regression Model 5, as presented in Table 3.5. So, shareholders have negatively valued the overseas tax rate difference. In regression Model 7, firm value is associated with other firm characteristics, similar to regression Model 5.

Table 3.6 OLS regression results for the impact of tax planning on market value

This table presents the results of OLS regression to estimate the impact of total tax planning (TP_TOTAL), disclosed tax planning (TP_DISC) and undisclosed tax planning (TP_UNDISC) on firm market value, measured as three months' lagged value of Tobin's Q, respectively. Other control variables include: international orientation (MULTI_LIST), indicated by multiple stock exchange listings; risk (VOLATILITY), measured as annualised value of share price changes for 180 days; leverage (LEV), measured as a ratio of total debt to total assets; free cashflow (FREE_CASH), measured as net operating cashflows minus investments made; natural log of total assets (TA); profit before tax (PBT); capital intensity (CAP_INT), measured as the ratio of property, plant and equipment to total assets; R&D intensity (R&D_INT), measured as the ratio of R&D expenditure to total assets; inventory intensity (INV_INT), measured as the ratio of inventory value to total assets, and governance score (GOV_SCO) collected from Datastream. Model 7 gives the detailed variables that aggregate TP-DISC under Model 5. These variables include permanent differences (PD), representing the tax result of any differences between tax and accounting regulations such as entertainment expenses not allowed for tax purposes but included as expenses in the income statement; loss relief (LR), representing the tax result of any previous periods' loss used to reduce the current year's taxable profits, as losses can be carried forward for an indefinite period of time to be set against any future profits from the same trade; overseas tax difference (OSTRD), representing the tax impact on ETR of any tax rate differences in other countries in which the firms trades; research credits (RC), resulting in reduction of tax expense down to ETR; prior year tax adjustments (PYTADJ), representing any adjustments made in tax reported in previous years; deferred tax adjustments (DTADJ), representing adjustments in deferred tax previously recognised, and uncategorised items.

<i>Dependent variable = firm value (TOBINSQ)</i>				
<i>Independent variable</i>	Model (4)	Model (5)	Model (6)	Model (7)
TP_TOTAL	-0.003*** (-2.82)			
TP_DISC		-0.0043*** (-3.31)		
TP_UNDIS			0.0002 (0.19)	
VOLATILITY	-0.007*** (-3.73)	-0.0066*** (-3.74)	-0.0068*** (-3.8)	-0.007*** (-3.67)
MULTI_LIST	-0.093 (-1.25)	-0.077 (-1.04)	-0.0775 (-1.04)	-0.081 (-1.08)
LEV	0.0048*** (2.65)	0.00487*** (2.68)	0.0048*** (2.63)	0.005*** (2.65)
FREE_CASH	0.0364*** (9.04)	0.03648*** (9.07)	0.0369*** (9.14)	0.037*** (9.05)
TA	-0.178*** (-9.04)	-0.1763*** (-8.97)	-0.1789*** (-9.07)	-0.176*** (-8.89)
PBT	0.0473*** (14.3)	0.04623*** (14.4)	0.0448*** (13.8)	0.046*** (13.83)
CAP_INT	0.0027** (2.2)	0.00229* (1.9)	0.0024** (1.96)	0.002* (1.79)
R&D_INT	0.0739*** (15.22)	0.07452*** (15.3)	0.0732*** (15)	0.075*** (152)
INV_INT	-0.002 (-1.32)	-0.0024 (1.49)	-0.0024 (-1.49)	-0.002 (-1.42)
GOV_SCO	0.0063*** (7.39)	0.00626*** (7.38)	0.0063*** (7.34)	0.006*** (7.33)
PD				-0.005* (-1.92)
LR				-0.004 (-1.4)
OSTD				-0.005* (-1.71)
RC				-0.005 (-1.27)
PYTADJ				-0.009*** (-2.95)
DTADJ				-0.003 (-1.14)
UNC				-0.004* (-1.64)
Industry-fixed effects	YES	YES	YES	YES
Year-fixed effects	YES	YES	YES	YES
F-statistics	52.7*** (24)	52.33*** (24)	51.40*** (24)	41.92*** (30)
Mean VIF	2.53	2.52	2.52	2.26
Maximum VIF	1.53	1.21	1.11	1.16
Firm-year observations	1216	1216	1216	1216
Adjusted R ²	50.22%	50.34%	50.88%	50.29%

Since the tax rates in the UK changed over the research period, further analysis is conducted to test regression models 1, 2 and 3 annually and thus the robustness of my results to changes in the tax rate. Those results are presented in Table 3.7 and are very useful in understanding the impact of the main variables on tax planning by disaggregating the impact of differences in statutory tax rates included in the combined analyses in Models 1 to 7, presented in Tables 3.5 and 3.6.

Internationally oriented firms negatively and significantly engage in total tax planning (coefficient of -3.71** with t-statistic of -2.06): this analysis, presented in Table 3.5, shows a positive association for 2010 only and a negative association for the rest of the sample period that is significant only for 2011 (coefficient of -5.96* with t-statistic of -1.78) and 2013 (coefficient of -8.7** with t-statistic of -2.16). For the rest of the years (i.e. 2012, 2014 and 2015), the internationally oriented firms do not significantly engage in total tax planning. Through this negative engagement and non-engagement in total tax planning, internationally oriented firms continuously signal a positive tax contribution to the market and regulators over the five-year period (2011-2015). Similarly, internationally oriented firms negatively and significantly engage in undisclosed tax planning (coefficient of -4.79** with t-statistic of -2.51). This finding, presented in Table 3.5, can be explained by the negative engagement in undisclosed tax planning in 2013 (coefficient of -10.08 with t-statistics of -2.24) and 2015 (coefficient of -8.64 with t-statistics of -1.68), both significant at 5% and 10%, respectively.

Risky firms are not significantly involved in any form of tax planning, as presented in Table 3.5; however, the relationship is positive, which is against my expectations. Table 3.7 shows that risky firms are negatively associated with total tax

planning and also with undisclosed tax planning for 2010, 2011 and 2012. This association switches to positive for 2013, 2014 and 2015, and is significantly positive, at 1% in 2013 with total tax planning (coefficient of 0.24 with t-statistic of 2.71) and undisclosed tax planning (coefficient of 0.26 with t-statistic of 2.6).

Firms with higher free cashflows are less engaged in tax planning for all three measures, though this association is not statistically significant overall, as shown in Table 3.5. However, Table 3.7 reveals that this negative association of cashflows with total tax planning is significant (at 1%) for 2010 (coefficient of -0.55 with t-statistic of -1.8) and 2013 (coefficient of -0.74 with t-statistic of -2.94), and the negative association with undisclosed tax planning is significant for 2011 (coefficient of -0.45 with t-statistic of -2.39) and 2013 ($p < 10\%$ and coefficient of -0.47* with t-statistic of -1.68). Interestingly, free cashflow is positively associated with disclosed tax planning ($p < 1\%$ and coefficient of 0.42 with t-statistic of 2.06), which indicates that the availability of cash is associated with firms' confidence in reporting tax planning: the firms may have engaged in better tax planning mechanisms, such as the use of tax consultants.

Finally, growing firms engage more in total and undisclosed tax planning, as shown in Table 3.5, and this positive association is present for each of the sample years except 2015, where the association changes to negative, indicating a possible change in growing firms' approach towards tax planning, with a reduction in corporation tax rates. This observation is neither statistically significant nor sufficiently consistent to suggest a definite shift in the tax planning approach of growing firms. A further analysis beyond the sample period may reveal further evidence for this shift.

Table 3.7 Yearly OLS regression results of the incentives of tax planning

This table presents the results of regression Models 1,2 and 3, run separately for each sample year, which are set to estimate total tax planning (TP_TOTAL), disclosed tax planning (TP_DISC) and undisclosed tax planning (TP_UNDISC), respectively; the findings are presented in columns c, d and e in this table, respectively. The variables used to estimate tax planning, shown in column (b), are international orientation (MULTI_LIST), indicated by multiple stock exchange listings; share price volatility (VOLATILITY), measured as annualised value of share price changes for 180 days; leverage (LEV), measured as the ratio of total debt to total assets; free cashflow (FREE_CASH), measured as net operating cashflows minus investments made; growth (MTOBOOK), measured as the ratio of market capitalisation to net assets; three months' lagged value of Tobin's Q (TOBINSQ+3); natural log of total assets (TA); profit before tax (PBT); capital intensity (CAP_INT), measured as the ratio of property plant and equipment to total assets; R&D intensity (R&D_INT), measured as the ratio of R&D expenditure to total assets; inventory intensity (INV_INT), measured as the ratio of inventory value to total assets; and governance score (GOV_SCO) collected from DataStream. Column (b) shows the expected sign based on the literature review. The four main independent variables are presented at the top of the table.

a Independent variables	b E.S	Dependent variable=Tax planning																	
		TP_TOTAL Model (1)					TP_DISC Model (2)					TP_UNDISC Model (3)							
		2010	2011	2012	2013	2014	2015	2010	2011	2012	2013	2014	2015	2010	2011	2012	2013	2014	2015
MULTI_LIST	(+/-)	6.22 (1.09)	-5.96* (-1.78)	-6.21 (-1.61)	-8.7** (-2.16)	-1.62 (-0.34)	-4.63 (-0.88)	3.57 (0.56)	-3.07 (-0.77)	-1.5 (-0.45)	1.63 (0.39)	4.51 (1.06)	4.5 (1.34)	3.44 (0.57)	-3.11 (-0.83)	-4.63 (-1.16)	-10.08** (-2.24)	-5.35 (-1.07)	-8.64* (-1.68)
VOLATILITY	(+ /-)	0 (-0.03)	-0.02 (-0.26)	-0.03 (-0.32)	0.24*** (2.71)	-0.21 (-1.12)	0.01 (0.07)	0.03 (0.28)	0.2** (2.41)	0.02 (0.24)	-0.01 (-0.11)	-0.47*** (-2.71)	-0.14 (-1.07)	-0.02 (-0.21)	-0.22*** (-2.82)	-0.05 (-0.52)	0.26*** (2.6)	0.27 (1.31)	0.16 (0.81)
FREE_CASH	(-)	-0.55* (-1.8)	0 (0)	0.04 (0.18)	-0.74*** (-2.94)	-0.18 (-0.58)	0.11 (0.41)	-0.57 (-1.64)	0.42** (2.06)	-0.23 (-1.09)	-0.28 (-1.07)	-0.1 (-0.37)	-0.09 (-0.52)	0.01 (0.02)	-0.45** (-2.39)	0.31 (1.22)	-0.47* (-1.68)	-0.14 (-0.42)	0.19 (0.7)
MTOBOOK	(+/-)	0.5 (0.38)	0.37 (0.15)	0.12 (0.36)	1.87 (1.19)	-0.19 (-0.19)	-2.11 (-0.66)	0.07 (0.05)	-0.38 (-0.13)	-0.25 (-0.89)	-0.96 (-0.59)	-0.39 (-0.45)	-0.09 (-0.05)	0.43 (0.31)	0.36 (0.13)	0.37 (1.11)	2.72 (1.55)	0.27 (0.26)	-1.85 (-0.59)
LEV	(-)	0.17 (1.41)	0.08 (0.87)	0.02 (0.23)	-0.07 (-0.7)	0.06 (0.46)	-0.13 (-0.91)	-0.03 (-0.23)	0.17 (1.54)	-0.02 (-0.2)	0.09 (0.81)	0.12 (0.99)	-0.2** (-2.26)	0.17 (1.3)	-0.08 (-0.82)	0.04 (0.4)	-0.16 (-1.4)	-0.08 (-0.58)	0.05 (0.39)
TA	(+)	0.86 (0.66)	0.22 (0.24)	-0.17 (-0.16)	0.29 (0.26)	-1.37 (-0.96)	1.41 (0.92)	1.97 (1.34)	-0.6 (-0.56)	-0.16 (-0.17)	-0.55 (-0.47)	-0.11 (-0.09)	1.32 (1.34)	-1.08 (-0.78)	0.74 (0.74)	-0.01 (-0.01)	0.74 (0.6)	-1.2 (-0.8)	0.12 (0.08)
PBT	(+)	0.9*** (3.21)	0.47*** (2.82)	0.49*** (2.59)	1.06*** (5.98)	0.89*** (3.89)	0.72*** (3.42)	0.72*** (2.29)	-0.12 (-0.59)	0.2 (1.19)	0.31* (1.69)	0.33 (1.6)	0.35*** (2.61)	0.14 (0.47)	0.63*** (3.38)	0.25 (1.29)	0.73*** (3.71)	0.58** (2.43)	0.36* (1.76)
CAP_INT	(-)	0.13 (1.53)	0.09 (1.52)	0.03 (0.44)	-0.06 (-0.96)	0.04 (0.45)	0.25*** (3.01)	0.03 (0.36)	0.04 (0.56)	-0.03 (-0.49)	-0.04 (-0.62)	0 (0.02)	-0.1* (-1.87)	0.1 (1.15)	0.04 (0.67)	0.07 (1.02)	-0.02 (-0.21)	0.04 (0.45)	0.34*** (4.17)
R&D_INT	(-)	0.16 (0.49)	0.1 (0.49)	0.34 (1.49)	0.47 (1.41)	-0.48 (-1.02)	0.72** (2.17)	0.64* (1.68)	0.2 (0.78)	0.1 (0.51)	0.11 (0.33)	0.42 (1)	0.71*** (3.34)	-0.44 (-1.23)	-0.05 (-0.2)	0.24 (1.02)	0.4 (1.08)	-0.76 (-1.56)	-0.06 (-0.17)
INV_INT	(+)	0.1 (0.95)	0.08 (1.05)	0.21** (2.47)	0.11 (1.25)	0.11 (1.05)	-0.11 (-0.98)	-0.04 (-0.36)	-0.04 (-0.44)	0 (-0.05)	0.05 (0.56)	0 (-0.04)	0.01 (0.18)	0.12 (1.03)	0.12 (1.42)	0.21** (2.37)	0.05 (0.51)	0.09 (0.84)	-0.13 (-1.19)
GOV_SCO	(+)	0 (-0.01)	0.02 (0.57)	0.04 (0.83)	0.03 (0.6)	0.02 (0.36)	-0.06 (-0.92)	-0.04 (-0.55)	0.04 (0.85)	-0.02 (-0.51)	0.04 (0.78)	0.02 (0.29)	-0.01 (-0.16)	0.04 (0.61)	-0.01 (-0.23)	0.06 (1.37)	0 (-0.02)	0.01 (0.12)	-0.05 (-0.77)
Ind.-fixed effects		YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
F-statistics		1.69 ** (19)	2.25*** (19)	1.72*** (19)	3.79 ** (19)	2.54*** (19)	2.68*** (19)	0.83 (19)	1.23 (19)	0.77 (19)	0.59 (19)	1.55* (19)	3.92*** (19)	13.1 (19)	2.44*** (19)	1.64** (19)	2.95*** (19)	1.55* (19)	1.73** (19)
Mean VIF		4.57	2.75	2.7	2.65	2.7	1.15	4.57	2.75	2.7	2.65	2.7	2.77	4.57	2.75	2.7	2.65	2.7	2.77
Maximum VIF		18.27	7.69	7.95	7.8	8.01	8.11	18.27	7.69	7.95	7.8	8.01	8.11	18.27	7.69	7.95	7.8	8.01	8.11
Firm-year obs		153	214	215	213	213	212	153	214	215	213	213	212	153	214	215	213	213	212
Adjusted R ²		7.91%	10.06 %	5.97%	20.00%	12.14 %	13.17 %	-2.11%	1.97%	-2.06%	-3.83%	4.70%	20.48 %	3.75%	11.38%	5.37%	14.89%	4.67%	6.20%

To summarise the findings on risky firms, firms with free cashflows and growth firms, the results for most of the years are not significant and the significant results are not all in line with the relative signs for these variables in Table 3.5, which indicates that risky firms, firms with free cashflows and growth firms signal their non-engagement in tax planning to the market.

3.7. Conclusion

This chapter analyses the incentives and value relevance of corporate tax planning of UK non-financial listed firms over a period of six years from 2010 to 2015, covering 1382 firm years. This chapter finds that internationally oriented firms engage in total tax planning as well as undisclosed tax planning by paying taxes in excess of the STR, as expected due to the decreasing corporation tax rates in the UK. This finding is against the existing public opinions, which are probably based on certain taxation-related cases in the press, suggesting that certain multinational firms pay taxes below STR. However, my findings reveal that internationally oriented firms were initially paying taxes below STR but this trend reversed in line with the reduction in STR in the UK. Hence, my findings to this extent are specific to the UK corporation tax regulations and provide UK evidence on firms engaging in tax planning to work towards a targeted tax expense.

On the other hand, no significant association is found between any measure of tax planning and firm risk, free cashflow position or firms' growth potential, indicating that UK firms do not engage in tax planning to pursue these three incentives. A possible explanation for these findings is the continuous reduction in corporation tax rates in the UK (OECD 2019), which may have supported firms with their relevant

needs and prevented them from significantly engaging in tax planning. These findings further suggest that UK listed firms refrain from engaging in tax planning to signal a positive contribution to the society and to avoid any bad publicity associated with tax planning in the press.

Moreover, the distinction between disclosed and undisclosed tax planning is useful in signalling theory framework, as the current study finds disclosed tax planning to be negatively valued by the market; however, the undisclosed planning is not considered by the market. Hence, a firm can report high tax expenses in the income statement (i.e. low disclosed tax planning), but then reverse this with higher undisclosed tax planning that is not considered by the market. This chapter further decomposes disclosed tax planning to seven components using disclosures provided under IAS12 'income tax'. This negative value is specifically associated with permanent differences between accounting profits and taxable profits, overseas tax rate differences, prior year tax adjustments and uncategorised differences reported by firms. These findings are a key contribution to the market appreciation of any tax planning disclosures in the UK and the tax planning techniques with higher associated information asymmetry valued negatively by the market. One possible implication of these findings is that UK domiciled firms should be encouraged to report their tax affairs domestically (i.e. in the UK) to have a positive impact on their market value. Moreover, this suggestion is even more sensible for UK domiciled firms working with targeted tax expenses (Scholes et al. 2014; Kim et al. 2019) in the era of decreasing corporate tax rates.

Moreover, the market does not value any known areas of tax planning, such as loss reliefs, research credits and deferred taxation, but negatively values any areas of

tax planning that increase information asymmetry. This further shows that the market considers any tax planning disclosures; hence, further disclosure should be made by firms to signal greater contributions towards their share of society in the form of taxes.

A limitation of this research is its reliance on published financial data in financial statements, while in the signalling theory context firms might provide non-financial disclosure to signal their engagement level and approach towards tax planning. While financial data analysis to measure tax planning and factors influencing tax planning – for example, risk – facilitates objective analysis, it is relevant to analyse pertinent management disclosures in financial statements and on official platforms. These disclosures may supplement or explain some of the findings of the analysis conducted based on reported financial results.

CHAPTER 4

IMPACT OF CORPORATE GOVERNANCE ON TAX PLANNING: AN INSTITUTIONAL THEORY PERSPECTIVE

4.1. Introduction

This chapter studies the impact of corporate governance on tax planning activities of firms in an institutional theory framework in response to the recent call for the need of wider external factors impacting tax planning (Kovermann and Velte 2019). Moreover, the limited evidence for the consideration of external factors does not include any UK studies. Continuing with the theoretical contribution in Chapter 3, this chapter conducts the tax planning research in an institutional theory framework. The unique corporate governance characteristics used in this chapter are the board's tax relevant characteristics measured as professional memberships and tax related past experience. These board characteristics have not been studied previously in relation with the tax planning research in the UK. This chapter provides first evidence of the impact of board members' professional membership of the Charter Institute of Taxation (CIOT) and their memberships of other professional accountancy institutes on firms' tax planning activities. This chapter makes important contributions to the literature with practical implications as explained further in this introduction section.

Tax scandals involving firms lead to increasing public awareness of listed firms' tax policies. The demand for strict governance on tax matters increased in line with the overall demand for improvements in corporate governance following the Enron

scandal in 2001. Tax relevant disclosures became mandatory in the EU (IAS 12)²³ and the US (FIN 48)²⁴ in 2005 and 2006, respectively, supporting the demand for further tax disclosures. However, a decade after the introduction of these disclosure requirements, it has been reported that tax collections from UK large firms are less than expected (HMRC 2020) despite the continuous reductions in corporation tax rates in the UK since 2010 (OECD 2019). This chapter makes important contributions to the existing literature and makes recommendations for HMRC and firms' management regarding tax planning relevant corporate governance mechanisms.

A recent report of the National Audit Office concludes that there is a need for further measures to tackle situations “where taxpayers bend the rules”, as this is one of the causes of the existing tax gap (NAO 2020). Another reason for the tax gap is that tax authorities have limitations in dealing with multinational firms due to their tax arrangements, which often stretch over multiple tax regimes involving a chain of overseas subsidiaries, going beyond the scope of the tax authority of a single country (Vella 2015). Moreover, multinational firms have access to a wide range of planning and financial resources that enable these firms to invest in any suitable tax-reducing activities. A comprehensive governance mechanism covering firms' tax matters may help tax authorities to ensure adherence to the tax regulations in their regimes. To support individual tax regimes, the Organisation of Economic Cooperation and Development (OECD) has initiated collective efforts between its member countries in

²³ International Accounting Standard 12 'income tax' has been adopted in the EU since 1st January 2005 and requires listed firms to provide a reconciliation between their nominal tax expense based on the statutory tax rate and the tax expense actually reported in the income statement for each period.

²⁴ Financial Accounting Standards Board Interpretation 48 requires firms to analyse and report income tax risks.

the form of a Base Erosion Profit Shifting (BEPS) Action Plan to prevent multinational firms from taking advantage of a country's tax limitations (OECD 2013).²⁵

These increasing involvements of external regulatory and monitoring institutions create the need to examine the impact of such involvement on tax planning and the extent to which both internal and external governance mechanisms might strengthen or weaken this impact (Baber et al. 2012). The literature largely studies the relationship of corporate governance with tax planning in an agency theory context, and in the current decade, there has been only one study addressing the impact of corporate governance on tax planning in the UK.²⁶ There are increasing pressures on UK firms as a result of the global financial crisis, substantial reductions in the UK corporation tax rates and regulatory changes from the OECD. Kovermann and Velte (2019) argue that the external regulatory institutions interact and work with the existing internal and external governance mechanisms, which cannot be fully comprehended by studying tax planning within an agency theory framework. This argument is supported by the institutional theory view that firms exist while interacting with other institutions and evolve due to various forces exerted by these institutions, namely regulatory forces, normative forces and memetic forces (Scott 2013).

HMRC is the main regulatory institution governing tax matters in the UK and it is indirectly supported by the Financial Reporting Council (FRC), which regulates

²⁵ Base Erosion and Profit Shifting (BEPS) refer to all those tax planning activities adopted by firms to take advantage of any loopholes and differences between taxation rules to make their taxable profits disappear within a single tax regime or shift their profits to locations with low or no taxes. The BEPS Action Plan launched by the OECD contains fifteen actions that target any venues and opportunities available to the firms to engage in BEPS and unfairly engage in tax planning (OECD 2013).

²⁶ For reviews, see Hanlon and Heitz 2010; Wilde and Wilson 2018; Kovermann and Velte 2019.

auditors and accountants and set up the corporate governance codes in the UK (FRC 2020). The tax and accountancy professional institutions governed by the FRC set their professional code of conduct and embed it in their qualifications and their members' training requirements. In line with Scott's (2013) explanation of normative and mimetic forces, associations with any of these institutions act as normative forces by promoting the ethical and professional behaviour of their members in their professional engagements, and the influence of wider interactions of the firms facilitate the mimetic forces. These external forces identified by institutional theory provide a distinctive framework to study the impact of external institutions on firms' tax planning activities, and this framework is adopted in the present study.

This chapter studies the impact of external corporate governance mechanisms on the tax planning activities of UK non-financial firms for a six-year period (2010-2015). Drawing its framework from the forces identified by institutional theory, the current study identifies the relevant external institutional influences on corporate governance mechanisms of a firm that may impact its tax planning activities. These corporate governance mechanisms interact with each other and substitute or complement each other (Weir et al. 2002; Baber et al. 2012): hence, the strength of governance in place in each firm may influence the impact of external institutional forces. To study this influence, the current study further analyses the impact of corporate governance mechanisms on strongly governed and weakly governed firms, making this distinction between firms based on board efficiency in line with Elshandidy and Neri (2015).

Tax planning is a strategic decision and the executive directors of a firm set "the tone at the top" (Desai and Dharmapala 2006; Dyreng et al. 2010), while the tax

directors formulate the strategy to achieve the strategic tax goals (Armstrong et al. 2012), and the board of directors governs the overall process (Armstrong et al. 2015). The board's tax expertise consists of the directors' affiliations with tax institutions, their previous tax experience and their accountancy qualifications (Dyreng et al. 2010; Taylor and Richardson 2014; Law and Mills 2017). These forms of expertise are channels for regulatory forces in the form of taxation updates from the tax affiliations, normative forces in the form of accountancy qualifications, and mimetic forces in the form of tax-related work experience. These forms of tax-related board expertise have not been studied in the UK context.²⁷

Changes in the accounting and reporting regulations (IAS 12) and national and international measures to control tax planning activities (from HMRC and OECD) require the board of directors to have collective tax expertise on the board. Maximising the shareholders' wealth is the ultimate objective of management that requires reducing expenses, including tax expenses. Thus, relevant tax expertise on the board should lead to the adoption of the most suitable tax planning strategies for the firm and prevent any strategies that are harmful for the business in the long run.

Statutory external audit is another external governance mechanism (Baber et al. 2012) that is a channel of regulatory forces ensuring compliance with tax-related accounting and reporting regulations. Auditor-Provided Tax Services (APTS) involve the formal engagement of auditors in a firm's tax planning activities, which may result in tax savings due to the "knowledge spill-over" (Cook et al. 2008; Armstrong et al.

²⁷ For a review, see Kovermann and Veltte 2019.

2012; Hogan and Noga 2015) or may lead the firm to engage less in tax planning for their clients to protect their image from the negative publicity associated with tax planning (Richardson et al. 2013; Klassen et al. 2016). These studies use APTS to evaluate auditors' role in tax planning, which, to the author's knowledge, has not been studied in the UK context.

Organisational values diffuse across organisations with their interactions with each other (Scott 2013) and institutional ownership of a firm's shares is a channel for such diffusion through influencing the decision-making process of the board, including any risky investments in tax planning (Armstrong et al. 2015). The government, investment companies and pension firms as institutional owners may interact to shape a firm's tax planning strategy in line with their own attitude towards tax planning. This interaction may form part of regulative, normative and/or mimetic forces, depending on the nature of the institutional investor and the size of shares' ownership. Completing the list of relevant external institutional factors, the current study analyses the impact of institutional ownership on tax planning.

The above-mentioned external institutional factors, namely tax affiliations, tax experience, accountancy qualifications (collectively referred to as board expertise), APTS and institutional ownership, set a wider scope of tax planning research in an institutional theory context that has not been studied previously, and a gap for such wider research exists (Kovermann and Velte 2019). The main motivation of the current study is to make a theoretical contribution to the tax planning research by studying the impact of corporate governance on tax planning in the UK in an institutional theory framework. By selecting the external institutional factors, the current study makes a number of further contributions.

Firstly, the board expertise as channels of external institutional influences and the tax planning skills on the board have not been studied in tax planning research in the UK. The previous tax planning research addressing such expertise in non-institutional theory context is non-UK-based (Kovermann and Velte 2019). This chapter finds that strongly governed firms with tax affiliated directors on the board engage more in tax planning, paying taxes below their Statutory Tax Rate (STR), while weakly governed firms report lower tax expenses in their income statements. Furthermore, weakly governed firms with professionally accountancy qualifications on the board pay taxes in excess of their STR. These findings provide the first evidence of its kind for the professional tax institutions about their affiliates' supportive role to tax planning.

Secondly, the current study contributes to the existing literature by analysing the involvement of statutory auditors as external institutions in providing tax planning services to their clients. In line with Garcia-Blandon et al. (2020), the current study finds a significant negative association between Auditor-Provided Tax Services (APTS) and tax planning, which suggests that auditors providing tax services for their audit clients negatively engage in their tax planning, resulting in tax payments in excess of their STR. This chapter further finds that APTS is not significantly associated with tax planning for strongly governed firms, suggesting that auditors' role in moderating tax planning is not significant when internal governance of their clients is strong. This finding confirms that governance mechanisms interact with each other, as suggested by Weir et al. (2002) and Baber et al. (2012), and in this case APTS supplement the internal governance quality.

Thirdly and finally, the current study contributes by using hand-collected data from income tax reconciliation to further study the specific tax planning activities adopted by firms in relation to their reported tax expenses.²⁸ The study finds that firms with tax affiliated directors on the board use prior year tax adjustments and other undisclosed items to reduce their tax expenses, and weakly governed firms with professionally qualified accountants pay taxes in excess of their STR due to permanent tax differences. Similarly, institutional ownership is significantly associated with activities leading to permanent tax differences.

This chapter shows that institutional ownership significantly reduces tax planning, in line with the existing literature (Chan et al. 2013; Khurana and Moser 2013; Bradshaw et al. 2019), and this negative association is significant for strongly governed firms. My findings suggest that institutional control significantly complements tax planning in the presence of internal governance quality, confirming Weir et al.'s (2002) suggestion of an interaction between governance mechanisms. This finding is in contrast with the APTS that supplement the governance quality.

This chapter has two important implications for the tax authorities: firstly, the positive (negative) association of tax planning with tax affiliations (accountancy qualifications) for the strongly (weakly) governed firms and non-association of tax experience with tax planning identify key tax expertise of a board that could be used by HMRC for an initial assessment to pick or ignore firms for further tax audits. This

²⁸ Listed firms are required to disclose a reconciliation between their Statutory Tax Rate (STR) and their Effective Tax Rate (ETR) under IAS 12 'income tax' (IASB 2010).

may help HMRC to better invest its resources to improve its objective of better value for money (NAO 2020). Secondly, the supplementary role of APTS to the internal governance quality provides evidence for HMRC to encourage the use of APTS for weakly governed firms to reduce firms' tax planning activities. These findings are also relevant for management in maintaining the board composition with desired tax expertise by having tax affiliates on the board and engaging auditors for APTS in a strongly governed environment to save tax expenses and reduce tax payments.

This chapter is structured as follows: the next section covers the theoretical and institutional considerations. Section 3 discusses relevant literature on tax planning and formulates the research hypotheses. Section 4 introduces the research methodology. Section 5 gives the empirical results, provides further analysis, and conducts some robustness checks. Section 6 concludes, identifies limitations, and suggests some avenues for future research.

4.2. Theoretical and institutional considerations

Institutional theory suggests that organisations' policies are not only regulated by the relevant legislative factors but are also shaped by various environmental factors around them. These factors have been extensively studied, leading to three organisational components, namely regulative systems, normative systems and cultural-cognitive systems (Scott 2013). Different strategies adopted by organisations are motivated and influenced by these three systems, which interact with each other based on the relevant strength of each component within an organisation. The initial discussions on institutional theory can be traced back to the work of Silverman and Silverman (1971), which is followed by a wide range of research, including the

identification of coercive, normative and mimetic forces acting within each system (DiMaggio and Powell 2000). Through these forces, organisations achieve homogeneous values and norms within themselves, called isomorphism, which then diffuse to achieve an isomorphic state within the organisations in the same field (Scott 2013)

Clear legislations in an area lead to isomorphism through coercive forces, as in the case of tax evasion, while vague guidelines are interpreted and adopted differently by organisations and spread through mimetic forces, as in the case of tax planning – both result in lower tax bills, but only the former are illegal (HMRC 2020). Normative forces can be associated with professional affiliations and qualifications, which often require compliance with Continuing Professional Development (CPD) requirements and declaration of compliance. It is important to note that coercive and normative forces originate and operate through defined legislative and professional channels, while mimetic forces operate through wider interactions between organisations. Organisations form, shape and diffuse through the respective strength of each of these three forces (Scott 2013).

The above-mentioned forces operate through individuals within organisations generally to achieve isomorphism for social norms as well as through individuals with key roles within organisations: for example, through a company secretary to comply with legislative corporate requirements and through a professional accountant to comply with the normative professional code. Moreover, individuals with key decision-making roles within organisations, such as the members of a company's board of directors, are subject to mimetic forces due to their professional or social interaction

with individuals. Moreover, any strategic-level norms and practices will diffuse across organisations through individuals with strategic roles within organisations.

Firms adopt different tax planning strategies to achieve their targets (Guenther et al. 2017) and they follow the market trends to avoid becoming an outlier in terms of their tax planning activities (Armstrong et al. 2019). Thus, it is important to study firms' board members' relations with other organisations (exposure to mimetic forces) and their affiliations with professional institutions (exposure to normative forces) in addition to the regulatory requirements (coercive forces). In addition to these three external relations of board members (collectively referred to as tax expertise), acting as channels of institutional forces, a firm's auditors' engagement in formulating its tax planning strategy is another channel of external institutional forces influencing the firm's tax planning activities. The auditors are regulated by the FRC and have memberships of professional institutions that make auditors an independent channel of all three external forces identified by institutional theory. Auditors are an independent governance mechanism (Baber et al. 2012) and they review their clients' tax planning activities as part of their statutory role even if they are not engaged in formulating their tax planning strategies that interact with other governance mechanisms in a firm, as suggested by Weir et al. (2002). Similarly, external institutional investors are a component of the overall governance mechanism (Dong and Ozkan 2008) and it is a channel for all forces identified by institutional theory.

The above-mentioned directors' tax expertise, auditors' engagement in tax planning and external institutional ownership provide a framework of external institutional forces that influence firms' corporate governance mechanisms in an institutional theory context. Acknowledging the interaction between external and

internal governance mechanisms proposed by Weir et al. (2002) and Baber et al. (2012), this research further studies the impact of these external governance mechanisms in strongly and weakly governed internal governance environments. Institutional theory has been used to study tax morale in various tax jurisdictions (Horodnic Ioana 2018).²⁹ However, corporate tax planning studies have been mainly conducted within an agency theory context and the institutional environment surrounding firms has not been considered.³⁰

4.3. Relevant literature and hypothesis development

4.3.1 Relevant literature

Tax research has initially focussed on understanding any impact of firm characteristics on the reported tax expenses and the actual tax payments (e.g., Gupta and Newberry 1997; Holland 1998). Any variation between the reported tax expenses and the statutory tax rates were studied as an outcome of various firm characteristics and the management decisions affecting these characteristics which ultimately result in these variations. The first strand of this research investigates the tax-book differences arising from the differences between tax and accounting regulations (e.g., Cloyd et al. 1996; Mills and Newberry 2001). A key feature of this initial tax research is its view on

²⁹ Tax morale is defined as the intrinsic motivation of a taxpayer to pay tax (Torgler and Schneider 2007).

³⁰ For a review, see Kovermann and Veltte 2019.

tax expenses as an outcome of firm characteristics and tax regulations, with management playing no active role in engaging in any tax planning activities.

The second strand of literature studies the management role in tax expense variations and attempts to associate the entire sum or a portion of any tax expense variation with management active engagement – this results in a variation in terms used by different researchers, including ‘tax planning’, ‘tax management’, ‘tax avoidance’ and ‘aggressive tax planning’ (Hanlon and Heitzman 2010). Further studies were conducted to find associations between managers’ background and tax aggressiveness (Dyregang et al. 2010) and between managers’ compensation contracts (Phillips 2003; Armstrong et al. 2012; Rego and Wilson 2012) and tax planning.

There are mixed findings on the association between tax planning and corporate governance, depending upon the corporate governance characteristic(s) and the tax planning measure(s) used. Desai and Dharmapala (2009) argue that strong corporate governance facilitates tax planning by controlling the agency problem. Their study, being one of the first on the issue, is used in the later research (Hanlon and Heitzman 2010; Abdul Wahab and Holland 2012; Wilde and Wilson 2018), and this argument is challenged by the contention that in weakly governed environments, managers have more opportunities and motivation to engage in tax planning for their personal benefit due to the lack of transparency associated with tax planning activities (Armstrong et al. 2015). Minnick and Noga (2010) and Rego and Wilson (2012) find no association between various measures of corporate governance and tax planning. This chapter studies wider external governance mechanisms in the institutional theory framework set out in Section 2, which systematically studies the strength of internal governance in relation to the external governance mechanisms. This allows me to cover the

diverse corporate governance characteristics and research settings used in the above-mentioned previous research and provide a UK perspective on the previous findings.

A third strand of the literature focuses on the impact of different governance factors on tax planning, including studying the impact of board structure (e.g., Lanis and Richardson 2011; Lanis et al. 2017), the role of external auditors (e.g., Klassen et al. 2016) and ownership structure (e.g., Badertscher et al. 2013) on tax planning.

Tax planning research throughout these phases has been dominated by the agency theory framework, and a need for consideration towards wider institutional factors is highlighted to expand this research (Hanlon and Heitzman 2010; Kovermann and Velte 2019). Motivated by these calls and the relevance of the institutional framework to the current phase of tax planning research, I develop my hypotheses as in the following section.

4.3.2 Hypothesis development

4.3.2.1 Tax affiliations

Various characteristics of top-level executives, including their qualifications (Adams et al. 2018), achievements (Malmendier and Tate 2009) and family matters (Bennedsen et al. 2020), have been studied to find relevance for firms' decision-making and performance. Similarly, various characteristics of the board of directors have been studied extensively to find their relevance to firms' performance (e.g., Larcker et al. 2013; Fedaseyeu et al. 2018). Some research addresses the relevance of the board of directors' characteristics to tax planning, since Dyreng et al. (2010) find that

individual characteristics of top management are associated with tax planning. Further research on the association between directors' characteristics and tax planning is expanding by including directors' tax expertise and their demographics (Kovermann and Velte 2019).

Tax planning is a strategic-level decision (Armstrong et al. 2019) that requires top executives' involvement, and the monitoring role of the board of directors requires reviewing the tax planning strategy of the firm. Board members with tax affiliations should be able to contribute positively to the monitoring role and setting-up of a desired tax planning strategy, as they hold the skills and responsibility on the matter. Executive directors set "the tone at the top" in terms of tax planning (Desai and Dharmapala 2006; Dyreng et al. 2010) and tax directors shape the tax planning strategies of the firm, which inform the rest of the structure to achieve any targets set (Armstrong et al. 2015).

The Chartered Institute of Taxation (COIT), the leading body for tax professionals in the UK, defines tax planning in line with HMRC's definition, confirming its adherence to the legal position on tax planning (CIOT 2017). Firms with tax affiliated directors on the board will adopt tax planning strategies in line with the tax law and these affiliations act as regulatory forces identified by institutional theory (Scott 2013). However, any other professional accountancy institutions (e.g., ACCA) have taxation services as an optional area of specialism for their students. Previous research studies the impact of the board's accounting qualifications, MBA qualifications and financial experience on tax planning (Dyreng et al. 2010; Law and Mills 2017). However, Taylor and Richardson (2014) study directors' affiliations with Australian tax institutions and find

a significant negative association between tax affiliations of the board of directors and tax planning in Australian listed firms.

Directors with professional tax affiliations have a dual role as ambassadors of the professional institute and perform their board tasks for the firms, and their reputation is potentially at risk if any tax investigations are initiated against the firm. They are the prominent connections for normative forces to achieve the normative isomorphism in line with the professional code of the institution. These directors are expected to be up-to-date with the current tax issues and also to be involved in the relevant policy matters. Moreover, through various Continuing Professional Development (CPD) courses, these directors are connected to the other affiliates of the institute as well as the wider professional body. These connections are channels for mimetic forces that influence the institutional beliefs and common understanding of the dominant or majority view (Scott 2013), including tax planning matters.

In the absence of any previous evidence for the association of tax affiliated directors on the board and tax planning, I set my first hypothesis as below:

H1: *Tax planning in UK firms is associated with tax affiliations of the board of directors.*

4.3.2.2 Tax experience

Boards of directors' external connections are positively associated with firms' profits (Larcker et al. 2013) and tax planning. This is due to the directors' wider access to information and operating practices (Brown and Drake 2014). Devising or contributing

to a firm's tax planning strategy requires specific taxation expertise or information to contract such expertise that directors may have accumulated with their previous work experience; hence, any previous work connections could support their current tax planning decision-making needs. Fedaseyeu et al. (2018) conduct a comprehensive study of various categories of previous experiences of directors and find that experienced directors are more effective in their roles on the board. Experienced directors understand their responsibility clearly and connect effectively with other board members, influencing the monitoring and decision-making process (Westphal and Milton 2000).

In the institutional theory context, individual connections result in diffusion of norms and values at institutional level in terms of tax planning activities and overall attitude towards tax planning. Law and Mills (2017) study the impact of directors' military experience on tax planning and conclude that the overall culture of legitimacy in the military results in the directors following the legal stance on tax planning and engaging less in tax planning than their counterparts. Directors' previous engagements in financial decision-making roles (e.g., CEO, CFO, Tax Director) should have exposed these directors to the overall attitude or dominant values towards tax planning of their previous employers. Hence, in addition to the tax skills and knowledge, these directors may hold a pre-determined attitude towards tax planning.

Tax experienced directors are expected to contribute positively to tax planning, benefitting from the skills and knowledge accumulated with work experience (Taylor and Richardson 2014). Unlike tax affiliations and associated professional conduct, tax experience can be utilised by directors without the requirement for adherence to any

professional code of conduct to achieve their firm's tax objectives. In line with the above discussion, I set my second hypothesis as below:

H2: *Tax planning in UK firms is positively associated with tax experience of the board of directors.*

4.3.2.3 Professional accountancy qualifications on the board of directors

The education level of directors suggests the time they have spent in an academic setting. Exposure to similar education disciplines and levels can promote a homogeneous approach to decision-making by the board members. Moreover, the directors with more qualifications are expected to have attended more educational institutions and would have possibly made more connections. Qualified directors understand their responsibility clearly and they effectively connect with other board members, influencing the monitoring and decision-making process (Westphal and Milton 2000).

Fedaseyeu et al. (2018) study different levels of university education among directors (i.e. undergraduate, graduate, MBA) and find a positive association between those directors' qualifications and their ability to engage in various activities of the board. They argue that the board functions are executed by relevant committees, and that directors with more qualifications are able to be part of more committees and hence influence firms' decisions. Adams et al. (2018) find that directors' academic background (PhD level) contributes to firms' performance only when there is commonality between the skill sets of the directors on the board.

Contrasting evidence comes from Dyreng et al. (2010) and Law and Mills (2017), who do not find a significant association between financial sophistication (MBA education) and tax planning.

Professional accountancy qualifications (e.g., ACA and ACCA) cover a wide range of subjects, including taxation, auditing and finance. The professional code of conduct and ethics is part of these qualifications, making them more relevant for tax planning related research than general accounting or business qualifications. These qualifications are channels of normative and mimetic forces proposed by institutional theory, as the professional institutions define and promote the right behaviour of their graduates (Scott 2013). Fedaseyeu et al. (2018) use professional credentials to study directors' expertise in association with the board functions. However, boards' professional accountancy qualifications have not been studied in relation to firms' tax planning activities.

Based on the above discussion, I set my third hypothesis as below:

H3: Tax planning in the UK firms is positively associated with professional accountancy qualifications of the board of directors.

4.3.2.4 Auditor-Provided Tax Services (APTS)

Statutory external audit is an important external governance mechanism (Baber et al. 2012) and there are conflicting findings in the literature on the impact of non-audit services (NAS) on auditors' independence and audit quality (Paterson and Valencia 2011; Campa and Donnelly 2016). Firms may use their internal tax planning

department, an external non-auditor consultant or their statutory auditor for tax planning. Using either of the first two options will require the statutory auditors to review the tax planning strategies in place as part of their statutory audit, while for the third option this scrutiny is through self-review, saving time and efforts.

Auditors are regulated by FRC in conducting their statutory audit work and mostly are also members of a professional institute that has its professional code of conduct and is also regulated by FRC (FRC 2020). As an external governance mechanism, auditors interact with other governance mechanisms in a firm, as suggested by Weir et al. (2002), and channel regulatory, normative and mimetic forces in line with institutional theory (Scott 2013) that they carry due to their statutory appointment and professional affiliations. The APTS provide evidence for formal engagement of these external institutional forces with firms' tax planning activities.

A wide range of literature finds a positive association between APTS and tax planning (Cook et al. 2008; Armstrong et al. 2012; Hogan and Noga 2015) due to the 'knowledge spill-over' involved in the auditors' dual role, which leads to the adoption of effective tax planning strategies. These findings are based on research conducted in the US context, where the corporation tax rates have been among the highest in the world for the period covered by this research (OECD 2019). Hence, it is expected that the auditors or any other specialists used for tax planning activities will save tax bills for their clients. McGuire et al. (2012) find a stronger positive association between APTS from auditors with tax expertise and tax planning.

Auditors face high litigation risk in addition to any reputational risk if their independence is questionable. Klassen et al. (2016), using US data, find that Big 4

auditors are less involved in tax planning when they engage in APTS. Richardson et al. (2013), using Australian data, find a negative association between APTS by the Big 4 and tax planning in an effective internal control environment. So, auditors engaging in APTS may protect their reputation by operating in strongly governed settings or by engaging less in tax planning activities. Finally, Garcia-Blandon et al. (2020), using Spanish data, find a negative association between APTS and tax planning. The time period covered by these three studies faced a comparatively higher corporation tax rates in the relevant countries compared to the other countries in their regions, with the exception of Spain, where the tax rate dropped for the last couple of years of Garcia-Blandon et al.'s (2020) study, but this decline in tax is not explored by the researchers. The lower tax rates in countries like the UK may reduce the expectation and pressure on those engaged in formulating the tax planning strategies.

To the best of my knowledge, there is no UK-based study exploring any relationship between APTS and tax planning. The current US-based findings of positive associations may not be applicable for any other audit and tax regulatory settings. Moreover, recent media attention and negative publicity about firms' engagements in tax planning (*Google's tax deal scrutinised* 2016; Kinder and Agyemang 2020) also raises questions about the statutory auditors' role. To protect and improve their reputation and image, statutory auditors engaging in APTS may avoid aggressive tax planning for their clients using coercive and normative forces due to their dual role.

Based on the mixed findings in the literature and the above discussion, I set my fourth hypothesis as follows:

H4: *Tax planning of the UK firms is associated with tax services provided by their statutory auditors*

4.3.2.5 Institutional ownership

Ownership structure for listed firms can have different variations based on the nature and extent of bloc ownership of shares. The existing literature views various bloc ownerships to impact the agency relationship and influence the tax planning engagements of the management (Khan et al. 2017). Chen et al. (2010) find a negative association between dominant family shareholders and tax planning in family-owned public firms. In that study, the key management positions are held by these family shareholders, who are hence expected to protect the minority shareholders' interests in the firms acting as their agents, and the minority shareholders may see tax planning as a mechanism for any personal benefits for the family shareholders. Ownership and control concentrated with management of listed firms also leads to risk-averse investment behaviour due to any penalties or deferred losses associated with a tax planning option available in the current period, and hence the concentration of ownership and control with the management is negatively associated with tax planning (Badertscher et al. 2013). Similarly, Chan et al. (2013) find government-controlled listed firms to be less tax aggressive compared with non-government-controlled firms. McGuire et al. (2014) find a negative association between insider ownership and tax planning in the case of dual share classes in listed firms where a class of shares holds higher or equal voting rights to the other class of shares but lower rights to the after-tax profits (i.e. the dividends). The separation between the shareholders' decision-making power and their lack of claim to the benefits arising from tax planning – that is,

higher voting rights but lesser claim to dividends – leads to the negative association with tax planning.

Tax planning strategies are like risky investments with reductions in tax payments achieved at the cost of tax planning arrangements and the risk of being challenged by the tax authorities: hence, management attitude towards risk will influence engagement in such strategies (Armstrong et al. 2015). Institutional shareholders are expected to influence the board-level tax planning decision-making based on their own attitude to risk. Moreover, their institutional norms and values are also expected to influence their contribution, as proposed by institutional theory (Scott 2013). Institutional owners include government investments and pension funds that are expected to control any tax planning activities to avoid any associated risks in the long-run. The governance roles associated with long-term institutional ownership are observed by Dong and Ozkan (2008) in the UK context.

On the other hand, institutional owners are expected to help to control the agency problems and ensure maximisation of shareholders' wealth, which requires engagement in tax planning activities. Chen et al. (2019) find a positive association between institutional ownership and tax planning for Russell Index firms, supporting the previous conclusions of Bird and Karolyi (2017) and Khan et al. (2017).

Although the existing literature on institutional ownership is grounded in an agency theory framework, the recent increase in public awareness (Kinder and Agyemang 2020) and regulatory attention (OECD 2020) towards corporation tax matters has resulted in various forms of internal and external control on the agency problems (e.g., IAS12 and FIN 48). However, institutional ownership is a relevant

channel of dissemination of institutional values across firms. Absence of institutional shareholders in a firm means the exclusion of a channel of external institutional forces that may influence the tax planning strategies of the firm. Hence, external institutional ownership plays the key role, as compared to the management concentration of ownership, family ownership or dual class ownership.

Based on the above dominant findings in the literature and expectations built on institutional theory, I set my fifth hypothesis as below

H5: *Tax planning activities of the UK firms are negatively associated with external institutional control*

4.4. Methodology

4.4.1 Sample selection

The initial sample consists of UK domiciled non-financial firms that remain continuously listed on the London Stock Exchange between 2010 and 2015. Any firms delisted during the sample period are excluded from the sample for all years. This sampling strategy introduces survivorship bias but at the same time it provides a balanced set of panel data of firms with consistent motivation to engage in tax planning. Moreover, delisted firms actively trading are also not included in the sample as they are not obliged anymore to disclose tax planning information under IAS 12. Firms that were not active partially during the sample period were excluded from the sample to have a balanced representation of firms' in each sample year. This is important to capture impact of decreasing tax rates on firms' tax planning strategies

which might be biased by the inclusion of these firms' tax planning activities partially during the sample period.

The sample is restricted to UK domiciled firms only because these firms are equally subject to the UK tax regulations. Financial firms are excluded because they are subject to different reporting regulations from non-financial firms. The sample period starts from 2010, since that year marks the start of a reduction in the UK corporation tax rates.³¹ Mills et al. (1998) and Abdul Wahab and Holland (2012) argue that consistently profit-making firms are expected to have stronger incentives towards tax planning and thus only consider those firms. However, a rational decision-maker would not let any tax saving opportunity go, even when reporting a loss for a particular accounting period. In fact, any loss before tax expense shown in the income statement is subject to adjustments to get taxable profits or losses, which are then taxed using appropriate corporation tax rates or allowed for to get appropriate tax reliefs, respectively. These adjustments may well convert accounting loss to taxable profit and vice versa.

Panel A of Table 4.1 presents the sample selection, and Panel B of Table 4.1 shows the sample allocation over different industries as per Industry Classification Benchmark (ICB). A total of 338 non-financial firms remain listed on the LSE for the entire sample period, and after excluding any firms with missing financial statements for one or more years, the sample total is 261. In line with the literature (e.g., Desai

³¹ The UK corporation tax rates started to decrease from 2010 after staying fixed at 30% for a decade (OECD 2019).

and Dharmapala 2006), firm years with extreme ETR and Cash ETR (i.e. < -1 and > 1) are excluded from the sample. These extreme values show tax planning of more than the profit before tax, which is only possible in exceptional situations, and, if not excluded, will influence results. The final sample has 1384 firm years as usable observations.

4.4.2 Measurement of variables

4.4.2.1 Main dependent variables: Tax planning

The literature has used various tax planning measures.³² In line with the prior literature, the current study uses an output-based definition of tax planning rather than an input-based definition, so in my main analysis I focus on the reported outcome of tax planning and not on the strategies adopted to achieve this outcome. These measures use the limited tax disclosures on tax planning, as further detailed information is not publicly available due to the confidential nature of the tax returns filed to the tax authorities. One of the main measures of tax planning is the Effective Tax Rate (ETR), measured as a ratio of tax expense reported to Profit Before Tax (PBT). This measure is based on the tax expense amount reported by a firm and includes any reporting adjustment in line with the relevant accounting regulations. On the other hand, Cash ETR is used by replacing tax expense with tax payments in the period.

³² For reviews, see Hanlon and Heitzman 2010; Wilde and Wilson 2018.

Table 4.1 Sample selection

Panel A presents the number of firms that remained listed throughout the period and whose financial data is accessible. It further presents the total number of firm years available after excluding any years with extreme Effective Tax Rate (ETR >1 or ETR <-1) and Cash Effective Tax Rate (CETR >1 or CETR <-1). Panel B provides the spread of the sample across different industries. Panel C columns 2 and 3 show the main tax rate and small business tax rates respectively that were applicable over the sample period shown in column 1. Columns 4, 5 and 6 show total tax planning, disclosed tax planning and undisclosed tax planning for the sample period, respectively. Total tax planning, disclosed tax planning and undisclosed tax planning for the sample period are presented in columns 4, 5 and 6, respectively.

Panel A	
Description	Number of firms
All listed non-financial firms	338
Exclude:	
Firms unavailable in Bloomberg	(37)
Firms without complete financial statements	(40)
Final sample size (number of firms) in each year	261
Complete firm-year observations (261*6)	1566
Exclude:	
Outliers	(182)
Final firm-year observations	1384

Panel B		
ICB Industry	Firm years	Percent
Basic Materials	83	6.00
Consumer Goods	198	14.31
Consumer Services	315	22.76
Health Care	76	5.49
Industrials	512	36.99
Oil & Gas	60	4.34
Technology	69	4.99
Telecommunications	29	2.1
Utilities	42	3.03
Total	1384	100

Panel C					
Financial Year (1)	Main tax rate (2)	Small business rate (3)	Total TP mean(median) (4)	Disclosed TP mean(median) (5)	Undisclosed TP mean(median) (6)
2010	28%	21%	3.407 (5.779)	2.225 (0.791)	1.323 (2.770)
2011	26%	20%	3.511 (5.827)	5.375 (2.386)	-1.925 (2.507)
2012	24%	20%	0.938 (2.657)	2.428 (1.015)	-1.287 (0.718)
2013	23%	20%	-2.018 (1.167)	-0.092 (0.090)	-1.778 (0.000)
2014	21%	20%	-5.240 (0.369)	-0.435 (0.247)	-4.456 (-0.456)
2015	20%	20%	-6.425 (-1.201)	-2.689 (-0.890)	-3.554 (0.326)
		Total	-0.959 (2.064)	1.148 (0.395)	-1.961 (0.752)

I use a wider definition of tax planning by computing the difference between the Statutory Tax Rate (STR) and Cash ETR, which consists of disclosed tax planning and undisclosed tax planning, as shown in the equations below:

$$\text{Statutory Tax Rate (STR)} - \text{Effective Tax Rate (ETR)} = \text{TP_DISC [disclosed tax planning]} \quad (1)$$

$$\text{Effective Tax Rate (ETR)} - \text{Cash ETR} = \text{TP_UNDISC [undisclosed tax planning]} \quad (2)$$

$$\text{STR} - \text{Cash ETR} = \text{TP_TOTAL} \quad [(1) + (2)] \quad \text{[total tax planning]} \quad (3)$$

The three tax rates used in the above equations (i.e. STR, ETR and Cash ETR) are all computed as a function of Profit Before Tax (PBT). My measure of tax planning is consistent with Dyreng et al. (2008); however, unlike those authors, I use annual values to calculate tax planning to observe the annual changes in tax rates in the UK.

Table 4.1, Panel C columns 2 and 3 present the corporation tax rates in the UK over the sample period and both columns demonstrate a reduction in tax rates. Dyreng et al. (2008) argue that Cash ETR has a mismatch of numerator and denominator, as the payments for taxes are usually delayed by a year. This issue can be addressed by separating the sample firms into large and non-large firms, as follows: 1) large firms that are required to start paying their tax liabilities in advance in instalments, and hence their tax payments may not need lagging; and 2) firms that pay their tax liabilities nine

months and one day after the end of their accounting period.³³ As the sample for the current study mainly consists of large businesses, there is no need to lag the tax payments by a year when calculating Cash ETR. Disclosed tax planning and undisclosed tax planning are a split of total tax planning as a difference between STR and ETR and between ETR and Cash ETR, respectively. These computations are presented in the literature review section as equations (1) and (2), respectively.

4.4.2.2 The main independent variables

These are tax affiliations on the board, tax experience of the board, professional accountancy qualifications on the board, Auditor-Provided Tax Services (APTS) and Institutional ownership.

Tax affiliation is measured as a dummy variable recording 1 if at least one member of a firm's board of directors has a professional affiliation with the tax-related professional body, namely the Chartered Institute of Taxation (CIOT). Tax experience is measured as the total number of previous relevant appointments held by the directors on the board. Employment records of the directors are searched for the key words namely "tax", "CFO", and "CEO" and the total previous appointments on the board are scaled by board size. Professional accountancy qualifications are measured as the total number of relevant qualifications computed from the education records of

³³ The threshold for large firms in the UK is augmented profits of £1.5 million. The augmented profits are computed as total tax adjusted profits plus any dividends received by the company. The threshold is reduced for a group, which is done by dividing the threshold by the total number of firms in the group, including the parent company (Large Companies 2007).

each director and scaled by the board size. These measures of tax expertise are in line with Taylor and Richardson (2014) and Law and Mills (2017)

In line with the current literature, APTS are measured as fees paid to auditors for tax related services as a proportion of total fees (Hogan and Noga 2015). I am not interested in measuring all non-audit fees that measure auditors' independence but my measure is specific to the auditor's engagement on tax planning activities: hence, other audit fees are not included in my measure. Institutional ownership is measured as significant share ownership (5% or more) held by external institutions.

In my sample, this significant ownership in firms is held by government, investment companies, pension funds and the management. My measure does not include any significant proportion of ownership held by the management: this is to retain my focus on external institutions impacting tax planning activities of a firm, which is in line with Lanis and Richardson (2011).

4.4.2.3 Control variables: corporate governance and firm characteristics

In line with the previous literature, I control for corporate governance attributes of board size, non-executive directors on the board and CEO duality (e.g., Abdul Wahab and Holland 2012; Taylor and Richardson 2014; Dyreng et al. 2016; Garcia-Blandon et al. 2020). I use the natural log (Ln) of board size, the proportion of non-executive directors to board size and CEO duality as a dichotomous variable (Desai and Dharmapala 2006; Abdul Wahab and Holland 2012; Armstrong et al. 2015). I further control for firm characteristics: firm size, measured as the log of total assets; profitability as PBT as the proportion of total assets; leverage as the proportion of total

debt to total assets; R&D intensity as the proportion of R&D expenditure to total assets; capital intensity as the proportion of property, plant and equipment value to total assets; and inventory intensity as the proportion of inventory value to total assets (Gupta and Newberry 1997; Armstrong et al. 2012; Richardson et al. 2013). A literature review of these firm characteristics is provided is discussed in Section 3.4.2.3 of Chapter 3.

4.4.3 Empirical models

Three regression equations are used to study the relationship between the three measures of tax planning (total tax planning, disclosed tax planning and undisclosed tax planning), and the five key variables of tax affiliations, work experience, education, auditors' control and external institutional control. These regression equations estimate each tax planning measure based on Ordinary Least Squares (OLS) with year- and industry-fixed effects, as follows:

$$\begin{aligned}
 TP_TOTAL_{it} = & \beta_0 + \beta_1 TAX_AF_{it} + \beta_2 W_EXP_{it} + \beta_3 EDU_{it} + \beta_4 AUD_C_{it} + \beta_5 EXT_C_{it} \\
 & + \beta_6 B_SIZE_{it} + \beta_7 NED_{it} + \beta_8 CEO_D_{it} + \beta_9 TA_{it} + \beta_{10} PBT_{it} + \beta_{11} LEV_{it} \\
 & + \beta_{12} R\&D_{it} + \beta_{13} CAP_INT_{it} + \beta_{14} INV_INT_{it} + \sum_{n=1}^9 \beta_n IND_DUM_{it} \\
 & + \sum_{n=1}^6 \beta_n YEAR_DUM_i + \varepsilon_{it}
 \end{aligned}$$

Equation 1

$$\begin{aligned}
TP_DISC_{it} = & \beta_0 + \beta_1 TAX_AF_{it} + \beta_2 W_EXP_{it} + \beta_3 EDU_{it} + \beta_4 AUD_C_{it} + \beta_5 EXT_C_{it} \\
& + \beta_6 B_SIZE_{it} + \beta_7 NED_{it} + \beta_8 CEO_D_{it} + \beta_9 TA_{it} + \beta_{10} PBT_{it} + \beta_{11} LEV_{it} \\
& + \beta_{12} R\&D_{it} + \beta_{13} CAP_INT_{it} + \beta_{14} INV_INT_{it} + \sum_{n=1}^9 \beta_n IND_DUM_{it} \\
& + \sum_{n=1}^6 \beta_n YEAR_DUM_i + \varepsilon_{it}
\end{aligned}$$

Equation 2

$$\begin{aligned}
TP_UNDISC_{it} = & \beta_0 + \beta_1 TAX_AF_{it} + \beta_2 W_EXP_{it} + \beta_3 EDU_{it} + \beta_4 AUD_C_{it} + \beta_5 EXT_C_{it} \\
& + \beta_6 B_SIZE_{it} + \beta_7 NED_{it} + \beta_8 CEO_D_{it} + \beta_9 TA_{it} + \beta_{10} PBT_{it} + \beta_{11} LEV_{it} \\
& + \beta_{12} R\&D_{it} + \beta_{13} CAP_INT_{it} + \beta_{14} INV_INT_{it} + \sum_{n=1}^9 \beta_n IND_DUM_{it} \\
& + \sum_{n=1}^6 \beta_n YEAR_DUM_i + \varepsilon_{it}
\end{aligned}$$

Equation 3

where TP_TOTAL is the total tax planning, measured as the difference between STR and Cash ETR. TP_DISC is the disclosed tax planning, measured as the difference between STR and ETR. TP_UNDISC is the undisclosed tax planning, measured as the difference between ETR and Cash ETR. TAX_AF is tax affiliations, measured as the number of tax organisations where board members hold external positions. W_EXP is work experience, measured as the number of organisations worked at previously. EDU is the combined education of the board, measured as the total number of qualifications of all board members. AUD_C is auditor control on tax planning, measured as the proportion of tax consultancy fees paid to the auditors. EXT_C is the external control, measured as the total significant ownership (5%) of shares by government institutions, pension funds and investment companies. Control variables: B_SIZE is the natural log (Ln) of total number of the board members; NED is the non-executive directors, measured as the proportion of the board size. CEO_D is the chief executive officer's dual role as the board chairman, measured as a binary

variable. TA is total assets, measure as Ln of total assets; PBT is measured as profit before tax; LEV is leverage, measured as total debt to equity ratio; R&D is measured as the ratio of R&D expenditure to total assets; CAP_INT is measured as a ratio of property plant and equipment value to total assets; INV_INT is measured as a ratio of inventory value to total assets; IND_DUM are industry dummies and YEAR_DUM are year dummies. All continuous variables are winsorized at the 1st and 99th percentiles to mitigate the effect of outliers.

4.5. Empirical results

4.5.1 Descriptive statistics

Descriptive statistics are presented in Table 4.2. The principal dependent variables of total tax planning, disclosed tax planning and undisclosed tax planning, presented in Panel A, have means (median) of -0.959% (2.064%), 1.148% (0.395%) and -1.961 (0.752%), respectively. This indicates that on average, firms have paid 0.959% of their PBT in excess of the STR applicable on them, which is linked to 1.961% of payments in excess of their reported tax expenses (i.e. ETR). The disclosed tax planning of 1.148% indicates disclosure of tax expenses in the Income Statement lower than the STR by 1.148% of PBT. This initial observation is against the overall public opinion about multinational firms paying less in taxes, which is built upon some cases highlighted in the press (e.g., Kinder and Agyemang 2020).

A further annual analysis of this overall tax planning observation is possible by looking back at Table 4.1, column C, which shows reducing mean (median) total tax planning of 4.407% (5.779%) in 2010 to -6.425% (-1.201) in 2015, disclosed tax

planning of 2.225% (0.791%) in 2010 to -2.689% (-0.890), and undisclosed tax planning of 1.323% (2.770%) in 2010 to -3.554 (0.326%) in 2015 in columns 4, 5 and 6, respectively. This reduction is in line with the main tax rate reduction over the period from 28% in 2010 to 20% in 2015, as presented in column 2. In line with Guenther et al. (2017), this observation indicates that firms have targeted tax expenses to report and pay in proportion to their profits and performance.

The descriptive statistics in Table 4.2, Panel A, indicate skewed distributions for the dependent variables, which is due to some observations with above normal tax planning on the negative side of distribution (i.e. tax payments in excess of STR). One possible reason for this is that my sample includes loss-reporting firms reporting negative ETR, but they may pay tax due to non-adjustable accrual expenses for tax purposes.

Moreover, even if there are no accrued expenses, a negative ETR in the Income Statement does not mean a tax repayment from HMRC, as firms need to set these losses against their future taxable profits to claim tax relief (Work out and Claim Relief from Corporation Tax Trading Losses 2013). Nine percent of my observations have negative PBT and 30% of my sample are firms with at least one loss-reporting period over the sample period (2010-2015). I have not excluded any firms or observations due to their loss-reporting status, as rationally firms do not stop planning when they report losses, especially when these losses are “good” for them for tax planning purposes as future tax relief.

In Table 4.2 Panel A, tax experience and professional qualifications on the board have mean (median; SD) values of 0.137 (0.125; 0.170) and 0.297 (0.286; 0.180),

respectively. These indicate that on average directors with tax experience (professional qualifications) hold a minority (majority) representation on the boards as compared with professional qualifications. Furthermore, the board of directors' composition (not tabulated) in my sample consists of 59.43% of firms with at least one board members with previous tax experience and 94.06% of firms with at least one director with a professional accountancy qualification present on the board. Panel B shows that 4.39% of firms have at least one director on the board with at least one tax affiliation.

Table 4.2 Summary statistics: all firms

This table provides summary statistics of all variables presented in Panel A under three headings: principal dependent variables, principal independent variables and control variables. The three principal dependent variables presented as percentage of Profit Before Tax (PBT) are: total tax planning, calculated as the difference between Statutory Tax Rate (STR) and Effective Tax Rate (ETR); disclosed tax planning, calculated as the difference between STR and Cash ETR; and undisclosed tax planning, calculated as the difference between STR and Cash ETR. The principal independent variables include the following four variables: *tax experience*, calculated as the total number of previous employment roles of all directors on the board in tax-related positions, presented as a proportion of the board size; *professional accountancy qualifications*, which are the total number of professional accountancy qualifications given in all directors' education history, presented as a proportion of the board size; *Auditor-Provided Tax Services (APTS)*, which are fees paid to the statutory auditors for tax-related services, presented as a percentage of total audit fees; and *institutional ownership*, which is all bloc share ownership (excluding management's) greater than or equal to 5% of the total issued shares, presented as a percentage of the total shares issued. The control variables are: board size, which is the natural log of total number of board members; non-executive directors, which is the proportion of non-executive board members; independent directors, which is the proportion of independent directors on the board; total assets, presented as the natural log of total assets; profit before tax, presented as the proportion of total assets; R&D intensity, which is measured as total R&D expenditure and is presented as a percentage of total assets; capital intensity, which is measured as the property plant and equipment value disclosed in the balance sheet and is presented as a percentage of total assets; and inventory intensity, which is measured as the value of inventory reported in the balance sheet and is presented as a percentage of total assets.

Panel B presents both dichotomous variables: *tax affiliates* that is the fifth principal independent variable measured as 1 (presented in column 2) when at least one board member has at least one affiliation with the tax institute (Chartered Institute of Taxation), otherwise 0 (presented in column 3); and CEO duality as a control variable, which is measured as 1 (presented in column 2) if the CEO and Chair of the board of directors is the same person, otherwise 0 (presented in column 3). The total number of observations is presented in column 1.

Panel A	(1) N	(2) Mean	(3) SD	(4) p25	(5) Median	(6) p75
Principal dependent variables						
Total Tax Planning	1384	-0.959	20.47	-6.681	2.064	9.914
Disclosed Tax Planning	1384	1.148	17.646	-3.978	0.395	6.104
Undisclosed TP	1384	-1.961	20.315	-6.811	0.752	7.247
Principle independent variables						
Tax Experience	1363	0.137	0.170	0.000	0.125	0.200
Professional Accountancy Qualifications	1363	.297	.18	.167	.286	.4
Auditors Provided Tax Services (APTS)	1233	0.412	0.238	0.231	0.386	0.555
Institutional Ownership	1366	9.333	8.646	0.000	7.000	15.000
Control variables						

Board Size	1363	2.059	0.270	1.946	2.079	2.197
Non-Executive Directors	1357	0.643	0.124	0.571	0.667	0.714
Independent Directors	1087	0.535	0.197	0.394	0.536	0.681
Size	1384	6.715	1.789	5.510	6.592	7.883
Profitability	1384	8.069	10.114	4.268	7.523	12.262
R&D Intensity	1320	1.843	6.099	0.000	0.000	1.317
Capital Intensity	1381	74.503	20.016	60.444	76.914	91.910
Inventory Intensity	1376	11.762	14.959	1.310	7.766	16.276

	(1)	(2)	(3)
Panel B	N	Yes	No
Tax Affiliations (%)	1138	4.39	95.61
CEO Duality (%)	1357	13.97	86.07

APTS have lower observations (1233) as compared with the other principal variables due to lack of data availability on tax consultancy fees paid to the statutory auditors. The mean (median; SD) value is 0.412 (0.386; 0.238), presented as the total fees paid to the statutory auditors. Institutional ownership has mean (median; SD) of 9.333 (7; 8.646), and 28.04% of firms in my sample have 0% external institutional control (not tabulated).

Finally, mean (median; SD) values for my control variables are: board size 2.059 (2.079; 0.270), non-executive directors 0.643 (0.667; 0.124), total assets 6.715 (6.592; 1.789), PBT 8.069 (7.523; 10.114), R&D intensity 1.843 (0; 6.099), capital intensity 74.503 (76.914; 20.016) and inventory intensity 11.762 (7.766; 14.959). These summary statistics are as expected for these control variables.

4.5.2 Mean Comparison: t test

This section compares the means across the strong and weak corporate governance distribution of the entire sample to study the interaction of external institutional factors with the internal governance strength. The governance mechanisms interact with each other (Baber et. al. 2012) and the external governance mechanisms may supplement or complement the internal governance (Weir et al. 2002; Gillan 2006). In line with Elshandidy and Neri (2015), I use the median of independent directors to split the sample into strongly governed firms (above median) and weakly governed firms (below median). The results are presented in Table 4.3, where significance levels of 5% and 1% are shown as ** and ***, respectively.

The key findings presented in Table 4.3 indicate that weakly governed firms engage in significantly higher total tax planning (coefficient -2.708**; t value -2.207) and undisclosed tax planning (coefficient -2.760**; t value -2.292) but they engage in comparatively lower disclosed tax planning, although this is not statistically significant. This observation indicates a negative association of tax planning with governance, which is in line with the findings of Armstrong et al. (2015) and Taylor and Richardson (2014) but does not support Desai and Dharmapala's (2009) view of a positive association.

This observation is preliminary and needs further analyses to find any association between tax planning and my main variables of interest. Yet this indicates the relevance of tax planning to governance quality in the UK context, which is broadly in line with Dyreng et al.'s (2016) findings of a negative relationship between tax planning and external governance.

4.5.3 Correlation

Pairwise correlation is conducted to analyse the correlation between two variables independent of any effect of the other variables. I use Pearson and Spearman correlations to observe both parametric and non-parametric relationships between each pair of variables. This analysis helps to identify the strength and direction of relationships between all pairs of variables. Moreover, it also gives an indication of any potential multicollinearity for the regression analysis. The findings for the pairwise correlations are presented in Table 4.4 above (below) the diagonal for Spearman (Pearson) correlation with significance levels shown as *** for 0.01, ** for 0.05 and * for

0.01 significance levels. Panel A presents results for all firms, Panel B for strongly governed firms and Panel C for weakly governed firms.

The correlation results in Table 4, all panels, show a significant ($p < 1\%$) positive relationship of total tax planning with disclosed tax planning and undisclosed tax planning, which is as expected, because total tax planning is the sum of disclosed and undisclosed tax planning.

Table 4.3 Means comparison – t tests

Panel A compares the means of two sub-samples created by splitting the main sample into highly governed firms and weakly governed firms based on their governance quality, which is measured as the proportion of independent directors to the board size. Firms with above (below) the median value of governance quality are classified as strongly (weakly) governed firms. Panel B shows CEO Duality split for both sub-samples. All variable definitions are the same as in Table 4.2.

Panel A	Strongly governed firms						Weakly governed firms						Mean comparison	
	N	Mean	SD	p25	Med.	p75	N	Mean	SD	p25	Med.	p75	diff	t value
All continuous variables														
Total Tax Planning	531	-2.16	22.38	-7.44	2.193	9.72	556	0.548	17.926	-4.28	2.348	10.242	-2.708**	-2.207
Disclosed Tax planning	531	1.361	18.551	-3.862	0.762	7.692	556	0.985	15.569	-3.346	0.168	4.692	0.376	0.363
Undisclosed Tax Planning	531	-3.186	21.38	-7.452	0.862	7.001	556	-0.427	18.261	-4.584	1.466	7.205	-2.760**	-2.292
Tax Expertise	523	0.095	0.131	0.000	0.000	0.143	545	0.148	0.154	0.000	0.125	0.222	-0.052***	-5.991
Pro. Accountancy Qualifications	523	0.309	0.184	0.167	0.286	0.429	545	0.309	0.159	0.200	0.286	0.400	0.000	0.000
Auditors Provided Tax Services (APTS)	492	0.377	0.218	0.209	0.341	0.500	504	0.404	0.218	0.250	0.400	0.538	-0.027**	-1.970
External Institutional Control	522	8.307	7.926	0.000	6.000	12.00	549	10.175	8.184	5.000	10.000	15.000	-1.869***	-3.792
Board Size	523	2.173	0.231	2.079	2.197	2.303	545	2.048	0.260	1.792	2.079	2.197	0.124***	8.272
Non-Executive Directors	523	0.698	0.009	0.625	0.714	0.750	545	0.632	0.107	0.556	0.667	0.714	0.065***	10.747
Size	531	7.76	1.675	6.696	7.598	8.661	556	6.761	1.310	5.830	6.651	7.652	0.999***	10.976
Profitability	531	7.895	8.662	3.911	7.204	12.165	556	10.117	8.647	5.521	8.877	13.468	-2.222***	-4.230
Leverage	531	21.51	15.454	9.375	20.53	30.772	556	18.455	16.008	4.548	14.86	28.36	3.057***	3.201
R&D Intensity	508	1.63	3.736	0.000	0.005	2.011	527	1.655	4.775	0.000	0.000	0.747	-2.982**	-2.536
Capital Intensity	531	72.30	19.177	57.43	73.21	89.383	556	75.288	19.567	60.74	77.389	92.631	-0.025	-0.093
Inventory Intensity	529	11.07	14.251	1.661	7.805	15.474	552	12.279	16.891	0.869	7.147	16.042	-1.202	-1.261

Panel B	Strongly governed firms			Weakly governed firms		
	N	Yes	No	N	Yes	No
CEO Duality (%)	517	5.80	94.20	545	16.51	83.49
Tax Affiliations (%)	448	5.80	94.20	556	5.12	94.88

Table 4.4 Pairwise correlation matrix

This table presents Spearman (Pearson) correlation results above (below) the diagonal for pairs of all continuous variables, with significance level presented as ***, ** and * for 1%, 5% and 10% significance levels, respectively. All variables are defined as in Table 4.2 previously. Panel A presents results for all firms, Panel B for the strongly governed firms and Panel C for the weakly governed firms.

Panel A – all firms															
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) Total TP		0.443***	0.649***	-0.089***	-0.061**	-0.004	-0.094***	0.012	-0.047*	0.019	0.244***	-0.044	0.036	0.092***	0.071***
(2) Disclosed TP	0.424***		-0.212***	-0.114***	-0.008	-0.003	-0.068**	0.076***	-0.005	0.115***	0.049*	0.044*	0.076***	-0.025	-0.041
(3) Undisclosed TP	0.623***	-0.435***		-0.024	-0.031	-0.008	-0.049*	-0.022	-0.018	-0.025	0.231***	-0.070***	-0.028	0.125***	0.099***
(4) Tax Experience	0.035	0.009	0.028		0.177***	0.026	0.064**	-0.412***	-0.168***	-0.377***	0.0133	-0.173***	0.032	-0.082***	-0.022
(5) Pro. Acc. Qualifications	0.022	0.045*	-0.006	0.273***		0.177**	0.177***	-0.141***	-0.013	0.022	0.011	-0.045	0.001	-0.104***	-0.060**
(6) APTS	-0.027	0.029	-0.055*	0.003	-0.086***		-0.070**	-0.090***	-0.098***	-0.212***	0.051*	-0.081***	-0.010	0.029	-0.006
(7) Institutional Ownership	-0.133***	-0.083***	-0.059**	0.069**	0.078***	-0.035		-0.141***	-0.021	-0.108***	-0.055**	-0.042	0.045	-0.019	-0.024
(8) Board Size	-0.036	-0.002	-0.032	-0.232***	-0.131***	-0.104***	-0.147***		0.210***	0.630***	0.024	0.221***	-0.041	-0.097***	-0.158***
(9) Non-executive Directors	-0.043	-0.005	-0.037	-0.064**	0.025	-0.118***	-0.020	0.251***		0.415***	0.000	0.251***	0.128***	-0.127***	-0.073***
(10) Size	-0.017	0.036	-0.047*	-0.246***	0.010	-0.203***	-0.144***	0.657***	0.440***		-0.184***	0.441***	-0.080***	-0.119***	-0.105***
(11) Profitability	0.336***	0.136***	0.216***	-0.013	0.050*	-0.047*	0.004	0.032	0.006	-0.051*		-0.231***	0.115***	0.057**	0.089***
(12) Leverage	-0.086***	-0.018	-0.077***	-0.176***	-0.025	-0.072**	-0.048*	0.220***	0.226***	-0.025	-0.137***		-0.115***	-0.129***	-0.150***
(13) R&D Intensity	-0.045*	0.020	-0.059**	0.045*	-0.066**	0.022	0.093***	-0.043	-0.008	-0.209***	-0.351***	-0.200***		-0.259***	0.111***
(14) Capital Intensity	0.103***	-0.018	0.119***	-0.144***	-0.109***	0.040	0.001	-0.099***	-0.135***	-0.097***	0.066**	-0.068**	-0.055**		0.192***
(15) Inventory Intensity	0.089***	-0.020	0.100***	0.062**	-0.024	-0.013	-0.003	-0.111***	-0.110***	-0.080***	0.079***	-0.245***	-0.091***	0.274***	
Panel B – Strongly governed firms															
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) Total TP		0.468***	0.637***	-0.025	-0.061	0.007	-0.087**	-0.001	-0.081**	0.062	0.244***	-0.016	0.009	0.102***	0.041
(2) Disclosed TP	0.414***		-0.185***	-0.09**	-0.003	-0.051	-0.095**	0.14***	-0.017	0.211***	0.02	0.064	0.024	-0.059	-0.106***
(3) Undisclosed TP	0.678***	-0.367***		0.059	-0.031	0.069*	-0.045	-0.106***	-0.065*	-0.098**	0.235***	-0.105***	0.014	0.154***	0.094**
(4) Tax Experience	0.027	-0.028	0.058		0.204***	0.011	0.099**	-0.379***	-0.16***	-0.33***	0.027	-0.076*	0.004	-0.138***	0.077**
(5) Pro. Acc. Qualifications	-0.040	0.035	-0.043	0.178***		-0.106***	0.096**	-0.162***	-0.108***	-0.054	-0.051	-0.012	-0.084**	-0.103***	-0.044
(6) APTS	-0.013	-0.012	-0.011	0.028	-0.126***		-0.09**	-0.048	-0.049	-0.12***	0.011	-0.013	-0.011	0.014	-0.034
(7) Institutional Ownership	-0.120***	-0.090**	-0.044	0.095**	0.098**	-0.077*		-0.18***	-0.046	-0.196***	-0.039	-0.102***	0.042	0.006	-0.027
(8) Board Size	-0.082**	0.040	-0.119***	-0.336***	-0.126***	-0.044	-0.195***		0.24***	0.679***	-0.045	0.181***	-0.043	-0.013	-0.126***
(9) Non-executive Directors	-0.073*	-0.060	-0.032	-0.113***	-0.071*	-0.059	-0.051	0.238***		0.305***	0.012	0.217***	0.082**	-0.099**	-0.125***
(10) Size	-0.032	0.120***	-0.133***	-0.283***	-0.047	-0.131***	-0.215***	0.706***	0.317***		-0.221***	0.348***	-0.077*	-0.025	-0.122***
(11) Profitability	0.360***	0.129***	0.253***	0.070*	-0.013	-0.010	0.017	-0.027	-0.003	-0.103***		-0.245***	0.128***	0.058	0.143***
(12) Leverage	-0.081**	0.040	-0.127***	-0.085**	0.013	0.004	-0.098**	0.177***	0.189***	0.301***	-0.172***		-0.031	-0.061	-0.137***
(13) R&D Intensity	-0.016	0.054	-0.046	0.042	-0.036	-0.041	0.168***	-0.096**	0.061	-0.167***	0.005	-0.225***		-0.28***	0.104***
(14) Capital Intensity	0.099**	-0.032	0.130***	-0.119***	-0.132***	0.007	0.018	-0.030	-0.097**	-0.043	0.049	-0.001	-0.137***		0.071*
(15) Inventory Intensity	0.099**	-0.029	0.113***	0.113***	-0.055	-0.013	-0.018	-0.072*	-0.209***	-0.103***	0.123***	-0.254***	-0.099**	0.214***	
Panel C – Weakly governed firms															
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) Total TP		0.439***	0.648***	-0.046	0.003	-0.004	-0.108***	0.022	-0.043	-0.002	0.248***	-0.104***	0.045	0.078**	0.068*
(2) Disclosed TP	0.442***		-0.232***	-0.079**	0.048	0.037	-0.054	0.022	-0.006	0.044	0.07*	0.022	0.109***	0	0.016
(3) Undisclosed TP	0.580***	-0.473***		-0.02	0.001	-0.06	-0.05	0.04	-0.024	0.026	0.238***	-0.077**	-0.083**	0.107***	0.081**
(4) Tax Experience	0.066*	0.048	0.020		0.214***	-0.015	0.037	-0.339***	-0.001	-0.288***	0.099**	-0.195***	0.119***	-0.084**	-0.061
(5) Pro. Acc. Qualifications	0.083**	0.060	0.025	0.377***		0.001	0.076*		0.053	0.06	0.138***	-0.101***	0.044	-0.058	-0.01
(6) APTS	-0.036	0.063	-0.093**	-0.018	-0.026		-0.086**	-0.082**	-0.179***	0.072*	-0.095**		0.013	0.039	0.041
(7) Institutional Ownership	-0.150***	-0.091**	-0.065*	-0.007	0.067*	0.002		-0.101***	0.026	-0.085**	-0.077**	-0.009	0.058	-0.027	-0.016
(8) Board Size	-0.001	-0.034	0.031	-0.310***	-0.151***	-0.105**	-0.102***		-0.025	0.536***	0.04	0.19***	-0.071*	-0.139***	-0.226***
(9) Non-executive Directors	-0.043	0.017	-0.058	0.014	0.075*	-0.104**	0.012	0.075*		0.229***	-0.106***	0.194***	0.099**	-0.075*	-0.07*
(10) Size	-0.012	-0.036	0.021	-0.317***	0.010	-0.181***	-0.132***	0.574***	0.293***		-0.067*	0.487***	-0.297***	-0.079**	-0.149***
(11) Profitability	0.321***	0.140***	0.191***	0.101***	0.003	0.101***	-0.091**	0.037	-0.060	0.077**		-0.254***	0.1**	0.071*	0.013
(12) Leverage	-0.112***	-0.073*	-0.045	-0.190***	-0.103***	-0.082**	-0.016	0.207***	0.185***	0.474***	-0.134***		-0.262***	-0.15***	-0.191***
(13) R&D Intensity	-0.054	0.013	-0.065*	0.084**	-0.079**	0.035	0.062	-0.002	-0.006	-0.267***	-0.490***	-0.201***		-0.234***	0.115***
(14) Capital Intensity	0.097**	-0.009	0.103***	-0.120***	-0.055	0.062	0.002	-0.130***	-0.096**	-0.066*	0.087**	-0.099**	-0.016		0.272***
(15) Inventory Intensity	0.067*	-0.019	0.081**	-0.097**	0.045	-0.013	0.014	-0.184***	-0.096**	-0.057	0.029	-0.252***	-0.092**	0.321***	

In Panel A, using a Spearman correlation test, tax experience of the board is negatively correlated with total tax planning and disclosed tax planning, with coefficients of -0.089^{***} and -0.114^{***} , respectively, and professional accountancy qualifications on the board are negatively correlated with total tax planning, with a coefficient of -0.061^{**} . This negative association with professional affiliations is in line with Taylor and Richardson's (2014) findings; however, the negative association with tax experience is against my expectation. In Panel B (C), for strongly (weakly) governed firms, the negative association of tax experience is only significant for disclosed tax planning, with a coefficient of -0.09^{***} (-0.079), and professional accountancy qualifications are not significantly correlated with any of the tax planning measures.

In Panel A, using Pearson correlation, APTS is significantly negatively correlated with undisclosed tax planning, with a coefficient of -0.055^* , which is in line with Klassen et al. (2016) and Richardson et al. (2013). It is negatively correlated with total tax planning using Pearson correlation and with all three measures of tax planning using a Spearman correlation test, although these correlations are not statistically significant. This negative correlation could be explained by the potential reputational risks for auditors associated with their involvements in aggressive tax planning for their audit clients. In Panel B, for strongly governed firms, APTS is negatively but not significantly correlated with all three measures of tax planning and significantly positively correlated with undisclosed tax planning, with a coefficient of 0.069^* using a Spearman correlation test; this is in line with the previous literature suggesting tax savings due to knowledge spill-over associated with APTS (Cook et al. 2008; Armstrong et al. 2012; Hogan and Noga 2015). In Panel C, for weakly governed firms,

APTS is significantly negatively associated with undisclosed tax planning, with a coefficient of -0.093^{**} using a Pearson correlation test. These findings indicate that auditors are negatively engaged in undisclosed tax planning for their clients with weak governance, possibly due to reputation concerns, as suggested by Richardson et al. (2013) and Klassen et al. (2016). These contrasting findings due to the governance quality of firms indicate interaction between the external governance role of auditors and the internal governance quality, as suggested by Baber et al. (2012).

Finally, in Panel A, institutional ownership is negatively correlated using Pearson (Spearman) correlation with total tax planning, disclosed tax planning and undisclosed tax planning, with coefficients of -0.133^{***} , -0.083^{***} and -0.059^{**} (-0.094^{***} , -0.068^{**} and -0.049^{*}), respectively. These findings are overall consistent in Panel B and C for strongly and weakly governed firms, respectively. These findings are in line with the wide range of findings associating the negative relationship with ownership concentration (Badertscher et al. 2013), long-term ownership concentration (Khurana and Moser 2013), and government ownership (Bradshaw et al. 2019).

4.5.4 Regression analysis

Table 4.5 reports regression results for my first set of regression models to estimate the tax planning association with my five main variables: tax affiliations, tax experience, professional accountancy qualifications, APTS, and institutional ownership. The tax planning variable and firm characteristic are scaled by PBT and total assets, respectively. Directors' characteristics and corporate governance control variables are scaled by board size, respectively. The OLS regression is conducted with the robust option and standardised beta values are reported in Table 4.5.

Firms having tax affiliated directors on the board engage more in total tax planning (with coefficient of 0.074** and t value of 2.447) and disclosed tax planning (with coefficient of 0.099** and t value of 2.297). These positive associations can be explained by the tax-specific knowledge and skills these board members bring to the board, which are supplemented by the tax connections from the relevant tax institutions with which they are connected. These findings are in line with Law and Mills (2017) but contradict Taylor and Richardson (2014), who claim that tax directors control any aggressive tax planning activities of the firm.

These findings suggest that firms with tax affiliations on the board pay less in taxes in total as compared to the STR. However, their tax expenses reported in the income statement are lower than the STR, but the actual tax payments to the tax authorities are in excess of these expenses reported in the income statement. Hence, improved performance is reported in the income statement due to lower tax expenses, and better relations with the tax authorities are achieved due to tax payments in excess of the expenses reported in the income statement. To test my findings further, I replace the tax affiliation with the professional accountancy affiliations (e.g., ACA, ACCA) and with any other affiliations (e.g., the Institute of Directors). My findings are significantly positively related only with tax affiliations: hence, I do not reject hypothesis 1, that tax affiliations are associated with tax planning. All of the tax affiliations in my sample are with UK tax institutions, confirming the consistency of UK tax-related knowledge of these directors.

In the same table, firms with tax experienced directors on the board show a significantly positive association with total tax planning (with coefficient of 0.088** and t value of 2.124) and a positive but not statistically significant association with

disclosed tax planning and undisclosed tax planning. These firms report lower tax expenses compared with the STR and further pay lower taxes compared with their reported tax expenses.

These findings are intuitive and in line with the previous literature (Larcker et al. 2013; Taylor and Richardson 2014; Fedaseyeu et al. 2018). To test my findings further, the total work experience of the board members in any previous role is used in the regression model (e.g., experience as an engineer). There is no significant association between the total work experience and any measure of tax planning. Hence, I do not reject hypothesis 1: that directors' tax experience is positively associated with tax planning.

Directors' professional qualifications are negatively associated with total, disclosed and undisclosed tax planning, although this association is not statistically significant. This negative association contradicts the previous findings of Law and Mills (2017) and Fedaseyeu et al. (2018). I further use the overall education level of the board to test my findings and the results are not significant. Possible explanations for this could be the lack of involvement of professional accountants in tax-related decision-making or lack of specialism in tax-related matters.

Directors on the board affiliated with a tax professional institution and with previous tax-related work experience are in a better position to play the tax-specific governance role on the board. This finding is further strengthened by the non-relevance of any professional qualifications on the board, any non-tax work experience and overall education level of the board. These results support the previous claim of Desai and Dharmapala (2009) that strong governance mechanisms favour tax

planning. Based on my findings, I reject hypothesis 3: that professional accountancy qualifications are positively associated with tax planning.

Table 4.5 shows that APTS are significantly negatively associated with total tax planning and undisclosed tax planning (with coefficient of -0.080** and -0.085 and t value of -4.675 and -2.448, respectively). These findings are in line with those of Garcia-Blandon et al. (2020) and indicate that firms using their external auditors for tax consultancy services pay tax in excess of the STR and in excess of the tax expenses reported in the income statement. My findings are not in line with Cook et al. (2008) and Hogan and Noga (2015), who find a positive association between APTS and tax planning. A possible reason for this could be the difference of the auditing and taxation regulatory environment. My findings are in line with those of Garcia-Blandon et al. (2020) in the Spanish context, which is expected to have similar wider regulatory requirements due to the common EU regulations.

I replaced my measure of APTS with the log value of audit fees instead of the percentage of total fees and my findings still hold. These findings confirm my hypothesis H4: that APTS are associated with tax planning. Hence, I do not reject this hypothesis.

Institutional ownership is negatively associated with total tax planning, disclosed tax planning and undisclosed tax planning (with coefficients of -0.174***, -0.103** and -0.086** and t values of -4.675, -2.816 and -2.448, respectively), indicating that firms with higher external institutional control report tax expenses higher than the STR and further pay higher taxes than the reported tax expenses. These findings are in line with Chan et al. (2013) and Bradshaw et al. (2019). I further replaced the institutional

ownership with government share of ownership and the associations with the total tax planning and disclosed tax planning are negative but not significant. The association with undisclosed tax planning is significantly positive, which indicates a tendency towards the findings of Chen et al. (2019). However, they do not use an equivalent measure of undisclosed tax planning, so a reliable comparison is not possible. Similarly, when using a wider measure of bloc ownership, to include management ownership with institutional ownership, the results are (less) significantly negative for the total (undisclosed) tax planning and not significant for disclosed tax planning. In light of the above findings and discussion, I do not reject my final hypothesis H5.

My findings of the significant negative associations of APTS and institutional ownership with all three measures of tax planning, except for the insignificant and positive association between APTS and disclosed tax planning, are important contributions to the existing literature. I provide evidence to the taxation and auditing regulators about the relevance of APTS within tax planning activities in favour of tax revenue collections for the state. Moreover, this control function of the auditors is important in light of the significantly positive association of tax affiliations and tax experience with tax planning found above for hypotheses 1 and 2. Similarly, the tax planning activities of firms with higher institutional ownership are controlled by the extra layer of external institutional control.

In line with the existing literature and my expectations, profit before tax, capital intensity, R&D intensity and inventory intensity have significantly positive associations with total tax planning (coefficient of 0.342^{***} and t value of 10.352; coefficient of 0.121^{***} and t value of 3.372; coefficient of 0.069^{**} and t value of 2.079; and coefficient of 0.053^{**} and t value of 2.012, respectively). Board size is significantly negatively

associated with total tax planning, with a coefficient of -0.096** and t value of -2.250. Finally, non-executive directors on the board, CEO duality and leverage are not significantly associated with total tax planning, but the negative direction of association is in line with the existing literature and with my expectations.

4.5.5 Further analysis and robustness checks

To further analyse my regression results, I run my regression models for both groups of strongly and weakly governed firms and the results are presented in Table 4.6. I run the models with the robust option and standardised beta coefficients are presented in the table, along with t statistics. Significance levels are presented as *** for $p < 0.01$, ** for $p < 0.05$ and * for $p < 0.1$.

Table 4.6 shows a significant positive association of tax affiliations with total tax planning (with coefficient of 0.085* and t value of 1.718) for strongly governed firms, as presented in column 1, and with disclosed tax planning (with coefficient of 0.191* and t value of 1.885) for weakly governed firms, as presented in column 5. These findings indicate that the positive association between tax affiliates on the board and total tax planning (disclosed tax planning) from the main analysis (Table 4.5) is driven by the strongly governed firms (weakly governed firms), as presented in column 1 (5). Hence, the weakly governed firms with tax affiliates on the board report fewer tax expenses but do not materialise on this saving in total, due to not significantly engaging in undisclosed tax planning, as shown in column 6. On the other hand, the strongly governed firms report less tax expenses and pay less in cash, making it an overall significant tax saving.

Table 4.6 also shows that the tax experience of the board is not significantly associated with any of the tax planning measures. The overall significant and positive association with total tax planning from Table 4.5 is not visible with either of the categories. Moreover, the association with disclosed tax planning for weakly governed firms is negative but not significant, as presented in column 5. This indicates that tax-experienced directors of weakly governed firms do not significantly engage in tax planning. This finding suggests that the positive association of tax experience is suppressed in strongly governed environments and it is not significant when internal governance is weak.

Professional qualifications on the board are significantly negatively associated with total tax planning in weakly governed firms (with coefficient of -0.158^{**} and t value of -2.298), as presented in column 4. My main findings for professional qualifications in Table 4.5 are negative but not significant.

APTS are not significantly associated with any of the measures of tax planning, and the negative signs of the relationships for strongly governed firms are consistent with the main finding in Table 4.5. A possible explanation for this is the auditors' reliance on the internal governance quality for tax planning matters, hence not significantly moderating the tax planning activities. However, the positive association between auditors' control and disclosed tax planning in Table 4.5 has changed to a negative association for weakly governed firms in column 5 of Table 4.6. This indicates that the auditors control all areas of tax planning in internally weak governance environments. A possible explanation for these negative associations not being statistically significant could be the significantly lower amount of tax planning for the weakly governed firms, as shown in the t tests presented in Table 4.3.

In strongly governed firms, institutional ownership is significantly negatively associated with total, disclosed and undisclosed tax planning (with coefficients of -0.227^{***}, -0.195^{***} and -0.098^{*} and t values of -4.107, -2.725 and -1.713, respectively). For weakly governed firms, this association is negative but not significant. This indicates that the external institutional control moderating tax planning negatively is only significant for strongly governed firms, possibly working in collaboration with the internally strong governance environment.

I further analyse my findings on disclosed tax planning for the combined sample (Table 4.5, column 2), for strongly governed firms (Table 4.6, column 2) and for weakly governed firms (Table 4.6, column 5) using financial statement disclosures on income taxes as per IAS 12. The disclosures consist of the income tax reconciliation between STR and ETR of a firm and the items in the reconciliation may disclose the specific tax planning activities adopted by the firm that resulted in the difference between its STR and ETR. I use the following three regression models and the results are presented in Table 4.7:

Table 4.5 Regression analysis: all firms

This table shows the results of the OLS regression to estimate total tax planning, disclosed tax planning and undisclosed tax planning using Regression Equations 1, 2 and 3, respectively. For each estimate, the results consist of standardised beta and t values in parentheses. *, ** and *** indicate significance at .1, .05 and .01, respectively. Variables are defined as in Table 4.2.

Independent variables	ES	Dependent variable: Tax Planning		
		Total Tax Planning	Disclosed Tax Planning	Undisclosed Tax Planning
		(1)	(2)	(3)
Tax Affiliation	+/-	0.074** (2.447)	0.099** (2.297)	-0.010 (-0.323)
Tax Experience	+	0.088** (2.124)	0.050 (0.904)	0.041 (1.012)
Professional Accountancy Qualifications	+	-0.042 (-1.044)	-0.001 (-0.023)	-0.027 (-0.679)
Auditors Provided Tax Services (APTS)	+/-	-0.080** (-2.355)	0.002 (0.063)	-0.085** (-2.144)
Institutional Ownership	-	-0.174*** (-4.675)	-0.103*** (-2.816)	-0.086** (-2.448)
Board Size	-	-0.096** (-2.250)	-0.121*** (-2.694)	0.006 (0.150)
Non-Executive Directors	-	-0.025 (-0.731)	0.001 (0.017)	-0.029 (-0.772)
CEO Duality	-	-0.050 (-1.553)	-0.021 (-0.740)	-0.038 (-1.055)
Size	+	0.078 (1.524)	0.141*** (2.914)	-0.035 (-0.710)
Profitability	+	0.342*** (10.352)	0.167*** (5.014)	0.200*** (5.769)
Leverage	-	-0.057 (-1.522)	-0.004 (-0.106)	-0.062 (-1.578)
R&D Intensity	+	0.121*** (3.372)	0.110*** (2.664)	0.028 (0.695)
Capital Intensity	+	0.069** (2.079)	-0.008 (-0.229)	0.078** (2.127)
Inventory Intensity	+	0.053** (2.012)	0.002 (0.067)	0.046* (1.659)
F value		7.439***	3.340***	3.242***
R Square		0.221	0.102	0.084
N		951	951	951
Robust		Yes	Yes	Yes
Industry dummy		Yes	Yes	Yes
Year dummy		Yes	Yes	Yes

Standardized beta coefficients; t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4.6 Regression analysis for strongly governed and weakly governed firms

Two sub-samples are created by splitting the main sample into highly governed firms and weakly governed firms based on the governance quality, which is measured as the proportion of independent directors to the board size. Firms with above (below) the median value of governance quality are classified as strongly (weakly) governed firms. For each sub-sample, this table shows the results of the OLS regression to estimate total tax planning, disclosed tax planning and undisclosed tax planning using Regression Equations 1, 2 and 3, respectively. For each estimate, the results consist of standardised beta and t values in parentheses. *, ** and *** indicate significance at .1, .05 and .01, respectively. Variables are defined as in Table 4.2.

Independent variables	Dependent variable: Tax planning					
	Strongly governed firms			Weakly governed firms		
	Total Tax Planning (1)	Disclosed Tax Planning (2)	Undisclosed Tax Planning (3)	Total Tax Planning (4)	Disclosed Tax Planning (5)	Undisclosed Tax Planning (6)
Tax Affiliation	0.085* (1.718)	0.059 (1.246)	0.032 (1.032)	0.043 (0.806)	0.191* (1.885)	-0.106 (-1.431)
Tax Experience	0.030 (0.652)	0.020 (0.382)	0.012 (0.238)	0.005 (0.079)	-0.102 (-1.424)	0.086 (1.515)
Professional Accountancy Qualifications	-0.002 (-0.032)	0.005 (0.101)	0.025 (0.473)	-0.158** (-2.298)	-0.074 (-1.003)	-0.102 (-1.376)
Auditors Provided Tax Services (APTS)	-0.031 (-0.562)	0.074 (1.283)	-0.103 (-1.642)	-0.070 (-1.304)	-0.035 (-0.654)	-0.042 (-0.676)
Institutional Ownership	-0.272*** (-4.107)	-0.195*** (-2.725)	-0.098* (-1.713)	-0.072 (-1.218)	-0.083 (-1.577)	-0.007 (-0.137)
Board Size	-0.158** (-2.479)	-0.207*** (-2.936)	0.011 (0.174)	-0.167** (-2.333)	-0.151** (-2.094)	-0.051 (-0.693)
Non-Executive Directors	0.060 (1.084)	-0.051 (-0.746)	0.096* (1.771)	-0.101** (-2.179)	-0.083 (-1.359)	-0.036 (-0.702)
CEO Duality	0.023 (0.418)	0.059 (1.448)	-0.030 (-0.447)	-0.016 (-0.361)	-0.043 (-0.934)	0.021 (0.436)
Size	0.164** (2.509)	0.277*** (3.661)	-0.064 (-1.018)	0.212** (2.390)	0.068 (0.849)	0.162* (1.758)
Profitability	0.257*** (5.230)	0.095* (1.715)	0.170*** (3.254)	0.440*** (5.973)	0.135* (1.857)	0.342*** (4.760)
Leverage	-0.138** (-2.370)	0.015 (0.242)	-0.166*** (-2.777)	-0.001 (-0.016)	0.004 (0.054)	-0.005 (-0.072)
R&D Intensity	0.004 (0.058)	0.205** (2.275)	-0.152** (-2.242)	0.108** (2.146)	0.065 (0.718)	0.057 (0.984)
Capital Intensity	0.073 (1.376)	-0.028 (-0.540)	0.109* (1.908)	0.014 (0.279)	-0.022 (-0.349)	0.032 (0.577)
Inventory Intensity	0.045 (1.141)	0.030 (0.678)	-0.004 (-0.094)	0.080 (1.421)	-0.042 (-1.112)	0.115** (1.969)
F value	4.219***	2.402***	2.121***	4.067***	1.995***	2.026***
R Square	0.297	0.171	0.164	0.317	0.147	0.209
N	390	390	390	383	383	383
Robust	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes

Standardized beta coefficients; t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

$$\begin{aligned}
TPD_{it} = & \beta_0 + \beta_1 TAX_AF_{it} + \beta_2 W_EXP_{it} + \beta_3 EDU_{it} + \beta_4 AUD_C_{it} + \beta_5 EXT_C_{it} \\
& + \beta_6 B_SIZE_{it} + \beta_7 NED_{it} + \beta_8 CEO_D_{it} + \beta_9 TA_{it} + \beta_{10} PBT_{it} + \beta_{11} LEV_{it} \\
& + \beta_{12} R\&D_{it} + \beta_{13} CAP_INT_{it} + \beta_{14} INV_INT_{it} + \sum_{n=1}^9 \beta_n IND_DUM_{it} \\
& + \sum_{n=1}^6 \beta_n YEAR_DUM_i + \varepsilon_{it}
\end{aligned}$$

Equation 4

$$\begin{aligned}
TADJ_{it} = & \beta_0 + \beta_1 TAX_AF_{it} + \beta_2 W_EXP_{it} + \beta_3 EDU_{it} + \beta_4 AUD_C_{it} + \beta_5 EXT_C_{it} \\
& + \beta_6 B_SIZE_{it} + \beta_7 NED_{it} + \beta_8 CEO_D_{it} + \beta_9 TA_{it} + \beta_{10} PBT_{it} + \beta_{11} LEV_{it} \\
& + \beta_{12} R\&D_{it} + \beta_{13} CAP_INT_{it} + \beta_{14} INV_INT_{it} + \sum_{n=1}^9 \beta_n IND_DUM_{it} \\
& + \sum_{n=1}^6 \beta_n YEAR_DUM_i + \varepsilon_{it}
\end{aligned}$$

Equation 5

$$\begin{aligned}
TUNC_{it} = & \beta_0 + \beta_1 TAX_AF_{it} + \beta_2 W_EXP_{it} + \beta_3 EDU_{it} + \beta_4 AUD_C_{it} + \beta_5 EXT_C_{it} \\
& + \beta_6 B_SIZE_{it} + \beta_7 NED_{it} + \beta_8 CEO_D_{it} + \beta_9 TA_{it} + \beta_{10} PBT_{it} + \beta_{11} LEV_{it} \\
& + \beta_{12} R\&D_{it} + \beta_{13} CAP_INT_{it} + \beta_{14} INV_INT_{it} + \sum_{n=1}^9 \beta_n IND_DUM_{it} \\
& + \sum_{n=1}^6 \beta_n YEAR_DUM_i + \varepsilon_{it}
\end{aligned}$$

Equation 6

where TPD is tax on permanent differences between accounting and tax regulations reported in the tax reconciliation, TADJ is the tax of adjustments reported in the income tax reconciliation, TUNC is tax on uncategorised items reported in the tax reconciliation, and the other variables are the same as in the main regression models (i.e. Equations 1-3). All continuous variables are winsorized at the 1st and 99th percentiles to mitigate the effect of outliers.

The significantly positive association between tax affiliations and disclosed tax planning from Table 4.5 column 2 can be explained by the tax savings on adjustments

and tax savings on uncategorised items (with coefficients of 0.089 and 0.054 and t values of 1.677 and 1.704, respectively), as presented in columns 2 and 3 of Table 4.7, respectively. This indicates that directors with tax affiliations use prior-year tax adjustment and deferred tax adjustments and report uncategorised items, which collectively lead to a reduction in tax expenses reported in the income statement with respect to the STR.

The negative association between professional qualifications and disclosed tax planning for weakly governed firms (Table 4.6, column 5) can be explained by tax savings on permanent differences (with coefficient of -0.157* and t value of -1.884) as presented in Table 4.7, column 7. This indicates that directors with professional accountancy qualifications serving on weakly governed firms are associated with fewer claims for permanent tax differences by these firms.

For the overall sample, the negative association between external institutional control and disclosed tax planning from Table 4.5 column 2 can be explained by tax savings on permanent differences (with coefficient of -0.144*** and t value of -2.927) as presented in column 1. Similarly, for strongly governed firms, the negative association from Table 4.6 column 2 can also be explained by tax savings on permanent difference (with coefficient of -0.251** and t value of -2.378), as presented in column 4.

The tax planning reduction associated with institutional investors for strongly governed firms using permanent differences is replaced with professional accountancy qualifications for the weakly governed firms. This indicates that the

professional accountancy qualifications possibly substitute the role of external institutional control for the weakly governed firms.

Table 4.7 Regression analysis for disclosed tax planning strategies

This table shows the results of the OLS regression using Equations 4, 5 and 6 to estimate the dependent variables: tax on permanent differences, tax on adjustments and other items, respectively. These dependent variables are hand-collected from income tax disclosures made under International Accounting Standard 12 'income tax' and presented as a percentage of profit before tax. The results for these three regression models are presented for all firms in columns 1, 2 and 3, for strongly governed firms in columns 4, 5 and 6 and for weakly governed firms in columns 7, 8 and 9, respectively. Strongly governed and weakly governed firms are defined as explained previously in Table 4.6, and all other variables are defined as in Table 4.2. For each estimate, the results consist of standardised beta and t values in parentheses. *, ** and *** indicate significance at .1, .05 and .01, respectively

Independent variables	Dependent variable: Disclosed tax planning strategies								
	All firms			Strongly governed firms			Weakly governed firms		
	Permanent differences (1)	Tax adjustments (2)	Other items (3)	Permanent differences (4)	Tax adjustments (5)	Other items (6)	Permanent differences (7)	Tax adjustments (8)	Other items (9)
Tax Affiliation	0.019 (0.862)	0.089* (1.677)	0.054* (1.704)	-0.008 (-0.189)	0.075 (1.067)	0.061 (1.595)	0.036 (0.658)	0.143 (1.312)	0.146 (1.081)
Tax Experience	0.054 (1.028)	-0.030 (-0.668)	0.049 (1.125)	-0.017 (-0.283)	0.040 (0.671)	-0.006 (-0.122)	-0.016 (-0.228)	-0.094 (-1.440)	-0.036 (-0.597)
Professional Accountancy Qualifications	-0.009 (-0.215)	0.014 (0.305)	-0.005 (-0.142)	-0.010 (-0.142)	0.006 (0.094)	0.022 (0.498)	-0.157* (-1.844)	0.055 (0.590)	-0.019 (-0.391)
Auditor-Provided Tax Services (APTS)	-0.002 (-0.059)	-0.010 (-0.266)	0.021 (0.618)	0.075 (1.391)	-0.024 (-0.373)	0.062 (1.066)	0.000 (0.008)	-0.024 (-0.465)	-0.047 (-0.880)
Institutional Ownership	-0.144*** (-2.927)	0.025 (0.841)	-0.030 (-0.882)	-0.251** (-2.378)	0.022 (0.382)	-0.035 (-0.754)	-0.066 (-1.239)	0.009 (0.227)	-0.163** (-2.338)
Board Size	-0.091** (-2.089)	-0.078* (-1.952)	0.011 (0.258)	-0.161** (-2.363)	-0.187*** (-2.720)	0.073 (0.846)	-0.177** (-2.583)	-0.029 (-0.489)	0.007 (0.104)
Non-Executive Directors	0.028 (0.711)	-0.051 (-1.359)	0.032 (0.524)	0.036 (0.455)	-0.067 (-1.155)	-0.086 (-1.336)	-0.072 (-1.421)	-0.054 (-0.970)	0.052 (0.898)
CEO Duality	0.003 (0.080)	-0.033 (-1.378)	0.004 (0.127)	0.069 (1.467)	-0.005 (-0.129)	0.037 (1.003)	0.039 (0.832)	-0.086** (-2.183)	-0.008 (-0.171)
Size	0.052 (1.052)	0.077* (1.805)	0.069 (1.171)	0.184*** (2.612)	0.159** (2.389)	0.020 (0.232)	0.114 (1.585)	0.005 (0.070)	-0.034 (-0.394)
Profitability	0.259*** (6.837)	-0.068** (-2.043)	0.006 (0.170)	0.142*** (2.596)	-0.047 (-0.942)	-0.017 (-0.296)	0.339*** (4.714)	-0.106 (-1.599)	-0.088 (-1.370)
Leverage	0.013 (0.406)	0.072* (1.739)	-0.133*** (-2.639)	0.046 (0.816)	0.127** (2.174)	-0.184** (-2.101)	0.023 (0.332)	0.026 (0.352)	-0.141** (-2.178)
R&D Intensity	0.191*** (4.097)	-0.044 (-1.190)	-0.025 (-0.969)	0.223** (2.240)	0.115 (1.028)	-0.088 (-1.574)	0.119 (1.272)	-0.030 (-0.506)	0.004 (0.103)
Capital Intensity	-0.005 (-0.166)	0.011 (0.277)	-0.004 (-0.132)	-0.072 (-1.570)	0.066 (1.084)	0.005 (0.092)	-0.054 (-0.952)	0.034 (0.499)	-0.028 (-0.486)
Inventory Intensity	0.042* (1.713)	-0.047* (-1.948)	-0.003 (-0.080)	0.088** (2.057)	-0.059 (-1.157)	-0.019 (-0.341)	0.052 (1.390)	-0.071** (-2.083)	-0.090** (-1.967)
F value	3.234***	2.247**	1.359	2.159**	2.007**	1.086	2.263**	1.853***	1.158
R Square	0.099	0.051	0.045	0.172	0.105	0.089	0.175	0.116	0.114
N	951	951	951	390	390	390	383	383	383
Robust	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Standardized beta coefficients; t statistics in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Extending my robustness checks, I run all six regression models after including a dichotomous dummy variable for governance quality with a value of 1 if the proportion of independent directors on the board for each year is more than the median value of independent directors on the board for that year. The regression models previously used (Equations 1 – 6) are revised to include the governance quality dummy variable, as presented in the equations below:

$$\begin{aligned}
TP_TOTAL_{it} = & \beta_0 + \beta_1 TAX_AF_{it} + \beta_2 W_EXP_{it} + \beta_3 EDU_{it} + \beta_4 AUD_C_{it} + \beta_5 EXT_C_{it} \\
& + \beta_6 B_SIZE_{it} + \beta_7 NED_{it} + \beta_8 CEO_D_{it} + \beta_9 TA_{it} + \beta_{10} PBT_{it} + \beta_{11} LEV_{it} \\
& + \beta_{12} R\&D_{it} + \beta_{13} CAP_INT_{it} + \beta_{14} INV_INT_{it} + \beta_{15} GOV_Q_{it} \\
& + \sum_{n=1}^9 \beta_n IND_DUM_{it} + \sum_{n=1}^6 \beta_n YEAR_DUM_i + \varepsilon_{it}
\end{aligned}$$

Equation 7

$$\begin{aligned}
TP_DISC_{it} = & \beta_0 + \beta_1 TAX_AF_{it} + \beta_2 W_EXP_{it} + \beta_3 EDU_{it} + \beta_4 AUD_C_{it} + \beta_5 EXT_C_{it} \\
& + \beta_6 B_SIZE_{it} + \beta_7 NED_{it} + \beta_8 CEO_D_{it} + \beta_9 TA_{it} + \beta_{10} PBT_{it} + \beta_{11} LEV_{it} \\
& + \beta_{12} R\&D_{it} + \beta_{13} CAP_INT_{it} + \beta_{14} INV_INT_{it} + \beta_{15} GOV_Q_{it} \\
& + \sum_{n=1}^9 \beta_n IND_DUM_{it} + \sum_{n=1}^6 \beta_n YEAR_DUM_i + \varepsilon_{it}
\end{aligned}$$

Equation 8

$$\begin{aligned}
TP_UNDISC_{it} = & \beta_0 + \beta_1 TAX_AF_{it} + \beta_2 W_EXP_{it} + \beta_3 EDU_{it} + \beta_4 AUD_C_{it} + \beta_5 EXT_C_{it} \\
& + \beta_6 B_SIZE_{it} + \beta_7 NED_{it} + \beta_8 CEO_D_{it} + \beta_9 TA_{it} + \beta_{10} PBT_{it} + \beta_{11} LEV_{it} \\
& + \beta_{12} R\&D_{it} + \beta_{13} CAP_INT_{it} + \beta_{14} INV_INT_{it} + \beta_{15} GOV_Q_{it} \\
& + \sum_{n=1}^9 \beta_n IND_DUM_{it} + \sum_{n=1}^6 \beta_n YEAR_DUM_i + \varepsilon_{it}
\end{aligned}$$

Equation 9

$$\begin{aligned}
TPD_{it} = & \beta_0 + \beta_1 TAX_AF_{it} + \beta_2 W_EXP_{it} + \beta_3 EDU_{it} + \beta_4 AUD_C_{it} + \beta_5 EXT_C_{it} \\
& + \beta_6 B_SIZE_{it} + \beta_7 NED_{it} + \beta_8 CEO_D_{it} + \beta_9 TA_{it} + \beta_{10} PBT_{it} + \beta_{11} LEV_{it} \\
& + \beta_{12} R\&D_{it} + \beta_{13} CAP_INT_{it} + \beta_{14} INV_INT_{it} + \beta_{15} GOV_Q_{it} \\
& + \sum_{n=1}^9 \beta_n IND_DUM_{it} + \sum_{n=1}^6 \beta_n YEAR_DUM_i + \varepsilon_{it}
\end{aligned}$$

Equation 10

$$\begin{aligned}
TADJ_{it} = & \beta_0 + \beta_1 TAX_AF_{it} + \beta_2 W_EXP_{it} + \beta_3 EDU_{it} + \beta_4 AUD_C_{it} + \beta_5 EXT_C_{it} \\
& + \beta_6 B_SIZE_{it} + \beta_7 NED_{it} + \beta_8 CEO_D_{it} + \beta_9 TA_{it} + \beta_{10} PBT_{it} + \beta_{11} LEV_{it} \\
& + \beta_{12} R\&D_{it} + \beta_{13} CAP_INT_{it} + \beta_{14} INV_INT_{it} + \beta_{15} GOV_Q_{it} \\
& + \sum_{n=1}^9 \beta_n IND_DUM_{it} + \sum_{n=1}^6 \beta_n YEAR_DUM_i + \varepsilon_{it}
\end{aligned}$$

Equation 11

$$\begin{aligned}
TUNC_{it} = & \beta_0 + \beta_1 TAX_AF_{it} + \beta_2 W_EXP_{it} + \beta_3 EDU_{it} + \beta_4 AUD_C_{it} + \beta_5 EXT_C_{it} \\
& + \beta_6 B_SIZE_{it} + \beta_7 NED_{it} + \beta_8 CEO_D_{it} + \beta_9 TA_{it} + \beta_{10} PBT_{it} + \beta_{11} LEV_{it} \\
& + \beta_{12} R\&D_{it} + \beta_{13} CAP_INT_{it} + \beta_{14} INV_INT_{it} + \beta_{15} GOV_Q_{it} \\
& + \sum_{n=1}^9 \beta_n IND_DUM_{it} + \sum_{n=1}^6 \beta_n YEAR_DUM_i + \varepsilon_{it}
\end{aligned}$$

Equation 12

The results for these regression models are presented in Table 4.8.

Firms with tax affiliate directors on the board engage in total tax planning and disclosed tax planning (with coefficients of 0.082** and 0.177** and t values of 2.352 and 2.342, respectively); and this association with disclosed tax planning can be associated with tax savings on adjustment and tax savings on uncategorised items (with coefficients of 0.114* and 0.0700* and t values of 1.794 and 1.784, respectively). Similarly, institutional ownership is significantly associated with total tax planning, disclosed tax planning and undisclosed tax planning (with coefficients of -0.185***, -0.144*** and -0.063* and t values of -4.338, -3.137 and -1.655, respectively) which support my findings in Table 4.5 and Table 4.6. These findings confirm my previous findings on the positive association between tax-affiliated directors on the board and tax planning (Table 4.5, 4.6 and 4.7).

Table 4.8 Regression results with yearly governance quality

This table shows the results of the OLS regression using Equations 7 – 12, presented in columns 1 – 6, to estimate total tax planning, disclosed tax planning, undisclosed tax planning, tax on permanent differences, tax on adjustments and tax on other items, respectively. Equations 7 – 12 are revised versions of Equations 1 – 6 with an additional dichotomous dummy variable for governance quality, with a value of 1 if the proportion of independent directors on the board for each year is more than the median value of independent directors on the board for that year; otherwise the value is 0. For each estimate, the results consist of standardised beta and t values in parentheses. *, ** and *** indicate significance at .1, .05 and .01, respectively.

Independent variables	Dependent variable: Tax planning			Dependent variable: Disclosed tax planning strategies		
	Total Tax Planning	Disclosed Tax Planning	Undisclosed Tax Planning	Tax on Permanent differences	Tax on Adjustments	Tax on Other items
	(1)	(2)	(3)	(4)	(5)	(6)
Ind Tax Only Affiliation	0.082** (2.352)	0.117** (2.342)	-0.012 (-0.348)	0.016 (0.587)	0.114* (1.794)	0.070* (1.784)
Tax Expertise	0.031 (0.848)	-0.034 (-0.845)	0.058 (1.636)	-0.021 (-0.473)	-0.035 (-0.812)	0.002 (0.058)
Tax & Pro. Acc. Qualifications	-0.081* (-1.853)	-0.025 (-0.631)	-0.041 (-0.978)	-0.073 (-1.580)	0.047 (0.894)	-0.001 (-0.043)
Auditors' Control	-0.063* (-1.719)	0.035 (0.892)	-0.097** (-2.206)	0.048 (1.287)	-0.013 (-0.329)	0.020 (0.503)
External Institutional Control	-0.185*** (-4.338)	-0.144*** (-3.137)	-0.063* (-1.655)	-0.170*** (-2.652)	0.004 (0.108)	-0.053 (-1.546)
Board Size	-0.157*** (-3.447)	-0.178*** (-3.818)	-0.010 (-0.240)	-0.158*** (-3.646)	-0.101** (-2.276)	0.033 (0.643)
Non-Executive Directors	-0.010 (-0.256)	-0.060 (-1.316)	0.033 (0.904)	-0.006 (-0.119)	-0.057 (-1.489)	-0.039 (-0.852)
CEO Duality	0.008 (0.226)	0.003 (0.114)	-0.001 (-0.030)	0.059** (1.996)	-0.051** (-2.038)	-0.005 (-0.184)
Size	0.161*** (3.401)	0.189*** (3.457)	0.007 (0.143)	0.145*** (2.754)	0.070 (1.624)	0.029 (0.512)
Profitability	0.328*** (8.436)	0.107** (2.427)	0.236*** (5.632)	0.213*** (4.500)	-0.083** (-2.199)	-0.031 (-0.763)
Leverage	-0.072* (-1.750)	0.020 (0.451)	-0.096** (-2.216)	0.026 (0.666)	0.092* (1.930)	-0.143** (-2.498)
R&D Intensity	0.078** (2.059)	0.139** (2.544)	-0.028 (-0.694)	0.182*** (2.998)	0.019 (0.367)	-0.034 (-1.231)
Capital Intensity	0.042 (1.174)	-0.031 (-0.814)	0.074* (1.857)	-0.066* (-1.932)	0.047 (1.040)	-0.003 (-0.066)
Inventory Intensity	0.069** (2.372)	0.006 (0.197)	0.057* (1.801)	0.075*** (2.800)	-0.062** (-2.164)	-0.029 (-0.729)
Yearly Governance Quality	-0.016 (-0.421)	0.031 (0.775)	-0.027 (-0.682)	0.012 (0.275)	0.032 (0.763)	-0.001 (-0.024)
F value	6.335***	3.212***	3.383***	3.137***	2.763***	1.541**
R Square	0.258	0.120	0.135	0.131	0.081	0.044
N	773	773	773	773	773	773
Robust	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes

Standardized beta coefficients; t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Further, in Table 4.8, tax experience on the board is not significantly associated with any of the tax planning measures or with any component of disclosed tax planning. Hence, its significant positive association with total tax planning observed in the main model (Table 4.5, column 1) does not retain its significance when tested with respect to the governance quality (Tables 4.6, 4.7 and 4.8).

Professional accountancy qualifications, not significantly associated with any measure of tax planning in the main model (Table 4.5), are significantly negatively associated with total tax planning (with coefficient of -0.081^* and t value of -1.853), which confirms my findings from Table 4.6 column 4. Similarly, the significant negative association of APTS with total tax planning and undisclosed tax planning from Table 4.5, which is not significant against the governance quality split in Table 4.6, is significant (with coefficients of -0.063^* and -0.097^* and t values of -1.719 and -2.206 , respectively).

4.6. Conclusion

This chapter analyses the board of directors' tax expertise, APTS and institutional ownership and the impact of these institutions on tax planning activities of UK domiciled listed firms. It finds that the tax affiliations of the board members positively affect tax planning. This positive association results in a significant reduction of real tax payments below the STR for strongly governed firms but only in a significant reduction of reported tax expenses below the STR for weakly governed firms. In the absence of any previous relevant study on this in the UK context, the positive association of tax affiliations provides an important contribution to the existing tax research in the UK in the first instance, and secondly it highlights the importance of

governance quality for tax planning, which results in savings in terms of tax payments. Weakly governed firms with professional accountancy qualified directors on the board engage less in tax planning and pay taxes in excess of STR. Professionally qualified directors engage in tax planning strategies, resulting in permanent differences between accounting and tax profits. This finding is robust and is not associated with any other qualifications or overall education level of the board.

This chapter finds that firms with tax experienced directors engage more in tax planning, which confirms the previous evidence from outside the UK. However, this finding does not hold for strongly and weakly governed firms, indicating that the tax planning contributions of tax experienced directors are not significantly associated with internal governance quality. This finding indicates that the continuously updating tax-planning-related regulations, in addition to the usual changes in tax rates, may leave tax work experience not significant in terms of its association with tax planning. Hence, tax experienced directors would be less effective in any tax-planning-relevant governance role on the board of directors. This finding could be useful for regulators and management when seeking a tax expert on the board, as I find that work experience is not significantly associated with tax planning.

These findings provide insight for the relevant professional tax and accountancy institutes regarding the respective roles of their affiliates and qualifications in corporate tax planning in the UK. Tax affiliates on the board bring significant overall tax savings for strongly governed firms, and professional accountancy qualified directors on the board are associated with higher tax payments for weakly governed firms. These findings could be used by the tax authorities to shortlist or identify potential tax planning practices for further investigation. HMRC, like any other tax authority, has

limited funds to carry out any tax investigations to yield “good value for money” (NAO 2020), for which my findings could be handy for shortlisting.

This chapter provides unique UK evidence for statutory auditors’ association with reductions in corporate tax planning, which is not in line with evidence from the dominant US-based research but is line with recent findings from a Spanish study. Auditors do not control tax planning engagements of firms in strong internal control environments, indicating their supplementary governance role for the internal governance, which disappears in a strong internal control environment. I recommend the involvement of auditors in providing tax consultancy services to support internal governance quality. Auditors’ role in relation to tax planning activities needs further attention in the UK context, as they provide coercive control as auditors on their statutory duty. Their institutional characteristics – for example, Big 4 firms – may provide further insight on their contribution towards their clients’ tax planning activities beyond the actual tax consultancy services they provide.

This chapter further finds external institutional control to significantly reduce tax planning. This is persistent for strongly governed firms but not significant for weakly governed firms. These findings confirm the interaction between the external governance mechanism (i.e. institutional ownership) and the internal governance quality, as studied by Baber et al. (2012). These findings suggest a complementary relationship between institutional ownership and internal governance quality. The findings are robust and are in line with the existing literature. This negative association is not significant for weakly governed firms, indicating that institutional ownership moderates tax planning in association with the internal governance quality but is not significant for weakly governed firms.

Formal affiliations with taxation and accountancy professional institutions are studied in this research; however, any informal connections of the board and its committees via social networking could provide further evidence of any mimetic adoption of tax planning activities. Socially connected board members may lead to tax planning similarities in a changing regulatory and economically challenging environment. Moreover, statutory auditors' affiliations with a firm's tax planning beyond APTS need further research to understand my findings in the wider context of auditors' role and their independence.

CHAPTER 5

CONCLUSION

This thesis addresses three important areas of tax planning research using a panel data set of hand-collected tax planning data, for UK domiciled non-financial firms listed on the London Stock Exchange from 2010 to 2015. Firstly, the thesis analyses the tax planning data using two of the tax planning measures (total tax planning and disclosed tax planning) adopted in the literature. The study further proposes a third measure of tax planning (undisclosed tax planning) that allows to analyse the undisclosed component of all tax planning activities (total tax planning). This analysis extends to further disintegrate disclosed tax planning to eight specific tax planning strategies using IAS 12 disclosures and investigates consistency of use of these strategies by firms.

Secondly, this thesis studies firms' incentives for tax planning in relation to international orientation, risk, free operating cashflows and firm growth in a signalling theory framework. The existing tax planning literature mainly studies tax planning in an agency theory context leading to a research gap in the literature (Wilde and Wilson 2018), which is addressed by the thesis. It further extends the analysis to assess the impact of tax planning on firm value which is important in the era of increasing public awareness about firms' tax planning engagements (Abdul Wahab and Holland 2012). This thesis studies firms' tax planning incentives in the post-financial crisis period of financial constraints and financial distress (Vithessonthi and Tongurai 2015; Edwards et al. 2016) when firms may have engaged in tax planning activities to generate internal funds.

Finally, this thesis analyses the impact of corporate governance mechanisms of the board of directors' tax affiliations, tax experience and professional accountancy qualifications, and auditors' and institutional control, on firms' tax planning activities in an institutional theory framework. The existing literature on relationship of corporate governance with tax planning is grounded in the agency theory framework and wider external institutional influences on tax planning are not addressed in the literature (Kovermann and Velte 2019), which is addressed by this thesis. Similarly, the impact of the board's tax expertise on firms' tax planning activities has not been studied in the UK, hence, the thesis contributes to the existing tax planning literature and makes important recommendations for HMRC and firms' management.

5.1. Summary of Findings and Implications

5.1.1 Tax Planning Measurement

This research finds that larger firms are more involved in tax planning, as they have access to more resources to engage in tax planning activities. These firms use a combination of disclosed and undisclosed tax planning, which leads to overall low payments of taxes. Larger firms engage in disclosed tax planning, reducing their tax expenses, and then they do not engage in undisclosed tax planning, increasing their tax payments with respect to the expenses report. The former increases their after-tax earnings and the latter improves their relations with the tax authorities and possibly reduces their chances of being selected for a tax audit.

This research further finds that more profitable firms engage less in tax planning despite having more resources to invest in tax planning. This finding suggests that,

firms reporting large profits send a positive signal to the market and maintain a responsible citizen image by paying taxes in excess of the statutory tax rate. On the other hand, firms reporting smaller profits may have access to tax reliefs that may have disproportionality reduced their tax bills. Firms reporting above-average profits benefit the most from tax planning due to not being under the spotlight as they are not among the largest firms in the market and having sufficient resources to invest in tax planning.

Finally, this research highlights that the decreasing corporation tax rates resulting in reducing firms' tax payments will lead to lower tax revenue collections by HMRC unless multinational firms are motivated to increase the reporting of their taxable profits in the UK to take advantage of the lower corporation tax rates in the UK. The tax gap analysis published by HMRC claims a reduction in this gap, but that can be mainly associated with reductions in corporation tax rates, as the collection in monetary terms has stayed constant over the period investigated (HMRC 2016).

The new tax planning measure proposed here may help to understand firms' engagement in different tax planning activities and their overall approach towards tax planning by analysing the undisclosed component of their total tax planning. Moreover, the decomposition of disclosed tax planning into eight components using the hand-collected data from the annual reports is unique evidence of firms reporting their tax planning activities. These components have not been studied in periods of declining corporation tax rates and provide evidence for the need for future research in the UK.

5.1.2 Tax planning incentives for UK firms and its impact on firm value

This analysis finds that internationally oriented firms are not involved in total tax planning and undisclosed tax planning to pay taxes below the statutory tax rate, this is contrary to the existing public opinion that MNEs pay fewer taxes in the UK and this also against the existing literature (Mills et al., 1998; Rego, 2003; Kraft, 2014). However, the findings reveal that MNEs initially paid lower taxes in 2010 to 2012 but later the reducing tax rates in the UK turned the statistics in their favour in 2013 to 2015. No significant association is found between the different measures of tax planning and firms' risk, free cashflow or firms' growth potential, indicating that UK firms do not engage in tax planning to generate internal funds from tax savings to pursue their growth strategies. These findings further suggest that UK listed firms do not engage in tax planning, in order to signal a positive contribution to the society and to avoid any bad publicity associated with tax planning.

This analysis finds total tax planning and disclosed tax planning negatively impacting firm value and undisclosed tax planning to have no impact on firm value. Moreover, tax planning activities that lead to information asymmetry due to the lack of disclosure are negatively valued by the market. These activities are disclosed under IAS 12 as permanent differences between accounting profits and taxable profits, overseas tax rate differences, prior year tax adjustments and uncategorised differences reported by firms. These findings further strengthen the signalling theory view on appropriate disclosures to reduce the information asymmetry associated with tax planning.

An implication of these findings is that UK domiciled firms should be encouraged to report their tax affairs domestically (in the UK) to have a positive impact on their market value. On the other hand, the tax authorities should engage in public

awareness activities to strengthen the negative market valuation of tax planning activities, which may reduce firms' motivations to engage in tax planning.

5.1.3 Impact of Corporate Governance on Tax Planning

The study finds that firms with tax experienced directors engage more in tax planning, which confirms the previous evidence from outside the UK (Taylor and Richardson 2014). However, this finding is not related with the corporate governance level of firms, indicating that the tax planning contributions of tax experienced directors, are not significantly associated with the internal governance quality. Furthermore, tax affiliates on the board result in significant overall tax savings for strongly governed firms, and professional accountancy qualified directors on the board are associated with more tax payments for weakly governed firms. These findings on the three key forms of tax expertise among directors on the board provide evidence for the interaction of external institutions with firms' internal governance mechanisms.

This analysis finds that auditors' negative association with tax planning is not significant in the strong internal control environment indicating their supplementary governance role for internal governance disappears in strong internal control environments. On the other hand, the institutional ownership shows a complementary governance role, as it reduces tax planning only in environments of strong internal governance. The involvement of auditors in providing tax consultancy services to support internal governance quality is therefore recommended and this finding could be useful for regulators and management when assessing tax expertise of the board.

5.1.4 Practical Implications

My thesis has important practical implications for policy makers, tax authorities and firms. Firstly, the thesis provides evidence for tax authorities to promote market awareness about the financial implications of the overall tax planning activities of firms by publishing reports and running campaigns to maintain the negative valuation of these activities by the market. Tax authorities can indirectly restrict firms' engagement in tax planning by running such campaigns. Tax affiliates on the board bring significant overall tax savings for strongly governed firms, and professional accountancy qualified directors on the board are associated with higher tax payments for weakly governed firms. These findings could be used by the tax authorities as an initial 'picking technique' to shortlist or identify potential tax planning practices for further investigation. HMRC, like any other tax authority, has limited funds to carry out any tax investigations to yield "good value for money" (NAO 2020), for which my findings could be handy for shortlisting.

Secondly, my findings indicate that the continuously updating tax-planning-related regulations, in addition to the usual changes in tax rates, may leave tax work experience not significant in terms of its association with tax planning. Hence, tax experienced directors would be less effective in any tax-planning-relevant governance role on the board of directors. This finding could be useful for regulators and management when seeking a tax expert on the board, as I find that work experience is not significantly associated with tax planning.

Finally, my research provides unique UK evidence for statutory auditors' association with reductions in corporate tax planning. Auditors do not control tax planning engagements of firms in strong internal control environments, indicating their supplementary governance role for the internal governance, which disappears in a

strong internal control environment. I recommend the involvement of auditors in providing tax related services to support internal governance quality. Furthermore, auditors should be involved in providing tax related services as this will be financially beneficial for firms' due to the knowledge 'spill-over' effect.

5.2. Limitations and Suggestions for Future Research

This research is based on disclosed financial information, some of which is hand collected; however, any non-financial disclosures in the annual report could facilitate further understanding of firms' tax planning activities. In the signalling theory context, firms may provide non-financial footnotes to clarify their tax planning position to the market. A textual analysis of any management assertions supporting the income tax reconciliation in the financial statement and any wider information in the annual report may provide further insight into tax planning.

Cash ETR calculation is the ratio of tax payments to profit before tax for an accounting period. The numerator i.e., tax payments are not delayed by one year as the sample firms in the present study pay their tax liability in advance in four instalments where the final instalment payment is included in the cash flow statement of the following accounting period. Hence, there is a partial time delay of a quarter of tax payments to following accounting period. Since the final payment is a balancing payment and is not of the same amount as in the for the first three payments, it is not possible to correctly workout the delayed instalment in each accounting period. It is therefore a limitation of the present study.

The sampling strategy explained in Chapters 2, 3 and 4 aims to have a balanced set of panel data. Any firms with missing data for a part of the sample period are completely excluded from the sample. Similarly, any firms that became delisted during the sample period are also completely excluded from the sample. This ensures that a balance set of firms are represented every year to capture impact of decreasing tax rates on tax planning strategies of the firms. However, this results in survivorship bias in the sample which is a limitation of present study.

The institutional theory framework used in this research includes wider formal interactions of firms with a set of external institutions. The framework could further extend to include any informal interactions of the firms' directors, such as social networking, and the impact of these interactions on the tax planning activities adopted by firms. Similarly, the internal governance institutions, such as audit committees, could be included to extend the institutional framework used by this research, which uses an overall measure of internal governance.

This research highlights the relevance of the reductions in corporation tax rates to firms' tax planning activities in the UK. A comparative study between a period with stable statutory tax rates (1998 - 2008) and a period with reducing tax rates (2009 - 2019) may highlight the differential impact of both policies on firms. This comparative study could extend as a time series analysis by including the period with previous statutory tax reductions.

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APPENDICES

Appendix A: GSK Income Tax Reconciliation

Reducing corporation tax rate in the UK

Reported in the financial statements for 31.12.2015

Reconciliation of taxation on Group profits	2015	2015	2014	2014	2013	2013
	£m	%	£m	%	£m	%
Profit before tax	10,526		2,968		6,647	
UK statutory rate of taxation	2,131	20.25	638	21.5	1,545	23.2
Differences in overseas taxation rates	1,035	9.8	406	13.7	196	2.9
Benefit of intellectual property incentives	(286)	(2.7)	(323)	(10.9)	(189)	(2.8)
R&D credits	(38)	(0.4)	(72)	(2.4)	(88)	(1.3)
Inter-company inventory profit	(16)	(0.1)	(27)	(0.9)	(121)	(1.8)
Impact of share-based payments	12	0.1	31	1.0	(2)	–
Losses not recognised/(previously unrecognised losses)	31	0.3	(205)	(6.9)	(18)	(0.3)
Permanent differences on disposals and acquisitions	(248)	(2.4)	23	0.8	(227)	(3.4)
Other permanent differences	79	0.8	264	8.9	301	4.5
Re-assessments of prior year estimates	(578)	(5.5)	(617)	(20.8)	(197)	(3.0)
Disposal of associate	–	–	–	–	(67)	(1.0)
Tax on unremitted earnings	32	0.3	19	0.6	20	0.3
Deferred tax and other adjustments on restructuring	–	–	–	–	(134)	(2.0)
Tax charge / tax rate	2,154	20.5	137	4.6	1,019	15.3

Disclosed tax planning

Undisclosed tax planning: Difference between tax charge and tax paid

Consolidated cash flow statement for the year ended 31 December 2015	Notes	2015	2014	2013
		£m	£m	£m
Cash flow from operating activities				
Profit after taxation for the year		8,372	2,831	5,628
Adjustments reconciling profit after tax to operating cash flows	36	-3,741	3,453	2,871
Cash generated from operations		4,631	6,284	8,499
Taxation paid		-2,062	-1,108	-1,277
Net cash inflow from operating activities		2,569	5,176	7,222

The figure above is taken from the income tax disclosure presented in the 'notes' sections of annual report of GSK Ltd prepared to 31 December 2015. The 2015 values are presented in £m and in %, starting with profit before tax of £10,526m. As required by IAS 12, the nominal tax expense is calculated using the UK statutory tax rate (STR) of 20.25 that was applicable on the taxable profits of the company. The STR for the

Finance Act (FA) 2015 was 20% applicable for the period 1 April 2015 to 31 December 2016. As the accounting period of GSK Ltd (1 January 2015 to 31 December 2015) does not match with the FA2015, profits for the first quarter of the accounting period are taxed at STR for FA2014 which was 21% resulting in the used STR of 20.25% ($21\% \times 3/12 + 20\% \times 9/12$) and nominal tax of £2,131m.

This nominal profit increases due to higher foreign tax rates, impact of share-based payments, loss not recognised, other payment differences and tax on unremitted earnings. Similarly, this nominal tax expense decreases because of the benefit of intellectual property incentive, R&D credits, inter-company inventory profits, permanent difference on disposal of acquisitions and re-assessment of prior year estimates. With the combined effect of these adjustments, the tax expense reported in the income statements was £2.154m (Effective Tax Rate (ETR) of 20.5% of profit before tax).

The difference between the STR and ETR ($20.25\% - 20.50\% = -0.25\%$) is 'disclosed tax planning' because the factors resulting in this tax planning (-0.25%) are disclosed by the company in this reconciliation. The actual tax paid by GSK Ltd as reported in their consolidated cash flow statement was £2.062m (giving the cash ETR of 19.6%), which is less than the tax expense of £2.154m (ETR = 20.5%). This difference between ETR and Cash ETR given 'undisclosed tax planning' i.e. $20.5\% - 19.6\% = 0.9\%$. The total tax planning can be calculated as STR – Cash ETR ($20.25\% - 19.6\% = 0.65\%$) i.e. GSK Ltd saved tax of £69m (£2.131 - £2,062), which is 0.65% of its profit before tax.

Appendix B: Measurements of Variables

The first column provides the variable name and the second column indicates short names as used within tables and equations. The third column explains how each variable is calculated and the final column provides quick references for research where these variables are used.

Measurement of variables				
Variables	Used as	Measured as	Used in the literature	
Total tax planning	(TP_TOTAL)	Statutory Tax Rate (STR) – Cash Effective Tax Rate (ETR)	Desai and Dharmapala (2006); Dyreng et al. (2010); Armstrong et al. (2015)	
Disclosed tax planning	(TP_DISC)	STR – Effective Tax Rate (ETR)	Holland 1998); Minick and Noga 2010); Abdul Wahab and Holland 2012);	
Undisclosed tax planning	(TP_UNDIS)	ETR – Cash ETR		
International orientation	(MULTI_LIST)	Foreign stock exchange listings		
Risk	(VOLATILITY)	Share returns volatility	Guenther et al. (2017);	
Free cash flows	(FREE_CASH)	Operating cashflows minus capital expenditures	Kraft (2014); Koester et al. (2017)	
Growth	(MTOBOOK)	Market to book ratio	Chen et al. (2010); Kraft (2014)	
Tobin's Q+1	(TOBINS Q+1)	(Total Assets – Total Equity + Market Cap+3)/Total Assets	Desai and Dharmapala (2006); Minick and Noga (2010); Abdul Wahab and Holland 2012); Armstrong et al. (2015); Zimmerman (1983); Mills et al. (1998); Henlon et al. (2007); Dyreng et al. (2008); Kraft (2014)	
Size	(TA)	Natural log of total assets	Gupta and Newberry (1997); Noor et al. (2010); Minick and Noga (2010); Kraft (2014); Armstrong et al. (2015)	
Profitability	(PBT)	ROA = Profit before tax/total assets	Graham (1998); Plesko (2003); Richardson and Lanis (2007); Noor et al. (2010); Kraft (2014)	
Capital structure	(LEV)	Total debt/total assets	Gupta and Newberry (1997); Richardson and Lanis (2007); Noor et al. (2010); Kraft (2014)	
Capital intensity	(CAP_INT)	Tangible assets/total assets	Gupta and Newberry (1997); Kraft (2014)	
R&D intensity	(R&D_INT)	R&D expenditure/total assets	Gupta and Newberry (1997); Kraft (2014)	
Inventory intensity	(INV_INT)	Closing inventory/total assets	Gupta and Newberry (1997); Kraft (2014)	
Governance Score	(GOV_SCO)	Collected from Datastream		

The following variables are manually calculated from the income tax reconciliation disclosed by firms as per IAS12 in the 'notes' section of financial statements. The reconciliation explains the difference between STR applicable on a firm's profit before tax and its reported ETR.

Permanent differences	(PD)	Tax expense/(credit) due to any permanent differences between tax and accounting rules as reported in the reconciliation.	Abdul Wahab and Holland (2012)
Loss relief	(LR)	Tax saved due to loss relief applied by a firm due to losses reported in previous years.	Abdul Wahab and Holland (2012)
Overseas tax difference	(OSTD)	Tax expense/(credit) due to higher/(lower) overseas tax rates.	Abdul Wahab and Holland (2012)
Research credits	(RC)	Tax saved due to research credits received.	Abdul Wahab and Holland (2012)
Prior year tax adjustments	(PYTADJ)	Additional tax expense/(credit) due to any adjustments made in items related to previous years.	
Deferred tax adjustments	(DTADJ)	Additional tax expense/(credit) due to any adjustments made in deferred tax items already reported previously.	
Uncategorised differences	(UNC)	Tax expense/(credit) reported as 'other items' in the income tax reconciliation.	Abdul Wahab and Holland (2012)