School of Accounting, Economics and Finance

Three Essays on Income Shifting, Governance and Accounting Outcomes: Evidence from U.S. Multinational Corporations

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Declaration

To the best of my knowledge this thesis contains no material previously published by any other person except where due acknowledgment has been made.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

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Fatmah Alghamdi

16th November 2022

Abstract

This thesis is comprised of three essays. The first examines the relationship between income-shifting incentives and share repurchases. The second essay examines the association of income shifting and financial restatements. The third essay then investigates non-arm's-length transactions, the existence of offshore financial centres, existence of a transfer pricing agreement and corporate cash holdings in US multinational corporations (MNCs, hereafter). As the world economy has become more integrated, there has been an increase in the number of multinational firms. As of 2017, about half of the publicly traded firms in the US are multinationals. The main goal of MNCs is to maximize global income by minimizing taxes of affiliates that have low or zero taxes, and exploiting differences between the tax rules of different countries.

Chapter 1 of this thesis presents the introduction and includes the objectives of this research. This chapter also details the motivation and contribution of the research and the structure of the thesis. The **second chapter** presents the first essay titled "The effect of income-shifting incentives on share repurchases: evidence from US multinational corporations". This essay examines the relationship between income-shifting incentives and share repurchases of a large sample of US MNCs over the period of 2006–2021. It finds that income shifting is significantly negatively associated with share repurchases. This essay also finds two channels that moderate the relationship between income-shifting incentives and share repurchases, namely, the tax cost of repatriating earnings and the occurrence of an advance pricing agreement. Findings suggest that the association between income shifting and share repurchases further increased in firms with a high tax cost of repatriating earnings. US MNCs with advance pricing agreements have a positive association with share repurchases, which indicates that stronger regulations such as the Tax Cut Job Act (TCJA, hereafter) and advanced pricing agreement (APA, hereafter) reduces repatriation risk and trapped cash risk. The results

are robust to additional tests across a series of endogeneity models including propensity score matching (PSM), and a difference-in-difference (DID) design.

The **third chapter** of this thesis is titled "Income-shifting incentives and financial restatement: evidence from US firms". This chapter examines the relationship between income shifting and financial restatements of a large sample of US firms over the period of 2006–2019. It finds a positive and significant association between income shifting and the occurrence of restatements. This study also finds that the existence of tax havens, research and development expenditure and accruals quality moderate the positive association between income shifting and restatements. Overall, the results suggest that income shifting has important consequences for the likelihood of occurrence of financial restatements. Accruals' quality assist corporations to reduce the risks relating to income shifting. Further, these results are robust using generalized method of moments (GMM) and in models that employ additional control variables.

The **fourth chapter** of this thesis is titled "Non-arm's-length transactions, offshore financial centres, transfer pricing agreements and corporate cash holdings: evidence from US multinational corporations". It examines the association between non-arm's-length transactions, the existence of offshore financial centres, the existence of a transfer pricing agreement and corporate cash holdings for a large sample of US multinational corporations over the 2006–2020 period. This study provides evidence that the existence of non-arm's-length transaction and of offshore financial centres increased the level of corporate cash holdings. In contrast, the existence of a transfer pricing agreement reduces the level of firm cash holdings. Overall, these results suggest that development of transfer pricing agreements with taxing authorities reduces multinational corporations' incentives and capacity to shift profits from higher- to lower-tax countries. These results remain robust to alternative specifications of cash holdings and endogeneity tests. Finally, **the fifth chapter** provides a summary of the findings and outlines directions for future research.

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Dedication

I dedicate this effort to soul of my father, my caring mother, to my love husband, lovely daughter and my brothers and sisters.

Table of Contents

Declaration ii
Abstract iii
Acknowledgements v
Dedication vi
Table of Contents vii
List of Tables x
List of Abbreviations xi
Chapter One Introduction xii
1.1 Introduction 14
1.2 Background and Motivation 14
1.3 Summary of the Findings 18
1.4 Contribution of this thesis 21
1.5Structure of the thesis 24
Chapter Two The Effect of Income Shifting Incentives on Share Repurchases: Evidence from U.S. Multinational Corporations 26
2.1 Introduction 27
2.2 Background 29
2.2.1 The U.S. Tax System 29
2.3 Literature Review and Hypotheses Development 32
2.3.1. Income shifting 32
2.3.2. Share repurchases 33
2.4 Research Design 40
2.4.1 Sample and data 40
2.4.2 Variable description 40
2.4.2.1 Dependent Variables 40
2.4.2.2 Independent variable 41
2.4.2.3 Control variables 41
2.4.3 Model specifications 42
2.5 Empirical Results and Discussion 43
2.5.1 Descriptive statistics 43
2.5.2 Correlation analysis 44
2.5.3 Regression results 46
2.5.3.1 The association between income shifting incentives and share repurchases 46
2.6 Endogeneity tests 47

2.6.1 Propensity score matching (PSM) analysis 47
2.6.2 Difference-in difference procedure 50
2.6.3Additional analyses 52
2.6.3.1 Tax Cost of Repatriating Earnings 52
2.6.3.2 Advance Pricing Agreement (APA) 54
2.7 Conclusion 56
Chapter Three Income shifting incentives and financial restatement: Evidence from U.S 57
3.1 Introduction 58
3.2 Prior literature and hypothesis development 61
3.2.1. Financial restatements 61
3.2.2. Income shifting 62
3.2.2.1. Tax savings associated with income shifting 63
3.2.2.2 Potential risks associated with income shifting 64
3.2.3.1. The moderating effect of tax haven 67
3.2.3.2. The moderating effect of research and development 68
3.2.3.3. The moderating effect of accruals quality 69
3.3 Methodology and research design 70
3.3.1 Sample selection 70
3.3.2 Variable description 71
3.3.2.1 Dependent variable 71
3.3.2.2. Independent variable 71
3.3.2.3. Moderation variables 72
3.3.2.4. Control variables 72
3.3.3 Regression model 73
3.3.3.4 Subsample analysis 74
3.4 Empirical results 75
3.4.1 Summary statistics 75
3.4.2 Regression results 78
3.4.3 Moderation results 80
3.4.3.1 The moderating effect of tax haven –H2. 80
3.4.3.2 The moderating effect of research and development -H3 82
3.4.3.3 The moderating effect of accruals quality - H4 83
3.5 Additional analysis 84
3.5.1. Additional control variables 84
3.6. Endogeneity test: Generalized method of moments (GMM) estimator 86
3.7. Conclusion 88
Chapter Four Non-arm's length transactions, offshore financial centres, transfer pricing agreements and corporate cash holdings: Evidence from U.S. multinational corporations 89
4.1 Introduction 90

4.2 Background 93
4.2.1 The U.S. Tax System 93
4.3 Literature review and hypothesis development 95
4.3.1. Transfer pricing 95
4.3.2. Non-arm's length transaction 96
4.3.3. Offshore financial centres 98
4.3.4. Advance pricing agreements (APA) 100
4.3.5. Corporate cash holdings 101
4.4 Methodology and research design 109
4.4.1. Sample selection 109
4.4.2. Measurements of variables 109
4.4.2.1 Dependent variable 109
4.4.2.2. Independent variables 110
4.4.2.3. Control variables 110
4.4.3Model specifications 110
4.5 Empirical results 112
4.5.1 Regression results 115
4.5.1.1. The association between non-arm's length transaction and corporate cash holdings 115
4.5.1.2. The association between offshore financial centres and corporate cash holdings 116
4.5.1.3. The association between transfer pricing agreement and corporate cash holdings 119
4.6 Endogeneity tests 121
4.6.1 Propensity score matching (PSM) analysis 121
4.6.2 Difference-in difference procedure 123
4.7 Conclusion 124
Chapter Five Conclusion 126
5.1 Introduction 127
5.2 Summary of Major Findings 127
5.3 Directions for Future Research 128
References 130
Appendices 142

List of Tables

Table 1-1 Summary of the Findings 19
Table 2-1 Sample selection 40
Table 2-2 Descriptive Statistics 44
Table 2-3 Pearson Correlation Matrix 45
Table 2-4 Effect of income shifting on share repurchases (H1) 47
Table 2-5 Propensity score matching (PSM) analysis – Endogeneity tests 48
Table 2-6 Difference-in-difference (DID) test – Endogeneity tests 51
Table 2-7 Interaction effect of income shifting with Tax Cost of Repatriating Earnings on share repurchases 52
Table 2-8 Interaction effect of income shifting with the Advance Pricing Agreement (APA) on share repurchases 55
Table 3-1 Sample Specifications 71
Table 3-2 Descriptive Statistics 75
Table 3-3 Pearson Correlation Matrix 77
Table 3-4 Regression Results: Association between Income Shifting and Financial Restatement (H1) 79
Table 3-5 Regression Results – Subsample Analysis of tax haven (THAV) 81
Table 3-6 Regression Results – Subsample Analysis of research and development (R&D) 82
Table 3-7 Regression Results – Subsample Analysis of accruals quality (AQ) 83
Table 3-8 Regression Results – Additional control variables 85
Table 3-9 GMM Regression Results 87
Table 4-1 Sample Specifications 109
Table 4-2 Descriptive Statistics 113
Table 4-3 Pearson Correlation Matrix 114
Table 4-4 Non-arm's length transaction and corporate cash holdings (H1) 116
Table 4-5 International financial centres and corporate cash holdings (H2) 118
Table 4-6 Transfer pricing agreement and corporate cash holdings (H3) 120
Table 4-7 Propensity score matching (PSM) analysis 122
Table 4-8 Difference-in-difference (DID) test 124

List of Abbreviations

MNCs	Multinational corporations
TCJA	Tax Cut Job Act
AJCA	American Jobs Creation Act
APA	Advanced Pricing Agreement
FIN 48	Accounting for Uncertainty in Income Taxes
OLS	Ordinary Least Squares
SIC	Standard Industrial Classification
GMM	Generalised Method of Moments Estimation
PSM	Propensity Score Matching
SEC	Securities and Exchange Commission
U.S.	The United States of America
DID	Difference-in-difference test
IRS	Internal Revenue Service
CIT	Corporate income tax
GILTI	Global intangible low-taxed income
BEPS	Base Erosion and Profit Shifting
GAAP	Generally Accepted Accounting Principles
UFE	Unremitted foreign earnings
OFCs	Offshore financial centres
TPG	Transfer pricing guidelines
OECD	Organization for Economic Cooperation and Development
IAS 24	Related Party Disclosures
FDII	Foreign-derived intangible income
TJN	Tax Justice Network
G20	Group of Twenty is an intergovernmental forum comprising 19 countries and the European Union (EU).

Chapter One

Introduction

1.1 Introduction. 14
1.2 Background and Motivation 14
1.3 Summary of the Findings 18
1.4 Contribution of this thesis 21
1.5 Structure of the thesis 24

1.1 Introduction

The main purpose of this chapter is to provide the relevant background about US multinational corporations (MNCs). This chapter highlights specific characteristics of the US MNCs and US tax system and motivations behind this thesis. This chapter also provides a summary of the findings of the three essays. Moreover, this chapter highlights the contribution of the three essays to the income-shifting literature and finishes with an outline of the structure of the thesis.

1.2 Background and Motivation

Globalization has created many multinational companies, which are characterized by the establishment of branches and subsidiaries in various countries but managed from the home country, for example, Nike, Coca-Cola and BMW (Leitch and Barrett 1992). MNCs have been operating since the initiation of overseas trade (Helpman 1984). Today, the main actors in foreign economic activity and the main force in the process of economic integration in the world are multinational corporations. They have acquired the status of the most important players in the modern world economy and the international division of labour. As the world economy has become more integrated, there has been an increase in the number of multinational firms. As of 2017, about half of the publicly traded firms in the United States are multinational. For the average multinational firm, foreign income (sales) represents about 40% of aggregate income (sales), proving that MNCs are significant players in the world economy.

The main goal of MNCs is to maximize global income by minimizing taxes to affiliated companies that have low or zero taxes and exploiting differences between the tax rules of different countries, and by taking advantage of tax subsidy agreements with host countries (Leitch and Barrett 1992). As a result, MNCs hold significant amounts of cash in their foreign subsidiaries. The US MNCs currently hold over $2 trillion in cash, with the majority of this

amount held by foreign subsidiaries (Casselman & Lahart, 2011; Davidoff, 2011). One oft-suspected reason for this offshore cash is the US tax treatment of foreign-sourced earnings. The US tax rules are such that the operating earnings of foreign subsidiaries are generally not subject to the United States tax until the related cash is repatriated to the country.

Furthermore, according to Garcia-Bernardo and Janský (2022), MNCs shifted $1 trillion of profits to tax havens in 2016, which in turn implies $200–300 billion in revenue losses for other countries. The total estimates of profit shifting are broadly comparable to existing estimates, such as Tørsløv et al. (2020), who estimated the profit shifting to be $616 billion in 2015. Therefore, profit shifting by MNCs has cost the US government considerable revenue in recent years.

However, on December 20, 2017, Congress passed what is commonly known as the Tax Cuts and Jobs Act (TCJA). The TCJA is the most comprehensive tax reform since 1986. The reform lowers the federal corporate income tax rate from 35% to 21% and was designed to stimulate the economy through supply-side incentives. Additionally, the TCJA established a territorial system of eliminating taxes on repatriation of actively earned profits by foreign subsidiaries to United States parent companies, protecting the integrity of the territorial system, reducing profit shifting, and encouraging companies to locate profit centres and real activity within the US. Furthermore, as a result of the TCJA, the corporate tax rate has been lowered, which will reduce the incentives to shift profits away from the US, which will have the effect of increasing corporate cash holdings. Moreover, in the first quarter of 2018, the TCJA did result in a major increase in repatriated funds. Gravelle and Marples (2019) indicated that much of the repatriated funds financed stock repurchases. As Hemel and Polsky (2019) demonstrated, the increase in repurchases prevented firms from paying dividends and thus avoiding taxes. Comparing 2018 and 2019 to 2010–2017, real repatriated funds increased by $470

billion. Approximately 60 per cent of the increase in repatriated funds came from stock buy-backs, which increased by $282 billion per year relative to the 2016–17 average.

Therefore, is new reform affecting profit-shifting incentives? And if so, did the corporate cash holdings increase? Does this affect share buy-backs? As the debate over an international agreement on a minimum corporate tax continues (OECD, 2021), these questions are crucial. Hence, the second chapter of this thesis addresses issues that are both current and important regarding the association between income shifting and share repurchases.

Income shifting activities can be used as a smokescreen to mask managers' diversionary tactics. Due to this information risk, it is possible that the earnings figures disclosed by companies are not reliable. De Simone, Mills, and Stomberg (2019) argue that the MNC's capacity to undertake complex income shifting could produce significant economic uncertainty and exposure to tax risks and volatility in future earnings. These costs could, potentially, increase the firm's probability of restatement. Moreover, tax haven countries are known for their legally mandated secrecy laws and for their lack of informational exchange with regulators and tax authorities from other countries (Leikvang 2012). Secrecy rules may increasemanagers' capacity to conceal complicated tax avoidance strategies from shareholders (Black,Dikolli and Dyreng 2014; Leikvang 2012) while regulators and tax authorities may be less ableto supervise management behaviour due to a lack of information exchange (Desai, Dyck and Zingales 2007). Thereby, managers may make mistakes if accounting complexity is high, which leads to an increase in the possibility of unintentional misstatement or increase in manipulation by management, and the increase in inherent risks increases the probability of restatement.

From the mid-1990s to the early 2000s, financial and tax reporting aggressiveness increased. Over this period, numerous companies were investigated and prosecuted for tax shelter fraud and for fraudulent accounting practices (Frank, Lynch and Rego 2009). For

instance, the complexity created by tax sheltering was used by Tyco International to mask their rent extraction behaviour (Desai 2005). According to Lennox, Lisowsky, and Pittman (2013), firms restating earnings has increased significantly in the last two decades. As a consequence of the upward trend in restatement, the average effective tax rate for corporations in the US has significantly declined (Dyreng et al. 2017). Consequently, the third chapter in this thesis investigates the effects of MNCs's level of income shifting and the likelihood of financial restatements.

Global tax authorities have raised concern about the loss of tax revenues that may be the result of abusive transfer pricing (Publishing, Co-operation and Development 2012). The US firms hold a large amount of cash compared to their assets, but MNCs report a much higher cash balance than purely domestic firms due to precautionary measures to cover transaction costs (Bates, Kahle and Stulz 2009; Han and Qiu 2007; Mulligan 1997; Opler et al. 1999; Ozkan and Ozkan 2004). One oft-suspected reason for this offshore cash is the US tax treatment of foreign-sourced earnings. However, in recent years, tax authorities around the world have revised their policies regarding transfer pricing, introducing new penalties, imposing new documentation requirements, expanding information exchange, strengthening audit staff training and increasing audit and inspection activities (De Mooij and Liu 2020).

In 2004, the United States Congress enacted the American Jobs Creation Act (AJCA), which reduced the tax cost to repatriate foreign earnings for the US MNCs and provides an effective exogenous setting for examining tax-induced behaviour in the United States (Blouin and Krull 2009; Chen 2014; Clemons and Kinney 2009; Faulkender and Petersen 2012; Graham, Hanlon and Shevlin 2010). The MNCs have turned to an advance pricing agreement (APA) to reduce their tax risk (Markham 2012). This agreement is a formal agreement between a tax authority and the MNCs, in which the parties agree on how the MNCs will conduct their

transfer pricing, to estimate its taxable income and to pay taxes for a fixed period, which reduces the likelihood of a discrepancy in income taxes (Eden 2015; Markham 2012).

While previous studies assert that transferring prices is used as a mechanism to shift income out of the US, direct evidence on the role of transfer pricing agreement remains controversial (Firmansyah and Yunidar 2020; Richardson, Taylor and Lanis 2013; Taylor, Richardson and Lanis 2015; Wahyudi, Sutrisno and Rusydi 2021; Waworuntu and Hadisaputra 2016). Therefore, the main objective of Chapter 4 in this thesis is to examine the association between transfer pricing and corporate cash holdings of a sample of the US MNCs.

1.3 Objectives of the study

This thesis addresses the following three objectives using evidence obtained from the US firms.

- To examine the association between income- shifting incentives and share repurchases.
- To examine the association between income -shifting incentives and financial restatement.
- To examine the association between Non-arm's-length transactions, offshore financial centres, transfer pricing agreements and corporate cash holdings.

1.4 Research Methodology

This thesis adopted quantitative research approach because the aim of the research is to critically investigate the relationship among dependent variables and independent variables, thus the quantitative research approach is appropriate method. This thesis is based on assumption that there is an association between income shifting and share repurchases, income shifting and the likelihood of financial restatements and the association between transfer pricing and corporate cash holdings of a sample of the US MNCs. Therefore, this research will concentrate on the verification of the above association. Hence, in order to answer the research question in three essays this thesis adopts a positivist approach since it fits with examining the theory by setting a set of research hypotheses. The positivistic nature of the research is characterized by the research objective; to identify

whether there is evidence to support a causal relationship between income shifting and share repurchases, income shifting and the likelihood of financial restatements and the association between transfer pricing and corporate cash holdings of a sample of the US MNCs. (Burrell and Morgan, 1979).

1.5Summary of the Findings

In this thesis, the second chapter presents the findings of the first essay, which examined the the potential effect of income-shifting incentives on share repurchases. Using a large hand-collected sample of firms over the period of 2006–2021, the results indicate a negative association between the income-shifting incentives and share repurchases. Moreover, this study finds that the negative relationship between income shifting and share repurchases is further increased in firms with high tax costs of repatriating earnings, while, US MNCs with advance pricing agreement have a positive association with share repurchases.

The third chapter of this thesis investigates whether income shifting by US multinational corporations is associated with the likelihood of financial restatements. It also examines whether the existence of tax havens, level of research and development and accruals quality moderate the association between income shifting and the likelihood of restatements. A large sample of US MNCs over the period of 2006–2019 is used. This study finds a positive and significant association between income shifting and restatement. It also finds that the existence of tax havens, research and development and accruals quality moderate the positive association between income shifting and restatements. Further, these results are robust using GMM and in models that employ additional control variables.

The fourth chapter of this thesis examines the association between non-arm's-length transactions, the existence of offshore financial centres, the existence of a transfer pricing agreement and corporate cash holdings for a large sample of US multinational corporations over the 2006–2020 period. This study provides evidence that the existence of non-arm's-length transaction and of offshore financial centres increase the level of corporate cash holdings. In contrast, the existence of a transfer pricing agreement reduces the level of firm cash holdings. These results are robust across a series of endogeneity and selection bias tests including propensity score matching (PSM) and difference-in-difference (DID).

Table 1.1 Summary of the Findings

Chapter	Essay	Hypothesis	Findings
2	One	***H1:*** *There is a negative association between income shifting and share repurchases.*	Income shifting is significantly negatively associated with share repurchases.
		H2: *The negative relationship between income shifting and share repurchases is increased in firms with high levels of tax cost of repatriating earnings.*	The negative relationship between income shifting and share repurchases is further increased in firms with high tax costs of repatriating earnings.
		H3: *There is a positive relationship between* income shifting *and* share repurchases *with the advance pricing agreement (APA).*	US MNCs with advance pricing agreement have a positive association with share repurchases.

3	Two	***H1:*** *There is a positive association between an MNC's level of income shifting and the likelihood of financial restatements.*	There is a positive and significant association between income shifting and financial restatement.
		H2a: *Tax haven use moderates the relationship between income shifting and the likelihood of financial restatements.*	Firms that engage in income shifting activates via a tax havens will lead to more financial restatement.
		H2b: *The level of research and development moderates the relationship between income shifting and the likelihood of financial restatements.*	I find that the positive and significant association between income shifting and restatement is moderated with research and development.
		H2c: *Accruals quality (AQ) moderates the relationship between income shifting and the likelihood of financial restatements.*	I find that the positive and significant association between income shifting and restatement across all of the regression models for the low AQ subsample, but it is not significant in the high AQ subsample, which means the better accruals quality firms have, the less financial restatement.
4	Three	***H1****: There is a positive association between non-arm's-length transaction and corporate cash holdings.*	The existence of non-arm's-length transactions increases the level of corporate cash holdings.
		H2*: There is a positive association between offshore financial centres and the level of firm cash holdings.*	The existence of offshore financial centres increases the level of corporate cash holdings.

		***H3**: There is a negative association between transfer pricing agreement with tax authorities and corporate cash holding.*	The existence of a transfer pricing agreement reduces the level of firm cash holdings.

1.6 Contribution of this Thesis

The three essays in this thesis contribute to the literature in several ways. The first essay (**in Chapter 2**) to the best of my knowledge, is the first to examine the effect of income shifting on share repurchases both pre- and post-TCJA. Based on the findings of this study, US MNCs that engage in income shifting activities have less share repurchases. In addition, this essay uses unique hand-collected data over the 2006–2021period. With data sources that reach up to 2021, I can capture two or three years post-reform and see the dynamic shift in profit-shifting incentives and actions following the TCJA. Furthermore, the findings of this study provide analysis of the relationship between income shifting and share repurchases by investigating two channels potentially affecting that relationship, namely, tax cost of repatriating earnings and advance pricing agreement. Findings suggest that the association between income shifting and share repurchases further increased in firms with high tax costs of repatriating earnings, while US MNCs with advance pricing agreement have a positive association with share repurchases, which indicate that stronger regulations such as the TCJA[1] and APA[2] reduce repatriation risk and trapped cash risk. This essay is based on agency theory to explain the

[1] Public Law No. 115-97 is commonly called the Tax Cuts and Jobs Act, but the official title is "An Act to Provide for Reconciliation Pursuant to Titles II and V of the Concurrent Resolution on the Budget for Fiscal Year 2018." https://www.irs.gov/newsroom/tax-cuts-and-jobs-act-a-comparison-for-businesses

[2] The APA Advance Pricing Agreement programme provides an alternative dispute resolution mechanism for taxpayers and the IRS to resolve complex international transfer pricing cases. https://www.irs.gov/businesses/corporations/apma

behaviour of managers who engage in income-shifting activities. Finally, the results of this essay should also be of interest to academics and policymakers in considering the potential implications of the recent significant reduction in the US corporate tax rate in response to the TCJA and territorial tax system.

The second essay in **Chapter 3** contributes to the literature in several important ways. First, to the best of my knowledge, this is the first study to empirically examine the association between income shifting and restatement. Previous studies examine the relationship between income shifting and different aspects, such as corporate investment (De Simone, Klassen and Seidman 2019), information asymmetry (Chen et al. 2018), cost of equity capital (Richardson et al. 2021) and firm bankruptcy (Dhawan, Ma and Kim 2020). Nevertheless, there is no research that examines the association between income shifting and restatement. Income shifting is associated with tax haven (Desai, Foley and Hines Jr 2006a), research and development (Barker, Asare and Brickman 2017) and accruals quality (Putri, Rohman and Chariri 2016). All these factors could mediate the relation between income shifting and restatement. Therefor this study investigates the moderation effect of tax haven, research and development and accruals quality on this relationship.

The findings might also provide an additional explanation for why most income shifting happens via tax havens. As tax havens, these countries have laws requiring secret information exchange, not sharing tax information with regulators, tax authorities, or other governments (Leikvang 2012). The possibility of secrecy laws increases managers' ability to hide complex tax avoidance strategies from shareholders (Black, Dikolli and Dyreng 2014; Leikvang 2012) and also regulators and tax authorities may not be able to act as additional monitors of manager behaviour due to poor information exchange (El Ghoul, Guedhami and Pittman 2011). Consequently, MNCs have substantial leeway to take advantage of these countries. Finally, the results of this study should be of interest to regulators in auditing,

financial reporting and taxation. As the proportion of financial statement restatements motivated by tax-related issues continues to increase, I believe that it is important from a policy perspective to mitigate opportunities for income-shifting activities by MNCs and also improve the coherence of international tax rules and ensure the transparency of tax environments across countries and jurisdictions. In addition, a tax-motivated accounting restatement can alert regulators and the Internal Revenue Service (IRS) of potential deficiencies associated with a corporation's aggressive financial reporting related to the corporation's income tax liability. In addition, this study is also useful for shareholders and investors. Given that income shifting increases restatement, shareholders and investors can view abnormalities in a firm's income-shifting activities as potential red flags and can demand additional risk premiums from firms engaging in income shifting.

The third essay in **Chapter 4** contributes to the literature in a number of ways. First, to the best of my knowledge, this study is original in examining the association between transfer pricing and corporate cash holdings. Past research has focused more on transfer pricing aggressiveness and corporate tax avoidance (Firmansyah and Yunidar 2020; Richardson, Taylor and Lanis 2013; Taylor, Richardson and Lanis 2015; Wahyudi, Sutrisno and Rusydi 2021; Waworuntu and Hadisaputra 2016). This study, however, contributes to a new and growing field of research examining the effects of transfer pricing agreements on the level of firm cash holdings. It also extends prior literature centred on the enforcement of transfer pricing regulations by providing insights on the effects of transfer pricing agreements when deterring profit-shifting behaviour through transfer price manipulation by MNCs.

Second, this study uses unique hand-collected data on firms' transfer pricing agreements with tax authorities over the 2006–2020 period. It documents a positive association between non-arm's-length transactions and corporate cash holdings, indicating transfer pricing manipulation is the primary means by which corporations try to maximize global profits and

to minimize taxes. In addition, this study finds the existence of offshore financial centres increases corporate cash holdings, suggesting offshore financial centres provide the facility to shift more income out of the US. Moreover, this study empirically evaluates and finds transfer pricing agreement negatively impacts corporate cash holdings, implying that transfer pricing agreements with tax authorities are important to mitigate the negative effects of transfer pricing aggressiveness.

Third, the findings on the relationship between transfer pricing and cash holdings are particularly interesting to investors because cash expropriation has a devastating impact on shareholder wealth. A transfer pricing agreement has the potential to bring real economic benefits to corporations, serving as an efficient mechanism that limits the adverse effects of transfer pricing aggressiveness and creates investment opportunities for corporations.

Fourth, this study also contributes to the literature by informing the broader policy about crucial reforms to the US tax system by extending the knowledge of how APAs and theTCJA affect repatriation behaviour and corporate cash holdings. This study finds a negative and significant association between transfer pricing agreements with tax authorities andcorporate cash holdings, which indicates that stronger regulations such as APAs and the TCJAwill reduce repatriation risk, trapped cash risk and litigation risk. Finally, the results of this study should also be of interest to academics and policymakers in considering the potential implications of the recent significant reduction in the US corporate tax rate in response to the TCJA and territorial tax system. Moreover, the findings of this study may inform governmentsto adopt more strict regulations in order to mitigate adverse effects of transfer pricing aggressiveness.

1.7 Structure of the Thesis

This thesis is organized into five chapters and contains three essays. Chapter 1 documents the background and motivation for the study, presents a summary of the finding and the contribution of the three essays,

and ends with the organization of chapters. Chapter 2 presents the first essay entitled "The effect of income-shifting incentives on share repurchases: evidence from US multinational corporation". Chapter 3 presents the second essay entitled "Income-shifting incentives and financial restatement: evidence from US firms". Chapter 4 presents the third essay entitled "Non-arm's-length transaction, offshore financial centers, transfer pricing agreement and corporate cash holding: evidence from US multinational corporation". Chapter 5 concludes the thesis, presenting the results of the research, the policy implications and directions for future research.

Chapter Two

The Effect of Income Shifting Incentives on Share Repurchases: Evidence from U.S. Multinational Corporations

2.1 Introduction..... 27
2.2 Background. 29
2.3 Literature Review and Hypotheses Development..... 32
2.4 Research Design..... 40
2.5 Empirical Results and Discussion..... 43
2.6 Endogeneity tests 47
2.7 Conclusion 56

2.1 Introduction

Multinational corporations operate in multiple countries with different tax rates, and relocation of income to lower-tax countries can reduce global taxes for such firms. Overall, MNCs allocate a large proportion of their foreign income to low-tax jurisdictions (Clausing 2020b; Guvenen et al. 2022). According to Levin (2012), MNCs have accumulated approximately $1.7 trillion in earnings offshore as a result of this preferential income reallocation. Therefore, profit shifting by MNCs has cost the US government considerable revenue in recent years.

On December 20, 2017, the US Congress passed what is commonly known as the *Tax Cuts and Jobs Act* (TCJA). The TCJA is the most comprehensive tax reform since 1986 in the US. The reform lowered the federal corporate income tax rate from 35% to 21% and it was designed to stimulate the economy through supply-side incentives. Additionally, the TCJA established a territorial system of eliminating taxes on repatriation of actively earned profits by foreign subsidiaries to US parent companies, protecting the integrity of the territorial system, reducing profit shifting, and encouraging companies to locate profit centres and real activity within the US.

As a result of the TCJA, the reduction in the corporate tax rate may reduce the incentives to shift profits away from the US. This may in turn have the effect of increasing corporate cash holdings. Moreover, in the first quarter of 2018, the TCJA did result in a majorincrease in repatriated funds to the US. Gravelle and Marples (2019) indicate that much of therepatriated funds financed stock repurchases. As Hemel and Polsky (2019) demonstrate, the increase in repurchases prevented firms from paying dividends and thus avoiding taxes. Whencomparing 2018 and 2019 to 2010–2017, real repatriated funds increased by $470 billion. Approximately 60 per cent of the increase in repatriated funds came from stock buy-backs, which increased by $282 billion per year compared to the 2016–2017 average.

Did the TCJA affect profit-shifting incentives? And if so, did the corporate cash holdings increase? Does this affect share buy-backs? As the debate over an international agreement on a minimum corporate tax continues (OECD, 2021), these questions are crucial. While several papers have studied income shifting across different perspectives, to the best of my knowledge none have investigated the association between income shifting and share repurchases. Hence, this essay addresses issues that are both current and important.

Using a large hand-collected sample of firms over the period of 2006–2021, I find a negative and significant association between income-shifting incentives and share repurchases. Moreover, this study finds that the negative association between income-shifting incentives and share repurchases is significantly increased in firms with a high tax cost of repatriating earnings. Existence of an advance pricing agreement (APA) moderates the association between income-shifting incentives and share repurchases. The result confirms that stricter regulations will be effective in curbing the extent of profit-shifting activities, which increases corporate cash holdings and share repurchases.

This study contributes to the literature in several important ways. First, to the best of my knowledge, this study is the first to examine the effect of income shifting on share repurchases both pre- and post- the TCJA. Second, a unique hand-collected data set is utilized over the 2006–2021 period. I am able to assess the dynamic shift in profit-shifting incentives and actions following the TCJA. Third, this essay also contributes to the literature by informing broader policy about crucial reforms to the US tax system by extending the knowledge of how the TCJA affects profit-shifting incentives. This essay finds a negative and significant association between profit-shifting incentives and share buy-backs. Furthermore, the findings of this study provide analysis of the relationship between income shifting and share repurchases by investigating two channels potentially affecting that relationship namely, tax cost of repatriating earnings and advance pricing agreement. Findings suggest that the association

between income shifting and share repurchases further increased in firms with a high tax cost of repatriating earnings. US MNCs with an advance pricing agreement have a positive association with share repurchases, which indicates that stronger regulations such as the TCJA and APA reduce repatriation risk and trapped cash risk and increase share repurchases.

Finally, the results of this essay should also be of interest to academics and policymakers in considering the potential implications of the recent significant reduction in the US corporate tax rate in response to the TCJA and territorial tax system. Moreover, the findings of this essay may inform governments to adopt strict regulations in order to mitigate adverse effects of profit shifting.

The remainder of this chapter is organized as follows. Section 2 discusses the background of the US tax system. Section 3 provides the literature review and develops the hypotheses. Section 4 describes the research design and variable measurement. The results are discussed in Section 5, and Section 6 presents endogeneity tests and additional analyses. Finally, Section 7 concludes the chapter.

2.2 Background

2.2.1 The US Tax System

After President Reagan's major reform of 1986, the US corporation tax system remained unchanged. At the time of its introduction in 1909, the corporate income tax (CIT) rate in the United States was just 1%, but it increased steadily to more than 10% per cen by the 1920s and to more than 40% by the 1940s. In 1968, the corporate tax rate peaked at 52.8% and decreased slightly in the 1970s (Heinemann et al. 2018). The US tax system became one of the most attractive in the world after the 1986 major tax reform reduced corporate tax rates from 46% to 34%. The US tax system remained almost unchanged in the following years, with the exception of an increase in effective tax rates. As a result, the US corporate tax code became aunique system (Heinemann et al. 2018).

In 2004, US congress enacted the American Jobs Creation Act (AJCA) a temporary tax holiday, which allowed MNCs an 85% dividends-received deduction for the repatriation of earnings from foreign subsidiaries to the US parent company during one of the allowable years of 2004, 2005 or 2006. Under the AJCA, a corporation taxed at a 35% rate for the repatriated foreign earnings would only be taxed at 5.25% (Blouin and Krull 2009). This tax holiday was designed to stimulate the US economy by encouraging firms to repatriate their earnings that would otherwise be kept abroad, so they can invest them domestically (Dong et al. 2019b).

In addition, corporate tax rates in the US are among the highest in the developed world. This, combined with a worldwide tax system, caused calls for corporate tax reform (Dyreng et al. 2020). As evidence that the US tax system drove corporate activity abroad, critics cited an increase in unremitted foreign earnings as evidence of the competitiveness of the US corporate tax system (Hanlon, Hoopes and Slemrod 2019). As a result of rising calls for tax reform and Republican control of the White House and Congress, the Tax Cut and Jobs Act (TCJA) was passed in 2017 – which is known as tax reform. The TCJA of 2017 is the largest US tax law change in three decades and led to the most significant changes in tax policy since the Tax Reform Act of 1986 (Auerbach 2018; Dyreng et al. 2020).

Before the TCJA, the United States had a worldwide tax system that deferred taxes, sometimes called a credit system. This system operated such that foreign earnings were taxable in the United States, and a foreign tax credit was allowed for foreign taxes paid, or deemed to be paid, on the foreign earnings. However, in the case of active operating earnings of foreign subsidiaries, the foreign earnings are not taxable in the United States immediately; rather, the US tax due on those earnings is deferred until the earnings are repatriated (returned to the parent corporation as dividends) (Hanlon, Hoopes and Slemrod 2019). As a result, many companies retained foreign earnings in their foreign subsidiaries to avoid paying the relatively high US tax upon repatriation. Under this system, deferral was a powerful incentive to shift profits to

offshore tax havens, where they might incur less tax and receive better treatment once they are repatriated (Foley et al. 2007).

In contrast, under the TCJA, some foreign earnings are immediately taxable in the United States as part of global intangible low-taxed income (GILTI), but most are exempt from US taxation. Additionally, a major purpose of the TCJA, as evidenced by the Council of Economic Advisers (2017, 2018), was to encourage businesses to locate more of their real activity and profits in the United States. In order to achieve this goal, the TCJA reduced the corporate tax rate from 35 to 21 per cent, created a territorial system (with deemed repatriation of previously accumulated but unrepatriated foreign profits) and three new international provisions (GILTI, FDII, and BEAT) (Clausing 2020b). A GILTI inclusion is introduced under the TCJA in order to discourage income shifting between and among foreign jurisdictions. The GILTI inclusion encourages intangible foreign assets investment, whereas the FDII deduction discourages tangible domestic assets investment (Dharmapala 2018).

There are two main reasons why corporate tax reform in the US was deemed to be needed. First, the US has for several years been the country with the highest statutory tax rate among developed countries (Slemrod 2018). Second, because it was a territorial tax system, often referred to as an exemption system, which means income earned outside the home country is exempt from home country taxation. This system was adopted in almost every developed economy except the US (Hanlon, Lester and Verdi 2015). Moreover, various politicians from both sides of the political aisle have argued that modifying the corporate tax system will improve US corporations' competitive position worldwide (Dyreng et al. 2020). Following the TCJA enactment, the stock market generally reacted positively, indicating that market participants expected significant tax savings for corporations under the new law (Wagner, Zeckhauser and Ziegler 2018).

2.3 Prior literature and hypothesis development

2.3.1. Income Shifting

Income shifting is described as the process of transferring income from one legal jurisdiction to another. Firms might pass income between states and provinces or between countries (Klassen and Shackelford 1998). This study focuses on the income shifting of US MNCs because a large number of such firms engage in income shifting. Recent literature provides evidence that MNCs in the US are engaged in specific activities designed to transfer revenue to low-tax jurisdictions (Klassen and Laplante 2012).

Previous research indicates that income shifting is tax-motivated (De Simone, Klassen and Seidman 2018; De Simone, Mills and Stomberg 2019; Demere and Gramlich 2018; Dyreng and Markle 2016; Klassen and Laplante 2012; McGuire, Rane and Weaver 2018). These studies have concluded that the main objective of income shifting is tax minimization. When domestic tax rates are higher than foreign tax rates, multinational firms tend to shift income from the US to foreign countries. Under a worldwide tax system, foreign income was deferred from US taxation, providing substantial incentives for multinational corporations to shift income to tax havens for lower taxes (Clausing 2020b). Profit shifting became a renowned practice among US multinationals, assisted by a permissive regulatory environment (Clausing (2020a).

Clausing (2020b) argues that there was widespread speculation that US MNCs had trillions of dollars of foreign earnings sitting offshore as a result of profit shifting. According to country-by-country data in 2017, earnings offshore totalled $4.4 trillion, $2.8 trillion of which were concentrated in only nine havens (Bermuda, the Caymans, Ireland, Jersey, Luxembourg, Netherlands, Puerto Rico, Singapore, and Switzerland). According to Foley et al. (2007), MNCs kept increasing cash overseas because of the high cost of repatriating foreign

income. Furthermore, this tax-based explanation is confirmed by De Simone, Piotroski, and Tomy (2019). In anticipation of a reduction of repatriation taxes, multinational firms relocated income to the US.

However, with new tax reform, several changes were made that would affect the profit-shifting incentives for MNCs. MNCs booked a majority of their direct investment earnings in just seven countries in 2017, and these seven countries accounted for the vast majority of global profits shifted by US MNCs. Various data sets and methods indicate that profit shifting by US multinational companies reduced corporate tax revenues by large magnitudes by 2017. Clausing (2020a) estimates suggest a revenue loss of approximately $100 billion per year as a result of profit shifting.

Before the TCJA, pharmaceutical and technology companies often had very low effective tax rates, due to the fact that they were able to shift profits outside the country to avoid paying taxes. The TCJA, however, resulted in only small reductions in profit shifting for each type of firm (Gale and Haldeman 2021). In the three most recent years before the TCJA, foreign profits for the 10 largest US pharmaceutical companies were around 78% and barely dipped below 75% by 2019. Gale et al. (2019) argued that although the new tax reform reduced profit-shifting incentives, they did not eliminate them. In other words, the incentives to earn income within the United States have improved, but not, however, to the full extent implied by the statutory rate decrease.

2.3.2. Share Repurchases

Share repurchases, also known as share buy-backs, represent a company's repurchase of its own stock. Repurchase plans, or buy-back plans, are written policies approved by the board of directors (Grullon and Ikenberry 2000). Westphal and Zajac (2001) state that due to external pressure, share repurchases are a growing practice. The early 1980s were the golden age for

the gradual removal of restrictions on open market share purchases; the trend became universal in the 1990s and 2000s. Companies had few opportunities or faced high costs to do so before countries legally allowed open market share repurchasing (Wang, Yin and Yu 2021).

There have been heated debates surrounding share repurchases. A number of studies have shown that a firm's efforts to repurchase its shares may negatively impact capital expenditures and employment growth (Grosman and Amore 2021; Wang, Yin and Yu 2021). Other studies point out that opportunistic managers use share repurchases as a way to increase their firm's share price to mislead investors and manage earnings per share (Chan et al. 2010; Hribar, Jenkins and Johnson 2006). Moreover, Banerjee, Humphery-Jenner, and Nanda (2018) claim that when CEOs become overconfident and entrenched in their positions, they increase share repurchases, which are financed by reducing productive investments, and as their overconfidence increases.

There is evidence that one of the primary reasons share repurchases have become more popular is that they are more flexible than dividends (Jagannathan, Stephens and Weisbach 2000). According to Nohel and Tarhan (1998) dividends are "sticky" payout commitments, so repurchases may be a better way to handle random cash shocks than dividends, so repurchases can alleviate the agency costs of free cash flow. Additionally, share repurchases boost earnings per share by helping to offset the dilutive effects of employee stock options (Bens et al. 2003).

A company may respond to tax reform by repurchasing shares in two ways. First, firms may announce plans to repurchase shares. An authorization to repurchase shares under a new repurchase plan does not mean that securities will be purchased; firms are under no obligation to actually buy as many shares as they are authorized to repurchase. The second way is to repurchase shares through new or existing plans. For instance, due to the TCJA, a firm that is allowed to purchase 50 million shares over two years may decide to repurchase all 50 million

shares in 2018, when it would not have done so without the TCJA (Hanlon, Hoopes and Slemrod 2019).

By reducing corporate taxes and releasing previously "locked-in" foreign cash, the TCJA increased cash flow for many US companies. Firms may make different payout decisions, depending on the source of cash flow motivating the change (Hanlon, Hoopes and Slemrod 2019). If firms anticipate cash tax savings resulting from lower tax rates (or other features of the TCJA), and if they expect those tax savings to be sustainable, they may raise their dividends on a regular basis. As a result of the TCJA, repatriated funds increased markedly at the beginning of 2018, and though they declined slightly later in the year, repatriations remained above their pre-TCJA levels into 2019 (Gravelle and Marples 2019).

According to Gravelle and Marples (2019), much of the repatriated capital funded stock repurchases. As Hemel and Polsky (2019) illustrated, companies avoided taxes by repurchasing shares rather than paying dividends. Compared to 2010–2017, real repatriated funds increased by $470 billion in 2018 and 2019. About 60% of the increase in repatriated funds was due to an increase in stock buy-backs, which amounted to $282 billion per year.

2.3.3 Hypothesis Development

Under a "worldwide" tax system, MNCs have an incentive to retain earnings abroad as a result of profit-shifting activity. Firms with lower average tax rates tend to have higher cashholdings. This could explain why multinational firms hold so much cash overseas. Therefore, under this system, the foreign cash for US firms is potentially not available to distribute to shareholders. Consequently, leaving significant amounts of cash abroad is risky. Cash holdingsoversea may result in it being more likely that managers will use foreign cash to make value- destroying foreign investments (Hanlon, Lester and Verdi 2015), higher levels of abnormal debt, and fewer shareholder payouts (De Simone, Klassen and Seidman 2018; Nessa 2017), and less efficient investment (Amberger, Markle and Samuel 2021).

Corporate cash holdings can be analysed through agency theory, the free cash flow hypothesis, developed by Jensen (1986) and Sultz (1990), which states that firms will squander free cash flow due to the agency problems. That theory also predicts that shareholders limit managers' access to free cash flow so that conflicts of interest between managers and shareholders can be mitigated. Previous literature shows mixed results regarding the free cash flow hypothesis. The free cash flow hypothesis is supported by some studies. For example, Richardson (2006) finds a positive association between firms' free cash flow and overinvestment. Moreover, poorer performing acquisitions for cash-rich firms (Harford 1999). On the other hand, some studies find evidence against the free cash flow hypothesis. For instance, researchers found that firms returned considerable amounts of the funds repatriated under the AJCA to shareholders through share repurchases rather than squandering them (Blouin and Krull 2009; Dharmapala, Foley and Forbes 2011).

Prior to the TCJA, large US MNCs issued debt rather than incurring the costs of repatriating foreign earnings to complete repurchases and dividend payments. Beyer, Downes, and Rapley (2017) indicate that repatriation costs increase abnormal debt used to fund shareholder payouts. For example, Apple in 2013 borrowed $17 billion rather than accessing their $145 billion in foreign cash holdings (Lattman and Eavis 2013).

Prior research provides evidence that US MNCs access debt markets to return cash to shareholders and spend on domestic investment in response to internal capital market frictions caused by repatriation costs (Beyer, Downes and Rapley 2017; De Simone, Klassen and Seidman 2018). However, it could be argued that under the new reform, the reduction in repatriation costs may therefore lead US MNCs to reduce their debt holdings since debt will not be used in place of repatriation.

Combined with measures to limit profits shifting, such as the Global Intangible Low-Taxed Income (GILTI) minimum tax, the lower US rate reduces incentives for US firms to

book profits in tax havens. According to Garcia-Bernardo, Janský, and Zucman (2022), across all US companies profits booked abroad have decreased by 3–5 percentage points to about 27%. Six examples of large corporations (Alphabet, Microsoft, Facebook, Cisco, Qualcomm, Nike) show a decline in foreign earnings of over 20 percentage points, which coincides with changes in profit shifting – more specifically, with repatriation of intellectual property to the US.

Various ways can be utilized by companies to distribute cash to their shareholders: regular dividends; special dividends; and share buy-backs. For each of the three forms of payout, the firm must have cash available to return to shareholders (Hanlon, Hoopes and Slemrod 2019). However, a number of important tax changes initiated by the TCJA affect profit-shifting incentives for US MNCs. By reducing corporate tax rates and making foreign cash available, the TCJA will increase cash flow to many US firms. Thus, it could argue that "trapped" cash from the pre-TCJA foreign earnings is no longer trapped and is now more readily available for distribution.

As Hemel and Polsky (2019) illustrate, companies avoided taxes by repurchasing shares rather than paying dividends. Unlike dividends, repurchases do not obligate the firm to make future payouts, they can be used to distribute transitory cash flows (Guay & Harford, 2000; Jagannathan et al., 2000). Compared to 2010–2017, real repatriated funds increased by $470 billion in 2018 and 2019. About 60% of the increase in repatriated funds was due to an increase in stock buy-backs, which amounted to $282 billion per year. Similarly, Nessa (2017) found a significant negative association between repatriation tax costs and the probability that a US MNC repurchases shares.

Several studies have documented an increase in share repurchase activity rather than domestic investment following the temporary tax holiday under the AJCA of 2004 (Blouin and Krull 2009; Dharmapala, Foley and Forbes 2011). Lee and Suh (2011) argue that large cash

holdings are the key firm characteristic that is significantly associated with share repurchases. Therefore, when excess funds are returned to shareholders, managers have less money to waste, expropriate, or overinvest in the future, which reduces the agency problem of "empire building" (Jensen 1986).

A deemed repatriation under TCJA may result in an increase of cash available to the US MNCs for domestic investment, and a quasi-territorial system should result in steady cash flow in the future. Based on the explanation above, the hypothesis of this study is stated as follows:

H1*: There is a negative association between income shifting and share repurchases.*

2.3.4 Interaction Effect of Income Shifting with Tax Cost of Repatriating Earnings on Share Repurchases

Tax incentives faced by US MNCs contribute to the magnitude of corporate cash holdings. Under a "worldwide" tax system, in the US and many other countries, foreign profits are taxed but can be deferred until they are repatriated. Due to these incentives, US multinational firms retain earnings abroad and, in large part, these funds are held in cash (Foley et al. 2007). As a result, US firms are potentially unable to distribute cash to their shareholders. In the years before the TCJA, large US MNCs issued debt instead of repatriating foreign earnings to complete repurchases and dividend payments. Beyer, Downes, and Rapley (2017) indicate that repatriation costs increase abnormal debt used to fund shareholder payouts. According to (Desai, Foley and Hines Jr 2001, 2007) affiliates of US MNCs located in low tax jurisdictions have lower dividend payout ratios.

This study therefore posits the next hypothesis:

H2: The negative relationship between income shifting and share repurchases is increased in firms with high levels of tax cost of repatriating earnings

2.3.5 Interaction Effect of Income Shifting with the Advance Pricing Agreement (APA) on Share Repurchases

Many MNCs have turned to an APA to reduce their tax risk (Markham 2012). The APA was introduced in the United States back in 1991 as IRS Revenue Procedure 91-22, and has beenspread to more than 30 countries since then (Eden and Byrnes 2018b). In this type of agreement, the tax authority and MNCs agree on how to conduct transfer pricing, to estimate taxable income, and to pay taxes for a fixed period, reducing the possibility of income tax discrepancies. In addition, this type of tax procedure is designed to be a neutral means of determining the taxable income of MNCs within and across jurisdictions (Eden 2015; Markham 2012). According to (Eden and Byrnes 2018a), APAs are intended to resolve disputes between related parties before a transaction occurs, although they may cover past andfuture related party transactions. Prior studies (Klassen and Laplante (2012); (Marques and Pinho 2016; Riedel, Zinn and Hofmann 2015) indicate that stronger regulations reduce income-shifting activities of MNCs, resulting in increased pre-tax income of low-tax rate affiliates. Asstated by Marques and Pinho (2016), MNCs cannot shift profits to tax havens or lower tax jurisdictions once transfer pricing regulations are strictly enforced. Hence, if US MNCs face strict and enforced transfer pricing regulations this will discourage them from shifting incomeout of the country and this will lead, in turn, to a decrease in corporate cash holding overseas and increase share repurchases. In addition, it is beneficial for the economy as well as the reputation of a country to have a strict system of rules and regulations preventing income- shifting activities. On the basis of the above discussion, I posit the following hypothesis:

H3: There is a positive relationship between income shifting and share repurchases in firms with the advance pricing agreement (APA).

2.4. Methodology and Research Design

2.4.1 Sample Selection

The sample comprises US MNCs covering the period 2006–2021. The sample period corresponds to a period of considerable change in the US tax system. The Tax Cut and Jobs Act (TCJA) of 2018 is the most comprehensive tax reform since 1986. The reform lowers the federal corporate income tax rate from 35% to 21%. Additionally, the TCJA changed the US tax system from a worldwide tax system to a territorial one. The original sample (4720 firm-year observations) is reduced after removal of firms with missing control variables and income-shifting data (1716 firm-year observations). The final sample, thus, comprises 3004 firm-year observations. Financial data were obtained from the *Compustat* database. Income shifting data were collected manually from the accounting to taxable income reconciliation statements within10-K annual reports. Table 2.1, provides a summary of the sample selection. The data are winzorized at the 1st and 99th percentiles to decrease the probability that outliers affect the results.

TABLE 2.1 Sample Selection

Total number of firm-year observations (2006–2021)	4,720
Less: Missing control variables	858
Less : firms with missing income shifting data	858
Final sample	3,004

2.4.2 Variable description

2.4.2.1 Dependent variable

Following prior literature (Dang, De Cesari and Phan 2021; Hoberg, Phillips and Prabhala 2014), share repurchase is measured as the purchase of common and preferred stock minus the reduction in the book value of preferred stock, all scaled by total assets, and purchase of common and preferred stock minus the reduction in the book value of preferred stock, all scaled by sales, respectively.

2.4.2.2 Independent variable

The main explanatory variable for this essay is income shifting (INCS). This study uses the methodology applied in Richardson et al. (2021), which developed a unique measure of income shifting based on differences in group domestic-to-foreign-tax-rate differentials, reported in the accounting income-to-taxable income reconciliations in an MNC's 10-K annual reports. They define their measure of INCS as the fractional reduction in the US statutory tax rate (STR) due to lower (weighted average) foreign tax rates relative to the US STR. Large negative adjustments to prima facie income tax expense on accounting income show that an MNC has the capacity and incentive to move income or to allocate income to jurisdictions that have lower corporate tax rates. Thus, INCS measures the weighted average tax effect of foreign income being taxed at different (generally lower) tax rates in offshore jurisdictions than the equivalent amount of income would be taxed at in the US. INCS_ln is the natural logarithm of *INCS*, and INCS_D is a dummy variable, coded 1 if *INCS* is negative, and 0 otherwise.

2.4.2.3 Control variables

Based on prior share repurchase literature (Billett and Xue 2007; Dang, De Cesari and Phan 2021; DeAngelo, DeAngelo and Stulz 2006; Hoberg, Phillips and Prabhala 2014) , this study controls for various firm characteristics that are found to affect firm share repurchases. These control variables are: firm *Size* measured as the natural log of market capitalization; *Cash flow* computed as operating income before depreciation over total assets. *Retained earnings* is measured as retained earnings over total assets. *Idiosyncratic risk* is the standard deviation of the residuals from a regression of the daily stock return (source: CRSP) in excess of the risk-free rate (from Kenneth French's website) on the market factor based on the value-weighted market return (source: CRSP). Daily returns over the fiscal year are used. *Systematic_ risk* is computed as the standard deviation of the predicted value from a regression of the daily stock return in excess of the risk-free rate on the market factor based on the value-weighted market

return. Daily returns over the fiscal year are used. *Age* refers to the number of years since a firm was incorporated, calculated as log of one plus the number of years since the firm's first appearance in CRSP. *MTB* is firm market value over total assets. *Negative earnings* is binary variable that is equal to one if earnings before interest are negative, otherwise zero. Earnings before interest (IB) is income before extraordinary items plus interest and related expenses (XINT), if available, plus income statement deferred taxes (TXDI), if available. *LEV* is total liabilities over total assets. *Cash* controls for the cash holding ratio, cash and short-term investments over total assets. Finally, I control for industry dummies, to account for constant heterogeneity across sectors, firm fixed effects, to further remove all the sources of constant heterogeneity at the firm level, and year dummies to account for shocks common to the sample firms. To reduce the influence of outliers, all continuous variables are winsorized at the 1 per cent and 99 per cent levels. Definitions of all control variables are in Appendix A.

2.4.3 Model specifications

To examine the relationship between income shifting and share repurchases (H1), I postulate a fixed effects regression model in the form of the following equation:

$$\begin{aligned} Rep_{it} = {} & a0 + \beta_1 INCS_{it} + \beta_2 Size_{it} + \beta_3 Cash\ flow_{it} + \beta_4 Retained\ earning_{it} \\ & + \beta_5 Idiosyncratic\ risk_{it} + \beta_6 Systematic\ risk_{it} + \beta_7 Age_{it} + \beta_8 MTB_{it} \\ & + \beta_9 Negative\ earnings_{it} + \beta_{10} Cash_{it} + \beta_{11} LEV_{it} + \beta_{12} Capital\ expenditure_{it} \\ & + Firm\ FE + Year\ FE + \varepsilon_{it} \end{aligned} \qquad \text{Equation (1)}$$

where *i* denotes a firm MNCs, *t* = financial years 2006–2021, *Rep* = share repurchases, *INCS*= income shifting, and ε = the error term. In all the regression analyses, I control for the effects of both industry (*IND_FE*), and year (*YEAR_FE*) fixed effects, with standard errors clustered by firms. All variables are winsorized at the 1st and 99th percentiles to reduce the likelihood

of outliers affecting results. Appendix A provides the variable definitions and measurement details for all variables.

The model for testing H2 is estimated as follows:

$$Rep_{it} = a0 + \beta_1 INCS_{it} + \beta_2 Repatriating\ Tax\ Cost_{it} + \beta_3 INCS_{it} * Repatriating\ Tax\ Cost_{it} + \beta_4 Size_{it} + \beta_5 Cash\ flow_{it} + \beta_6 Retained\ earning_{it} + \beta_7 Idiosyncratic\ risk_{it} + \beta_8 Systematic\ risk_{it} + \beta_9 Age_{it} + \beta_{10} MTB_{it} + \beta_{11} Negative\ earnings_{it} + \beta_{12} Cash_{it} + \beta_{13} LEV_{it} + \beta_{14} Capital\ expenditure_{it} + Firm\ FE + Year\ FE + \varepsilon_{it}$$

Equation (2)

The model for testing H3 is estimated as follows:

$$Rep_{it} = a0 + \beta_1 INCS_{it} + \beta_2 APA_{it} + \beta_3 INCS_{it} * APA_{it} + \beta_4 Size_{it} + \beta_5 Cash\ flow_{it} + \beta_6 Retained\ earning_{it} + \beta_7 Idiosyncratic\ risk_{it} + \beta_8 Systematic\ risk_{it} + \beta_9 Age_{it} + \beta_{10} MTB_{it} + \beta_{11} Negative\ earnings_{it} + \beta_{12} Cash_{it} + \beta_{13} LEV_{it} + \beta_{14} Capital\ expenditure_{it} + Firm\ FE + Year\ FE + \varepsilon_{it}$$

Equation (3)

where *APA* = advance pricing agreement.

2.5 Empirical Results and Discussion

2.5.1 Descriptive Statistics

Table 2.2 presents descriptive statistics for variables used in the analyses. The mean values for *Rep1*and *Rep2* are 0.04 and 0.05, with standard deviations of 0.06 and 0.08, respectively. They are generally similar to those reported in previous studies (Dang, De Cesari and Phan 2021; Hoberg, Phillips and Prabhala 2014). The mean (median) value of *INCS* is 0.15 (0.00), with a standard deviation of 0.36. The mean (median) value of *INCS_ln* is 0.23 (0.00) and the mean (median) value of *INCS_D* is 0.20 (0.00). In terms of control variables, the mean value of size is 8.77, and of cash flow, 0.10. The average value of the retained earnings is 0.32., capital expenditure as a proportion of property, plant and equipment, 0.04, while MTB is 0.14. The sample firms, on average, have the systematic risk of .01; idiosyncratic risk of 0.01. The mean value of age is 4.09 and the mean value of lev is 0.56; negative earnings is 0.88. The average

value of cash is 0.14. The statistics of the control variables are similar to those in earlier literature (Dang, De Cesari and Phan 2021; Hoberg, Phillips and Prabhala 2014).

Table 2.2 Descriptive statistics

variable	N	Mean	S.D.	P10	P25	P50	P75	P90
Rep1	3004	0.04	0.06	0.00	0.00	0.02	0.05	0.11
Rep2	3004	0.05	0.08	0.00	0.00	0.02	0.07	0.14
INCS	3004	0.15	0.66	0.00	0.00	0.00	0.00	0.21
INCS_ln	3004	0.23	0.42	0.00	0.00	0.00	0.00	1.00
INCS_D	3004	0.20	1.23	0.00	0.00	0.00	0.00	1.66
Cash flow	3004	0.10	0.09	0.03	0.06	0.10	0.14	0.19
Retained earnings	3004	0.32	0.37	-0.08	0.17	0.33	0.51	0.71
Idiosyncratic risk	3004	0.01	0.01	0.00	0.00	0.01	0.02	0.02
Systematic risk	3004	0.01	0.01	0.00	0.00	0.01	0.01	0.01
SIZE	3004	8.77	1.62	6.71	7.46	8.65	10.03	11.00
Capital expenditure	3004	0.04	0.04	0.01	0.02	0.03	0.05	0.09
Age	3004	4.09	0.67	3.18	3.58	4.14	4.66	4.88
MTB	3004	0.14	0.29	0.00	0.01	0.05	0.15	0.38
Negative earnings	3004	0.88	0.33	0.00	1.00	1.00	1.00	1.00
LEV	3004	0.56	0.20	0.32	0.44	0.56	0.68	0.82
Cash	3004	0.14	0.13	0.02	0.04	0.10	0.19	0.33

Notes: This table shows the descriptive statistics of all variables used in the analysis. The variables are defined in Appendix A.

2.5.2 Correlation Analysis

Table 2.3 reports the Pearson pairwise correlation results for the variables used in this study. The independent variable, *INCS*, is negatively correlated with *Rep* (at $p<0.01$), suggesting that firms with higher income shifting have fewer share repurchases, which supports H1. In addition, all control variables are significantly correlated with the dependent variables.

Table 2.3 Pearson Correlation

Variables	1	2	3	4	5	6	7	8
(1) Rep1	1							
(2) Rep2	0.86***	1						
(3) INCS	-0.04**	-0.05***	1					
(4) INCS_In	-0.07***	-0.10***	0.32***	1				
(5) INCS_D	-0.07***	-0.07***	0.73***	0.42***	1			
(6) Cash flow	0.30***	0.22***	0.000	-0.05***	-0.05***	1		
(7) Retained earnings	0.24***	0.15***	-0.03*	-0.08***	-0.08***	0.42***	1	
(8) Idiosyncratic risk	-0.05**	-0.07***	0.03*	0.010	0.020	-0.04**	-0.06***	1
(9) Systematic risk	-0.030	-0.030	0.030	0.000	0.020	0.010	-0.010	0.76***
(10) SIZE	0.010	0.12***	0.020	-0.03*	0.010	0.12***	0.14***	-0.29***
(11) Capital expenditure	0.010	-0.09***	0.020	0.04**	0.020	0.20***	0.13***	0.05***
(12) Age	-0.17***	-0.20***	-0.010	-0.010	0.020	-0.020	0.14***	0.000
(13) MTB	0.09***	0.010	0.010	0.03*	-0.020	-0.04**	-0.16***	0.09***
(14) Negative earnings	0.16***	0.13***	-0.05***	-0.10***	-0.08***	0.51***	0.30***	-0.11***
(15) LEV	-0.020	-0.07***	0.04**	0.09***	0.07***	-0.17***	-0.18***	-0.12***
(16) Cash	0.22***	0.33***	-0.07***	-0.11***	-0.07***	-0.020	-0.12***	0.000

	9	10	11	12	13	14	15	16
(9) Systematic risk	1							
(10) SIZE	-0.17***	1						
(11) Capital expenditure	0.07***	0.05***	1					
(12) Age	0.05***	0.20***	-0.08***	1				
(13) MTB	0.04**	-0.48***	-0.06***	-0.15***	1			
(14) Negative earnings	-0.05***	0.12***	0.05***	0.08***	-0.03*	1		
(15) LEV	-0.13***	0.29***	-0.08***	0.29***	-0.17***	-0.08***	1	
(16) Cash	0.000	-0.10***	-0.21***	-0.37***	0.15***	0.000	-0.31***	1

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

2.5.3 Regression Results

2.5.3.1 The association between income shifting incentives and share repurchases

This study uses Equation (1) to test Hypothesis 1, where firms with higher income-shifting incentives have lower levels of share repurchases. In Columns 1–6 of Table 2.4, the coefficientsof *INCS, INCS_ln and INCS_D* are negative and significant (*p*-value equal to 0.05 or better) for both measures of share repurchases at 0.005; 0.008; 0.002 (*Rep1)* and 0.004; 0.010; 0.002 (*Rep2*), respectively. From an economic perspective, a one standard deviation increase in *INCS*results in a decrease in the share repurchases (*Rep1*) by .33%.[3] This provides support for the first hypothesis in that firms that are exposed to income-shifting activities have less share repurchases (H1). Under the worldwide tax system, the foreign cash for US firms is potentiallynot available to distribute to shareholders. Many companies retained foreign earnings in their foreign subsidiaries to avoid paying the relatively high US tax upon repatriation. Under this system, deferral was a powerful incentive to shift profits to offshore tax havens, which led to decreased share repurchases. Beyer, Downes,and Rapley (2017) indicate that repatriation costs increase abnormal debt used to fundshareholder payouts. For example, Apple in 2013 borrowed $17 billion rather than accessing their $145 billion in foreign cash holdings (Lattman and Eavis 2013). Moreover, Nessa (2017) found asignificant negative association between repatriation tax costs and the probability that a US MNC repurchases shares. Thus, my findings are consistent with the results of previous studies. The estimated coefficients of control variables are generally consistent with those in prior literature (Dang, De Cesari and Phan 2021; Hoberg, Phillips andPrabhala 2014).

[3] The economic effect is computed as one standard deviation of *INCS* (0.66) multiplied by coefficient of *INCS* in Column (1) of Table 2 (-0.005), which is equal to a decline of -0.0033 (0.33%) in share repurchases.

Table 2.4 The impact of income shifting on share repurchases (H1).

VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
	Rep1	*Rep1*	*Rep1*	*Rep2*	*Rep2*	*Rep2*
Constant	0.131	0.140	0.130	0.011	0.024	0.011
	(1.50)	(1.59)	(1.49)	(0.12)	(0.26)	(0.12)
INCS	**-0.005****			**-0.004*****		
	(-2.17)			**(-2.77)**		
INCS_ln		**-0.008*****			**-0.010*****	
		(-2.69)			**(-3.49)**	
INCS_D			**-0.002****			**-0.002****
			(-2.56)			**(-2.49)**
Cash flow	0.140***	0.138***	0.140***	0.102***	0.100***	0.102***
	(3.50)	(3.46)	(3.47)	(3.31)	(3.27)	(3.29)
Retained earnings	0.044***	0.045***	0.044***	0.037***	0.038***	0.037***
	(4.34)	(4.38)	(4.31)	(3.68)	(3.76)	(3.67)
Idiosyncratic risk	0.056	0.052	0.057	-0.033	-0.034	-0.031
	(0.21)	(0.20)	(0.22)	(-0.14)	(-0.15)	(-0.13)
Systematic risk	-0.076	-0.105	-0.091	0.157	0.129	0.146
	(-0.19)	(-0.26)	(-0.22)	(0.41)	(0.34)	(0.38)
SIZE	-0.013***	-0.012***	-0.013***	-0.008*	-0.007*	-0.008*
	(-3.13)	(-3.07)	(-3.22)	(-1.81)	(-1.69)	(-1.87)
Capital expenditure	0.229***	0.233***	0.226***	0.155***	0.163***	0.153***
	(3.89)	(3.97)	(3.86)	(2.74)	(2.88)	(2.71)
Age	-0.012	-0.014	-0.011	0.010	0.006	0.011
	(-0.50)	(-0.61)	(-0.46)	(0.43)	(0.26)	(0.47)
MTB	0.020*	0.020*	0.020*	0.007	0.007	0.007
	(1.73)	(1.73)	(1.74)	(1.02)	(1.04)	(1.05)
Negative earnings	-0.012**	-0.011**	-0.011**	-0.007	-0.007	-0.007
	(-2.06)	(-2.05)	(-2.02)	(-1.46)	(-1.52)	(-1.45)
LEV	0.070***	0.070***	0.069***	0.068***	0.068***	0.067***
	(3.65)	(3.63)	(3.59)	(3.86)	(3.89)	(3.81)
Cash	0.027	0.027	0.027	0.081***	0.081***	0.081***
	(1.09)	(1.06)	(1.09)	(2.88)	(2.86)	(2.89)
YEAR FE	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES
Observations	3,004	3,004	3,004	3,003	3,003	3,003
Adj. R-squared	0.369	0.368	0.368	0.455	0.456	0.455

Notes: The table presents the fixed effects regression results on the effect of income shifting on share repurchases. The dependent variable *(Rep1and Rep2)* is measured as Purchase of common and preferred stock minus the reduction in the book value of preferred stock, all scaled by total assets. Purchase of common and preferred stock minus the reduction in the book value of preferred stock, all scaled by sales. The variable of interest, INCS .All control variables are defined in Appendix A. Coefficient estimates are reported with *t*-statistics in parentheses. Statistically significant of the estimates are denoted with asterisks: ***, **and* correspond to 1%, 5% and 10% levels of significance, respectively.

2.6 Endogeneity Tests

2.6.1 Propensity Score Matching (PSM) Analysis

Propensity score matching (PSM) analysis is used to address concerns that the regression coefficients could be impacted due to self-selection bias. Based on Shipman, Swanquist, and Whited (2017) approach, all control variables are included in the first-stage regression model designed to compute propensity scores, or predicted values for each firm-year observation. The

dependent variables *Rep1and Rep2* are purchase of common and preferred stock minus the reduction in the book value of preferred stock, all scaled by total assets, and purchase of common and preferred stock minus the reduction in the book value of preferred stock, all scaled by sales, respectively.

Based on comparable propensity scores, the treatment and control firm-year observations are matched using the radius method. Panel A of Table 2.5 show that the covariates between the treatment and control groups follow the matching process. The variables in the two groups do not differ statistically, as covariate equilibrium is the objective of propensity score matching (Hainmueller 2012). Panel B of Table 2.5 presents the results of the second-stage regression for the PSM sample. The estimated coefficient of *INCS, INCS_ln and INCS_D* are significantly negative (at $p<0.01$). These results provide support for the main findings that firms with greater income-shifting incentives have fewer share repurchases.

Table 2.5 Propensity score matching (PSM) analysis

Panel A: Covariate balance test

	Mean		
Variable	**Treated**	**Control**	***t***
Cash flow	0.086	0.096	-2.23
Retained earnings	0.279	0.309	-1.51
Idiosyncratic risk	0.012	0.012	0.35
Systematic risk	0.007	0.007	0.01
SIZE	8.641	8.721	-0.89
Capital expenditure	0.047	0.046	0.45
Age	4.083	4.120	-1.02
MTB	0.162	0.140	1.25
Negative earnings	0.806	0.862	-2.77
LEV	0.589	0.580	0.89
Cash	0.114	0.117	-0.59

Panel B: Second stage regression results

VARIABLES	**Model (1)**	**Model(2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**
	Rep1	*Rep1*	*Rep1*	*Rep2*	*Rep2*	*Rep2*
Constant	0.077	0.085	0.077	-0.064	-0.052	-0.064
	(1.21)	(1.34)	(1.21)	(-1.02)	(-0.84)	(-1.02)
INCS	**-0.004*** **			**-0.002** **		
	(-3.66)			**(-2.02)**		
INCS_ln		**-0.005** **			**-0.007*** **	
		(-2.36)			**(-3.28)**	
INCS_D			**-0.002*** **			**-0.002** **
			(-3.33)			**(-2.49)**
Cash flow	0.169***	0.168***	0.172***	0.108***	0.107***	0.110***
	(10.42)	(10.33)	(10.54)	(6.66)	(6.58)	(6.76)
Retained earnings	0.045***	0.046***	0.044***	0.035***	0.036***	0.035***
	(7.36)	(7.49)	(7.30)	(5.80)	(5.98)	(5.76)
Idiosyncratic risk	-0.088	-0.085	-0.080	-0.203	-0.196	-0.196
	(-0.50)	(-0.48)	(-0.46)	(-1.17)	(-1.13)	(-1.13)
Systematic risk	-0.235	-0.286	-0.268	0.152	0.116	0.136
	(-0.76)	(-0.92)	(-0.86)	(0.50)	(0.38)	(0.45)
SIZE	-0.012***	-0.012***	-0.013***	-0.007**	-0.007**	-0.007**
	(-3.99)	(-3.95)	(-4.11)	(-2.41)	(-2.25)	(-2.47)
Capital expenditure	0.298***	0.298***	0.293***	0.196***	0.203***	0.194***
	(6.07)	(6.07)	(5.98)	(4.07)	(4.20)	(4.03)
Age	0.002	0.000	0.003	0.028*	0.025*	0.029*
	(0.13)	(0.02)	(0.20)	(1.91)	(1.69)	(1.94)
MTB	0.024***	0.025***	0.025***	0.007*	0.007*	0.007*
	(5.66)	(5.81)	(5.78)	(1.71)	(1.76)	(1.76)
Negative earnings	-0.019***	-0.018***	-0.019***	-0.011***	-0.011***	-0.011***
	(-5.35)	(-5.23)	(-5.39)	(-3.26)	(-3.34)	(-3.35)
LEV	0.048***	0.047***	0.047***	0.043***	0.042***	0.042***
	(4.54)	(4.42)	(4.37)	(4.05)	(4.04)	(3.97)
Cash	0.026	0.026	0.027	0.096***	0.097***	0.096***
	(1.55)	(1.54)	(1.56)	(5.73)	(5.78)	(5.74)
YEAR FE	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES
Observations	3,003	3,003	3,003	3,002	3,002	3,002
Adj. R-squared	0.409	0.407	0.408	0.478	0.479	0.478

Notes: This table reports the results of PSM analysis. Variable definitions are in Appendix A. Coefficient estimates with *t*-statistics reported in parentheses. The statistical significance of the estimates is denoted with asterisks: ***, ** and * correspond to 1%, 5% and 10% levels of significance, respectively.

2.6.2 Difference-in Difference Procedure

In this section, I evaluate the change in relationship between income shifting and share repurchases when tax rules changed in 2018. As a result of rising calls for tax reform and Republican control of the White House and Congress, the Tax Cut and Jobs Act (TCJA) was passed in 2017 – which is known as tax reform. The TCJA of 2018 is the largest US tax law change in three decades, which led to the most significant changes in tax policy since the Tax Reform Act of 1986 (Auerbach 2018; Dyreng et al. 2020). Before the TCJA, the United States had a worldwide tax system that deferred taxes, sometimes called a credit system. As a result, many companies retained foreign earnings in their foreign subsidiaries to avoid paying the relatively high US tax upon repatriation. Under this system, deferral was a powerful incentive to shift profits to offshore tax havens, where they might incur less tax and receive better treatment once they were repatriated (Foley et al. 2007).

The new reform lowered the federal corporate income tax rate from 35% to 21% and it was designed to stimulate the economy through supply-side incentives. Additionally, the TCJA established a territorial system of eliminating taxes on repatriation of actively earned profits by foreign subsidiaries to US parent companies, protecting the integrity of the territorial system, reducing profit shifting, and encouraging companies to locate profit centres and real activity within the US

As a result of the TCJA, the reduction in the corporate tax rate may reduce the incentives to shift profits away from the US. This may in turn have the effect of increasing corporate cash holdings. Following the TCJA enactment, the stock market generally reacted positively, indicating that market participants expected significant tax savings for corporations under the new law (Wagner, Zeckhauser and Ziegler 2018). However, with new tax reform, several changes were made that would affect the profit-shifting incentives for MNCs. MNCs booked a majority of their direct investment earnings in just seven countries in 2017, and these seven countries accounted for the vast majority of globalprofits

shifted by US MNCs. Various data sets and methods indicate that profit shifting by US multinational companies reduced corporate tax revenues by large magnitudes by 2017.

Therefore, the adoption of the TCJA is used as an exogenous shock, which has undoubtedly influenced profit shifting. To conduct the difference-in-difference (DID) analysis, coded as 1 for years from and including 2018, and 0 before 2018, the *DID* variable is interacted with *INCS, INCS_ln and INCS_D,* and the regression results are providedin Table 2.6. It is found that the variable of interest, *INCS, INCS_ln and INCS_D,* are significantly and positively related to share repurchases, indicating that new reform of the TCJA gave rise to higher levels of cash holdings, which led to more share repurchases from 2018. The results suggest that the new reform provided US MNCs with less incentives to shiftincome abroad from 2018.

Table 2.6 Difference-in-difference (DID) test

VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
	Rep1	*Rep1*	*Rep1*	*Rep2*	*Rep2*	*Rep2*
Constant	0.128*	0.137*	0.120*	-0.000	0.020	-0.004
	(1.77)	(1.88)	(1.66)	(-0.00)	(0.26)	(-0.05)
INCS	**-0.015*** **			**-0.009** **		
	(-4.72)			**(-2.56)**		
INCS_ln		**-0.017*** **			**-0.021*** **	
		(-2.92)			**(-3.42)**	
INCS_D			**-0.006*** **			**-0.004** **
			(-3.80)			**(-2.29)**
If Year≥2018	0.010	0.007	0.011	0.015*	0.009	0.015*
	(1.31)	(0.93)	(1.48)	(1.85)	(1.07)	(1.92)
INCS_≥2018	**0.013*** **			**0.006***		
	(3.72)			**(1.71)**		
INCS_ln _≥2018		**0.012***			**0.014** **	
		(1.81)			**(2.01)**	
INCS_D _≥2018			**0.006*** **			**0.003**
			(3.02)			**(1.46)**
Cash flow	0.139***	0.138***	0.139***	0.101***	0.100***	0.101***
	(8.58)	(8.49)	(8.55)	(5.65)	(5.58)	(5.65)
Retained earnings	0.044***	0.045***	0.044***	0.037***	0.038***	0.037***
	(6.91)	(7.04)	(6.81)	(5.36)	(5.54)	(5.30)
Idiosyncratic risk	0.047	0.036	0.050	-0.037	-0.053	-0.034
	(0.26)	(0.20)	(0.27)	(-0.19)	(-0.27)	(-0.17)
Systematic risk	-0.046	-0.092	-0.063	0.172	0.145	0.160
	(-0.14)	(-0.28)	(-0.19)	(0.49)	(0.42)	(0.46)
SIZE	-0.013***	-0.013***	-0.013***	-0.008**	-0.007**	-0.008**
	(-3.81)	(-3.80)	(-3.93)	(-2.13)	(-2.05)	(-2.21)
Capital expenditure	0.223***	0.233***	0.223***	0.152***	0.163***	0.151***
	(4.17)	(4.34)	(4.16)	(2.64)	(2.83)	(2.62)
Age	-0.014	-0.015	-0.011	0.009	0.005	0.010
	(-0.84)	(-0.93)	(-0.67)	(0.49)	(0.26)	(0.59)
MTB	0.019***	0.020***	0.020***	0.006	0.007	0.007
	(3.88)	(4.04)	(4.06)	(1.19)	(1.23)	(1.29)
Negative earnings	-0.011***	-0.011***	-0.011***	-0.007	-0.007	-0.007
	(-2.75)	(-2.74)	(-2.74)	(-1.53)	(-1.53)	(-1.53)
LEV	0.070***	0.070***	0.068***	0.068***	0.068***	0.066***
	(6.21)	(6.21)	(6.04)	(5.57)	(5.60)	(5.47)
Cash	0.027*	0.027	0.027	0.081***	0.081***	0.081***
	(1.65)	(1.64)	(1.64)	(4.59)	(4.60)	(4.59)
YEAR FE	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES
Observations	3,004	3,004	3,004	3,003	3,003	3,003
Adj. R-squared	0.372	0.369	0.370	0.455	0.457	0.455

Notes: This table reports the regression results using a DID indicator variable which equals to 1 for years 2018, and 0 otherwise, to take into account the tax reform change in 2017. All variables are defined in Appendix A. Coefficient estimates with *t*-statistics reported in parentheses. The statistical significance of the estimates is denoted with asterisks: ***, ** and * correspond to 1%, 5% and 10% levels of significance, respectively.

2.6.3 Additional Analyses

I conduct cross-sectional tests to examine the channels that could affect income-shifting incentives on share repurchases. The channels include tax cost of repatriating earnings and existence of an advance pricing agreement (APA) with taxing authorities.

2.6.3.1 Tax cost of repatriating earnings

An examination of the impact of tax costs of repatriating earnings on share repurchases (H2) is then undertaken. The regression results are presented in Columns 1–6 of Table 2.7. The coefficients of the interaction terms *INCS*RTC, INCS_ln*RTC and INCS_D _RTC* in Columns 1–6 of Table 2.7 are all significantly negative (at $p<0.01$). This indicates that with high tax cost of repatriating earnings, US MNCs have more incentives to retain cash overseas, which lead to less share repurchases. Previous studies (Foley et al. 2007) argues that MNCs retain cash overseas because of the high cost of repatriating foreign income.

Table 2.7 Interaction effect of income shifting with Tax Cost of Repatriating Earnings on share repurchases

VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
	Rep1	*Rep1*	*Rep1*	*Rep2*	*Rep2*	*Rep2*
Constant	0.129*	0.142**	0.131*	0.003	0.019	0.006
	(1.90)	(2.09)	(1.94)	(0.04)	(0.27)	(0.08)
INCS	**-0.004****			**-0.004****		
	(-2.53)			**(-2.06)**		
INCS_ln		**-0.007****			**-0.009*****	
		(-2.39)			**(-3.17)**	
INCS_D			**-0.002****			**-0.002***
			(-2.01)			**(-1.86)**
Repatriating Tax Cost	0.187***	0.181***	0.184***	0.191***	0.184***	0.192***
	(3.41)	(3.31)	(3.37)	(3.25)	(3.13)	(3.27)
INCS_Repatriating Tax Cost	**-0.042****			**-0.030**		
	(-2.43)			**(-1.63)**		
INCS_ln_Repatriating TaxCost		**-0.274*****			**-0.200****	
		(-3.12)			**(-2.12)**	
INCS_D_Repatriating Tax Cost			**-0.038*****			**-0.029****
			(-2.86)			**(-2.02)**
Cash flow	0.141***	0.140***	0.141***	0.102***	0.102***	0.103***
	(8.67)	(8.62)	(8.69)	(5.72)	(5.68)	(5.74)
Retained earnings	0.045***	0.046***	0.045***	0.038***	0.039***	0.037***
	(7.01)	(7.12)	(6.97)	(5.47)	(5.60)	(5.43)
Idiosyncratic risk	0.059	0.061	0.060	-0.033	-0.031	-0.031
	(0.32)	(0.33)	(0.33)	(-0.17)	(-0.16)	(-0.16)
Systematic risk	-0.114	-0.146	-0.130	0.130	0.099	0.116
	(-0.35)	(-0.45)	(-0.40)	(0.37)	(0.28)	(0.33)
SIZE	-0.012***	-0.012***	-0.013***	-0.007**	-0.007*	-0.007**
	(-3.73)	(-3.71)	(-3.82)	(-2.01)	(-1.92)	(-2.08)
Capital expenditure	0.227***	0.229***	0.224***	0.155***	0.161***	0.152***
	(4.23)	(4.26)	(4.17)	(2.68)	(2.78)	(2.63)
Age	-0.012	-0.015	-0.012	0.011	0.006	0.011
	(-0.74)	(-0.93)	(-0.74)	(0.59)	(0.35)	(0.60)
MTB	0.020***	0.020***	0.020***	0.007	0.007	0.007
	(4.04)	(4.06)	(4.09)	(1.31)	(1.31)	(1.35)
Negative earnings	-0.011***	-0.011***	-0.011***	-0.007	-0.007	-0.007
	(-2.85)	(-2.87)	(-2.84)	(-1.53)	(-1.62)	(-1.54)
LEV	0.071***	0.072***	0.070***	0.069***	0.069***	0.068***
	(6.34)	(6.37)	(6.25)	(5.65)	(5.71)	(5.57)
Cash	0.024	0.023	0.024	0.078***	0.078***	0.078***
	(1.45)	(1.40)	(1.45)	(4.43)	(4.40)	(4.43)
YEAR FE	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES
Observations	3,001	3,001	3,001	3,000	3,000	3,000
Adj. R-squared	0.371	0.371	0.370	0.457	0.458	0.456

Notes: Table 2.7 reports the additional analyses on the interaction effect of income shifting with Tax Cost of Repatriating Earnings on share repurchases. Variables are defined in Appendix A. Robust *t*-statistics are in brackets. *, **, and *** denote two-tailed significance at $p<0.1$, 0.05 and 0.01, respectively

2.6.3.2 Advance pricing agreement (APA)

I now investigate the interaction of income shifting with theexistence of an advance pricing agreement (APA) on share repurchases. The regression results are presented in Columns 1–6 of Table 2.8 with dependent variable being *Rep*. The coefficient of *INCS*, *INCS_ln* and *INCS_D_APA* are significantly positive (at $p<0.01$). This result confirms that stricter regulations are effective in curbing the extent of profit-shifting activities, which increase corporate cash holdings and share repurchases. For example, a number of important tax changes initiated by the TCJA affect profit-shifting incentives for US MNCs. By reducing corporate tax rates and making foreign cash available, the TCJA will increase cash flow to many US firms. Thus, it could argue that "trapped" cash from the pre-TCJA foreign earnings is no longer trapped and is now more readily available for distribution (Marques and Pinho 2016).

Table 2.8 Interaction effect of income shifting with the Advance Pricing Agreement (APA) on share repurchases.

VARIABLES	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
	Rep1	*Rep1*	*Rep1*	*Rep2*	*Rep2*	*Rep2*
Constant	0.134	0.144	0.137	0.013	0.027	0.017
	(1.54)	(1.64)	(1.58)	(0.14)	(0.29)	(0.18)
INCS	**-0.007****			**-0.005*****		
	(-2.57)			**(-3.45)**		
INCS_ln		**-0.010*****			**-0.012*****	
		(-3.13)			**(-3.68)**	
INCS_D			**-0.004*****			**-0.003*****
			(-3.86)			**(-3.65)**
APA	-0.010	-0.012	-0.010	-0.006	-0.009	-0.006
	(-0.89)	(-1.14)	(-0.90)	(-0.39)	(-0.59)	(-0.41)
INCS_APA	**0.011****			**0.008****		
	(2.56)			**(2.26)**		
INCS_ln _APA		**0.014****			**0.012****	
		(2.25)			**(2.06)**	
INCS_D _APA			**0.008*****			**0.006*****
			(3.69)			**(3.28)**
Cash flow	0.141***	0.138***	0.140***	0.103***	0.101***	0.102***
	(3.52)	(3.47)	(3.46)	(3.35)	(3.28)	(3.28)
Retained earnings	0.045***	0.045***	0.044***	0.037***	0.038***	0.037***
	(4.37)	(4.42)	(4.31)	(3.71)	(3.79)	(3.67)
Idiosyncratic risk	0.054	0.039	0.051	-0.033	-0.045	-0.034
	(0.20)	(0.15)	(0.19)	(-0.14)	(-0.20)	(-0.15)
Systematic risk	-0.085	-0.086	-0.100	0.150	0.145	0.138
	(-0.21)	(-0.21)	(-0.24)	(0.39)	(0.38)	(0.36)
SIZE	-0.013***	-0.012***	-0.014***	-0.008*	-0.007*	-0.008**
	(-3.26)	(-3.04)	(-3.36)	(-1.89)	(-1.65)	(-1.96)
Capital expenditure	0.231***	0.232***	0.226***	0.156***	0.162***	0.153***
	(3.93)	(3.95)	(3.88)	(2.76)	(2.86)	(2.71)
Age	-0.011	-0.015	-0.011	0.010	0.005	0.010
	(-0.48)	(-0.65)	(-0.48)	(0.46)	(0.22)	(0.45)
MTB	0.020*	0.020*	0.020*	0.007	0.007	0.007
	(1.72)	(1.72)	(1.73)	(1.00)	(1.04)	(1.04)
Negative earnings	-0.012**	-0.011**	-0.012**	-0.007	-0.007	-0.007
	(-2.09)	(-2.06)	(-2.05)	(-1.50)	(-1.53)	(-1.47)
LEV	0.071***	0.071***	0.069***	0.068***	0.069***	0.067***
	(3.68)	(3.65)	(3.59)	(3.87)	(3.91)	(3.81)
Cash	0.026	0.026	0.027	0.081***	0.080***	0.081***
	(1.05)	(1.04)	(1.07)	(2.86)	(2.84)	(2.87)
YEAR FE	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES
Observations	3,004	3,004	3,004	3,003	3,003	3,003
Adj. R-squared	0.370	0.369	0.370	0.455	0.457	0.456

Notes: Table 2.8 reports the additional analyses on the interaction effect of income shifting with the Advance Pricing Agreement (APA) on share repurchases. Variables are defined in Appendix A. Robust *t*-statistics are in brackets. *, **, and *** denote two-tailed significance at $p<0.1$, 0.05 and 0.01, respectively

2.7 Conclusion

This study examines the relationship between income-shifting incentives and share repurchases. US MNCs that engage in income-shifting activities have less share repurchases. In addition, this study explores two channels that have the potential to moderate this relationship, namely the tax cost of repatriating earnings and an advance pricing agreement. This study finds that the negative relationship between income shifting and share repurchases is magnified in firms with a high tax cost of repatriating earnings. In contrast, US MNCs with an advance pricing agreement tend to have more share repurchases. This result indicates that stricter regulations will be effective in curbing the extent of profit-shifting activities, which increase corporate cash holdings and share repurchases. Finally, the results of this study should also be of interest to academics and policymakers in considering the potential implications of the recent tax reforms and territorial tax system under the Tax Cut Jobs Act. The results also encourage governments to adopt stricter regulations, such as an advance pricing agreement, in order to mitigate adverse effects of income-shifting activities.

Chapter Three

Income shifting incentives and financial restatement: Evidence from U.S

3.1 Introduction..... 58
3.2 Literature Review and Hypotheses Development..... 61
3.3 Research design 70
3.4 Empirical analyses 75
3.5 Additional analyses..... 84
3.6 Endogeneity tests 86
3.7 Conclusion 88

3.1 Introduction

Income shifting has been high on the political agenda in developed countries in recent years. There has been increased interest in profit erosion through income shifting from politicians and the media (Norris 2013). What is new is the attention being paid by policymakers and other stakeholders regarding the longer-term consequences of income-shifting activities by MNCs. In 2015, the Organization for Economic Co-operation and Development (OECD) and G20 countries launched the *Base Erosion and Profit Shifting* (BEPS) project. The OECD/G20 are currently addressing artificial profit shifting by multinationals through transfer of profits from higher-tax jurisdictions to lower-tax jurisdictions. Currently, in order to improve the coherence of international tax rules and ensure that tax environments are transparent across countries and jurisdictions, more than 135 countries and jurisdictions are collaborating through a set of 15 actions and related solutions (Morrison 2016).

From the mid-1990s to the early 2000s, financial and tax reporting aggressiveness increased. Over this period, numerous companies were investigated and prosecuted for tax shelter fraud and for fraudulent accounting practices (Frank, Lynch and Rego 2009). For instance, the complexity created by tax sheltering was used by Tyco International to mask their rent extraction behaviour (Desai 2005). According to Lennox, Lisowsky, and Pittman (2013), this has increased significantly over the last two decades for firms that restated earnings. As a consequence of the upward trend in restatements, the average effective tax rate for corporations in the US has significantly declined (Dyreng et al. 2017).

However, extensive research has examined the effect of income shifting in different aspects, such as corporate investment (De Simone, Klassen and Seidman 2019), information asymmetry (Chen et al. 2018), cost of equity capital (Richardson et al. 2021), and firm bankruptcy (Dhawan, Ma and Kim 2020). However, the linkage between income shifting and

restatement has not been considered in the literature. Therefore, this essay will fill this gap by exploring the effect of income shifting on the likelihood of a restatement.

Using hand-collected data comprising a sample of 270 MNCs over the 2006–2019 period (2,972 firm year observations), this study finds that income shifting is significantly positively associated with restatement after controlling for income shifting and other determinants of the restatement. On average, a one-standard deviation increase in income shifting is associated with an increase in the restatement of about 0.9%. Finally, I find that the association between income shifting and accounting restatements is more prominent for MNCs operating in tax haven countries.

This study makes several contributions to the literature. First, to the best of my knowledge, this is the first study to empirically examine the association between income shifting and accounting restatements. Previous studies examined the relationship between income shifting and corporate investment (De Simone, Klassen and Seidman 2019), information asymmetry (Chen et al. 2018), cost of equity capital (Richardson et al. 2021), and firm bankruptcy (Dhawan, Ma and Kim 2020). To the best of my knowledge, there is no research that examines the association between income shifting and accounting restatements.

Second, this study uses a unique hand-collected data of a sample of 270 MNCs over the 2006–2019 period. In particular, this study uses a unique measure of income shifting based on differences in group domestic-to-foreign tax rate differentials that are evident in accounting income-to-taxable income reconciliations. Third, income shifting is associated with tax haven utilization (Desai, Foley and Hines Jr 2006a), research and development (Barker, Asare and Brickman 2017) and accruals quality (Putri, Rohman and Chariri 2016). All these factors could mediate the relation between income shifting and accounting restatements. Therefore, this study investigates tax haven utilization, research and development and accruals quality on this relationship.

Tax havens are characterized by secrecy in information exchange, and the lack of exchange of tax information with regulators, tax authorities, or other governments (Leikvang 2012). Such secrecy laws increase managers' ability to hide complex tax avoidance strategies from shareholders (Black, Dikolli and Dyreng 2014; Leikvang 2012). Also, regulators and tax authorities may not be able to act as additional monitors of manager behaviour due to such poor information exchange (El Ghoul, Guedhami and Pittman 2011). Consequently, MNCs have substantial leeway to take advantage of these tax haven jurisdictions.

Finally, the results of this study should be of interest to regulators in auditing, financial reporting, and taxation. As the proportion of financial statement restatements motivated by tax-related issues continues to increase, I believe that it is important from a policy perspective to mitigate opportunities for income-shifting activities by MNCs and also improve the coherence of international tax rules and ensure the transparency of tax environments across countries and jurisdictions. In addition, a tax-motivated accounting restatement can alert regulators and the Internal Revenue Service (IRS)[4] of potential deficiencies associated with a corporation's aggressive financial reporting related to the corporation's income tax liability. In addition, this study is also useful for shareholders and investors. Given that income shifting increases the likelihood of accounting restatements, shareholders and investors can view abnormalities in a firm's income-shifting activities as potential red flags and can demand additional risk premiums from firms engaging in income shifting.

The remainder of this chapter is structured as follows. Section 2 outlines the prior literature and hypothesis development. Section 3 describes the research design. Section 4 presents the empirical results, and Section 5 describes additional analyses. Section 6 describes endogeneity tests and Section 7 concludes the chapter.

[4] IRS is the revenue service of the United States federal government that collects taxes and administers the Internal Revenue Code, the main body of the federal statutory tax law. See: https://www.irs.gov/

3.2 Prior Literature and Hypothesis Development

3.2.1. Financial Restatements

Financial reporting is an important mechanism to transfer firm-specific information to dispersed shareholders. One of the key objectives of financial reporting is to reduce the information asymmetry between managers and providers of external capital (Ferracuti and Stubben 2019). Though financial statements are prepared in accordance with Generally Accepted Accounting Principles (GAAP), accounting standards can be flexible and can be exploited to inflate firms' balance sheets and income statements, leading to restatements (Albring et al. 2013).The Securities and Exchange Commission describes restatements as "the most visible indicator of improper accounting – and source of new investigations" (Schroeder 2001). In addition, Baber et al. (2009) define restatements "as corrections of accounting misstatements made previously by negligent, or in the extreme, opportunistic managers". Graham, Li, and Qiu (2008) state that a firm may voluntarily undertake a restatement or at the request of auditors or regulators of the firm.

Over the past decade, a number of public companies restated financial statements due to errors or misleading information in previously published financial reports. The reasons for the financial statement restatement include inherent risks, control risks, and inspection risks (Mao 2018). Intrinsic risk refers to accounting complexity, including business complexity and complexity of accounting rules. When applying accounting policies, managers may make mistakes if accounting complexity is high, which leads to an increase in the possibility of unintentional misstatements or may increase manipulation by management, and the increase in inherent risks increases the probability of restatements. A second reason for the likelihood of restatements is control risk, which refers to the company's internal control level. When the internal control level of the company is low, or the internal control role is not played effectively

and there are major defects, errors will enter the financial reporting system of the firm. Thus, internal control risk will result in a higher probability of financial restatements. The final reason is inspection risks, which refers to the auditing effort applied in verification of the financial statements. To cope with the increased risk of misstatements, the auditor will use increased audit effort, thereby reducing the possibility of errors or omissions going undetected. As the audit effort increases, the risk of restatements declines (Mao 2018).

Accounting restatements give rise to reduced financial statement credibility. For example, Chen, Cheng, and Lo (2014); (Wilson 2008) provides evidence of a lower earnings response following occurrence of restatements. Kravet and Shevlin (2010) find an increase in the factor loadings on the discretionary information risk following a restatement announcement. In addition, restatements increase investor uncertainty. Graham, Li, and Qiu (2008) provide evidence that restatements may influence investors assess to cash flows of a firm and uncertainty over financial statements in general. Investors are therefore less dependent on the information in financial reports when making decisions (Chen, Elder and Hung 2014). Other consequences of restatements are an increase in cost of capital (Kravet and Shevlin 2010), poorer contract terms (Graham et al.,, 2008; Karpoff et al., 2008), large drops in market prices (Wilson 2008), managerial turnover (Desai, Hogan and Wilkins 2006; Land 2010), and increased litigation risk (Bardos, Golec and Harding 2013).

3.2.2. Income Shifting

Utilization of tax havens has increased even as countries become more competitive with their corporation tax rates (OECD, 2013). This shows that the impact of corporate tax rates in their home countries appears to be small; this implies that MNCs are likely to use tax havens irrespective of the statutory domestic rate and to benefit significantly from the strong host

countries' specific benefits of tax havens. The particular advantage is that their tax liability is significantly reduced (Jones and Temouri 2016).

Any MNC has the goal of increasing profits, so corporate taxes appear as an expense, which MNCs naturally try to reduce. Tax minimization strategies are also known as tax sheltering, tax avoidance, tax evasion, tax planning, and even tax fraud (Klassen, Lang and Wolfson 1993; Klassen, Lisowsky and Mescall 2017; Phillips, Petersen and Palan 2021; Wilson 2009). These nomenclatures bring with them a variety of definitions. Dyreng, Hanlon, and Maydew (2008) defining income shifting as the reduction of a firm's effective tax rate in compliance with the law, or within grey-area interpretations of its provisions. In addition, income shifting is defined as an arrangement that results in higher profits allocated to lower-tax rate jurisdictions than would otherwise be expected, based on a MNCs worldwide asset allocation (Gravelle 2013). As a way to reduce group income tax expenses and to achieve capital management, investment and financial reporting objectives, MNCs engage in income shifting (Collins, Kemsley and Lang 1998; De Simone, Mills and Stomberg 2019; Klassen and Laplante 2012). However, previous studies provide evidence of the benefits and costs associated with income shifting.

3.2.2.1. Tax savings associated with income shifting.

MNCs can significantly increase their after-tax cash flow by establishing subsidiaries in tax haven jurisdictions (Gravelle 2009). The positive effects of income shifting extend beyond the obvious cash flow benefits of tax savings. For instance, Cai and Liu (2009) find that income shifting can enhance a firm's competitive position. Desai, Foley, and Hines Jr (2006a) find that income shifting in US (using tax havens) can improve the efficiency of firms' investment allocation.

3.2.2.2. Potential risks associated with income shifting

Transparency costs

Increased use of tax haven subsidiaries by MNCs could lead to complex and secretive corporate structures that reduce the transparency of their global operations (Ben Amar et al. 2019; Desai, Dyck and Zingales 2007). Because of opacity of information, information asymmetry increase and level of uncertainty of future cash flows and earnings will increase. Desai and Dharmapala (2006) conclude that income-shifting activities are inherently opaque since this opacity is required to hide these activities from tax authorities. They also claim that reduced tax disclosure and greater secrecy of management activities relating to taxation are two manifestations of this opacity, which leads to greater information asymmetry and reduced corporate transparency. However, Bressler (2018) argues that transparency is associated with a lower probability of accounting restatement. The use of income shifting could possibly result in higher accounting restatements.

Balakrishnan, Blouin, and Guay (2019) provide evidence that tax-aggressive firms are less financially transparent and have greater information asymmetry. Hope, Ma, and Thomas (2013) find that US firms that engage in more tax avoidance are less likely to voluntarily disclose foreign income, suggesting that managers of these companies actively seek to maintain firm opacity and increase information asymmetry. Similarly, Frank, Lynch, and Rego (2009) find that tax-aggressive firms also tend to be aggressive in their financial reporting. Moreover, Durnev, Li, and Magnan (2017) claim that companies operating in offshore financial centres have lower financial reporting quality (higher accruals-based and real earnings management) than similar companies without offshore operations. Kim et al. (2011) add that managers might claim that the more complex and opaque a tax transaction is, the less chance they have of being caught by tax authorities. Therefore, the increase in information asymmetry and less transparency increases the likelihood of accounting restatements.

Agency costs

The agency theory of tax avoidance suggests that firms manipulate financial statements to hide their rent extraction behaviour using complex tax strategies (Desai and Dharmapala 2006). However, firms can use tax haven or income-shifting activity by not reporting their taxable income (Wilson 2009). Hanlon and Heitzman (2010) argue that income shifting strategies are more complex and riskier. Thus, the complexity provides more opportunities for managerial rent extractions, which mitigates the positive effect of cash tax savings. Chen et al. (2018) argue that tax-motivated income shifting led to more complex firm operations and their accounting information being less transparent, resulting in a reduction of information quality, and therefore, an increase in restatement. Balakrishnan, Blouin, and Guay (2019) find that incorporating subsidiaries in jurisdictions with different tax regimes and engaging in complex transactions (e.g. income shifting) between group affiliates, MNCs produce opaque financial statements that obscure investors' ability to properly assess the information, thus increasing transparency costs.

Additionally, Burton and Tanyi (2019) argue from an agency theory perspective that the same incentives that encourage management to engage in aggressive tax accounting may also encourage them to engage in tax-related GAAP violations. In the late 1990s and early 2000s tax planning strategies were used by numerous US companies that reported significant GAAP-related deficiencies (Lennox, Lisowsky and Pittman 2013). Frank, Lynch, and Rego (2009), find that firms do not always engage in trade-offs between financial and tax decisions; rather, in certain situations, firms use areas of nonconformity between financial accounting and tax rules to manage book income upward and taxable income downward in the same period. Thus, financial statement aggressiveness related to tax accounts may lead to a need for a restatement of the financial statements. Donohoe and Robert Knechel (2014) also find that

more complex tax activities increase financial reporting risk and lead to higher audit fees and presumably higher audit effort.

3.2.3. Hypothesis Development

From the above discussion it could be argued that there is a significant agency and information risk associated with income shifting. Income-shifting activities can be used as a smokescreen to mask managers' diversionary tactics. Due to this information risk, it is possible that the earnings figures disclosed by companies are not reliable. De Simone, Mills, and Stomberg (2019) argue that an MNC's capacity to undertake complex income shifting could produce significant economic uncertainty and exposure to tax risks and volatility in future earnings. These costs could, potentially, increase the firm's probability of restatement. Moreover, tax haven countries are known for their legally mandated secrecy laws and for their lack of informational exchange with regulators and tax authorities from other countries (Leikvang 2012). Secrecy rules may increase managers' capacity to conceal complicated tax avoidance strategies from shareholders (Black, Dikolli and Dyreng 2014; Leikvang 2012) while regulators and tax authorities may be less able to supervise management behaviour due to a lack of information exchange (Desai, Dyck and Zingales 2007). Thereby, managers may make mistakes if accounting complexity is high, which leads to an increase in the possibility of unintentional misstatement or increased manipulation by management, and the increase in inherent risks increases the probability of restatement

Furthermore, quality of information is a significant aspect in financial reporting since the main aim is to transmit relevant information to capital providers and other interested parties. According to information theory, investors need to know about present and future cash flows, together with their market value of assets and liabilities (Watts and Zimmerman 1986). Based on information theory, a strong information environment (that is, high levels of financial

statement transparency) is linked to a higher level of accounting quality by way of limiting managers' opportunistic behaviour, lowering the occurrence of estimation errors and decreasing information asymmetry, which leads to lower restatement.

Given the consequences of income shifting documented in prior research and the possible negative impact on information, financial reporting and transparency, it would be expected that income shifting will lead to higher restatement. As such, my testable hypothesis in the alternate form can be stated as follows:

H1: There is a positive association between a MNC's level of income shifting and the likelihood of financial restatements.

3.2.3.1. The moderating effect of tax havens

It is a well-known fact that tax haven subsidiaries are an important factor in reducing the amount of corporate taxes paid by MNCs (Desai, Foley and Hines Jr 2006a, 2006b; Dyreng and Lindsey 2009). According to Zucman (2014), 55 per cent of US firms' foreign profits are held in tax havens. As reported by the Tax Justice Network (TJN),[5] approximately 25 per cent of US firms' global profits shifting of activities occurs outside of jurisdictions where real economic activity occurs. Consequently, around $130 billion of global revenue is lost a year (Cobham and Janský 2018). MNCs' profits can be shifted from high-tax to low-tax jurisdictions through tax havens. They offer extremely low (often zero) tax rates on corporate profits for non-resident companies, as well as a high degree of secrecy regarding information exchange that could be used by revenue authorities to increase tax both in the home country and abroad. A firm's tax haven network is likely to be more complex and secretive the more subsidiaries it has (Atwood and Lewellen 2019).

[5]For more information, see: https://taxjustice.net/reports/

Tax havens are widely known for their legal secrecy laws and for not sharing information with other regulators or tax authorities in other nations (Leikvang 2012). Thus, managers may be able to hide complex tax avoidance strategies from shareholders under secrecy laws (Black, Dikolli and Dyreng 2014; Leikvang 2012). As a result of a lack of information exchange, regulators and tax authorities may be unable to act as additional monitors of managers' behaviour (El Ghoul, Guedhami and Pittman 2011). A corporation's parent entity became its "legal" domicile when it incorporated itself in a tax haven country (Desai and Dharmapala 2009). Thus, secrecy laws apply to all the parent company's business activities, which may cause a lack of transparency for the group as a whole and allow managers to better disguise corporate resource diversion from shareholders. Additionally, tax haven incorporation might provide multinational firms with opportunities to avoid taxes that are not available to them otherwise. It is possible that companies using tax haven subsidiaries face significant risks, such as risks pertaining to information asymmetry, agency, and transparency. These risks result in a higher probability of restatements. This hypothesis is stated as:

H2a: Tax haven use moderates the relationship between income shifting and the likelihood of financial restatements.

3.2.3.2. The moderating effect of research and development

Research and Development (R&D) for intangible assets provides for another tax avoidance strategy. Since any future benefits are not yet clearly apparent, the IRS allows companies to expense R&D costs immediately during the researching phase, also known as the "exploration phase". The provision in the tax code allows companies to shift expenses to high-tax jurisdictions, thereby minimizing their tax bill (Barker, Asare and Brickman 2017).

Assume that a drug's R&D cost was $100 million and the domestic corporate tax rate is 35%. The company will have a tax saving of $35 million since R&D costs are expensed in

the year incurred for tax purposes. Rather than start to earn money and pay taxes on that income as soon as the exploration phase is completed, the company licenses the drug to an affiliate located in Ireland, a country with a 12.5% corporate tax rate. Consider that the transfer price (ROYALTY) paid by the US company to the Ireland affiliate is set at 3%, and the Ireland affiliate makes $500 million in sales from the drug, only $15 million in income will be reported and taxed in the US, a loss of tens of millions of dollars in tax revenues (Barker, Asare and Brickman 2017).

Also, some domestic companies are eligible for a tax credit during the R&D phase in the US. In many instances, these allowances lower taxable income and create a very low or even negative effective tax rate for the corporation. The US has a more favourable tax system during the development stage than most other countries. I then formulate my hypothesis:

H2b: The level of research and development moderates the relationship between income shifting and the likelihood of financial restatements.

3.2.3.3. The moderating effect of accruals quality

According to Shin and Oh (2017), accruals are the difference between reported earnings and cash flows from operations. The shareholders expect the manager to maximize profits by minimizing tax liabilities to the extent that the benefits outweigh the costs. Managers can use tax avoidance activities to conduct earnings management (Putri, Rohman and Chariri 2016). Desai, Dyck, and Zingales (2007) argue that an opportunistic manager designs complex business strategies for reducing corporate taxes while diverting company resources for personal use. Tax avoidance typically involves managers in activities that harm shareholders by developing complex and secret structures and transactions (Crocker and Slemrod 2005). The asymmetry information between those two, causes managers to have high chances of doing malfeasance – for example, in the choices of accounting method and policies to avoid taxes.

Moreover, a number of studies indicate that earnings management from the perspective of tax can use account deferred tax expense (Holland and Jackson 2004; Noor and Aziz 2007; Phillips, Pincus and Rego 2003). Earnings management is performed using accruals numbers, such as discretionary accruals, which do not directly impact cash flows, for preparation of financial statements based on a variety of different accounting methods (Putri, Rohman and Chariri 2016). However, having a high accruals quality reduces the information asymmetry between firms and market participants, reducing firm information risks (Watts and Zimmerman 1990). High accruals quality is associated with low information asymmetry, according to previous empirical evidence (Cho and Jo 2010; Ecker et al. 2006; Shin and Oh 2017).

Another area of research focuses on the earnings quality of firms in restatement years. According to Desai, Krishnamurthy, and Venkataraman (2006) there is extreme accruals in restatement years. Herly, Bartholdy, and Thinggaard (2020) argue that in the restatement years, firms have poor accruals quality. Thus, accruals quality may work as a mechanism in reducing the negative effect of income shifting on restatement.

H2c: Accruals quality moderates the relationship between income shifting and the likelihood of financial restatements.

3.3 Methodology and Research Design

3.3.1 Sample Selection

The initial sample consists of a randomly stratified sample of listed non-financial US MNCs over the 2006–2019 period. The initial sample comprised 3,650 firm-year observations. The sample was then reduced to 2,972 firm-year observations after removing firm-year observations with missing control variables and income-shifting data (678).

MNCs are more likely to disclose information about income shifting in their annual report than purely domestic corporations (Dyreng and Lindsey 2009; Klassen and Laplante

2012). Financial data are collected from Compustat. Financial data not available from Compustat (e.g. income-shifting data) were hand-collected from 10-K annual reports. Finally, restatement data were obtained from the Audit Analytics database. Scholz (2008) notes that the Audit Analytics database contains nearly all the restatements that can be found in the GAO database and through Lexis-Nexis. The Audit Analytics Non-Reliance database contains detailed information of firms' restatements that were reported due to fraud or clerical errors. A summary of my sample selection is presented in Table 3.1. The data are winzorized at the 1st and 99th percentiles to decrease the probability that outliers affect the results.

Table 3.1 Sample Selection

Total number of firm-year observations (2006–2019)	3,650
Less: Missing control variables	339
Less: firms with missing income shifting data	339
Final sample	2,972

3.3.2 Variable Description

3.3.2.1. Dependent Variable

The dependent variable is restatement. Following prior research (Albring et al. 2013; Herly, Bartholdy and Thinggaard 2020), this study used dummy variable to measure restatement. A dummy variable that takes a value of 1 if the firms announce a restatement in year $_t$, 0 otherwise.

3.3.2.2. Independent Variable

The independent variable is income shifting (INCS). However, this study follows Richardson et al. (2021), who developed a unique measure of income shifting based on differences in group domestic-to-foreign tax rate differentials, reported in accounting income-to-taxable income reconciliations in an MNC's 10-K annual reports. They define their measure of INCS as the fractional reduction in the US statutory tax rate (STR) due to lower (weighted average) foreign tax rates relative to the US STR. Large negative adjustments to prima facie income tax expense on accounting income show that a MNC has the capacity to move income or to allocate income

to jurisdictions that have much lower corporate tax rates. Thus, INCS measures the weighted average tax effect of foreign income being taxed at different (generally lower) tax rates in offshore jurisdictions than the equivalent amount of income would be taxed at in the US.

3.3.2.3. Moderation Variables

This study employs three moderating variables. The first one is tax haven *(THAV)*, which is measured as a dummy variable that equals 1 if the firm has at least one subsidiary company incorporated in an OECD (2006) listed tax haven and, 0 otherwise. The second moderating variable is research and development *(R&D)*, measured as research and development expenditure scaled by total assets. The third one is accruals quality *(AQ)*, measured based on the model proposed by Jones (1990) which accounted for the firm's changing economic circumstances in explaining total accruals.

$$TA_{it}/A_{it-1} = \alpha 1[1/A_{it-1}] + \alpha 2[\Delta REV_{it}/A_{it-1}] + \alpha 3[PPE_{it}/A_{it-1}] + e_{it}$$

Where ΔREV_{it} is the change in revenue for firm i from time $_{t-1}$, A_{it-1} refers to lagged total assets, and PPE_{it} denotes gross property, plant, and equipment for firm *i* in time *t*.

The model includes PPE and ΔREV to control for changes in non-discretionary accruals caused by the firm's changing macro-economic circumstances. Changes in revenue can serve as an objective proxy for shifting economic conditions, while gross property, plant, and equipment captures the effect of non-discretionary depreciation expenses on total accruals. All the variables are scaled by lagged total assets (A_{it-1}) to control for heteroskedasticity (see (Jones, Krishnan and Melendrez 2006; Kothari, Leone and Wasley 2005; Liu and Lu 2007).

3.3.2.4. Control Variables

The regression model includes several control variables that consider the effects of other factors on the restatement following the previous literature (Albring et al. 2013; Herly, Bartholdy and

Thinggaard 2020; Kohlbeck and Mayhew 2017), such as *(SIZE)*. The probability of a restatement is greater for larger firms as these clients typically have more complex accounting. However, large firms often have more developed accounting systems, which should reduce the number of restatements. As a result, I make no prediction for size. *SIZE* is a firm's market-to-book ratio, calculated as the ratio of the market value of equity scaled by the book value of equity. Higher levered firms *(LEV)* and growth firms *(GROWTH)* are expected to have increased risk of restatements (Francis, Michas and Yu 2013). Clients experiencing other problems, such as lower profits *(ROA)* or reporting a loss *(LOSS)*, are also expected to have a greater chance of a restatement. The probability of restatement is also greater for clients involved in mergers and acquisitions *(MERGER)*. In addition, I compute earnings-to-price ratio *(EPR)*, defined as net income scaled by market capitalization at the end of the year. I compute *(BIG4)* as a dummy variable that takes a value of 1 if the client is audited by one of the Big 4 accounting firms, zero otherwise. *(BD)* is calculated as the natural logarithm of the total number of board members. While the *(BUSY)* natural logarithm of total number of external board directorships. In all my regressions, I control for the fixed effects of industry and year. Definitions of all control variables are in Appendix A.

3.3.3 Regression Model

The regression model, which examines the association between income shifting and restatement, is estimated as follows:

$$REST_{it} = a0_{it} + \beta_1 INCS_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 ROA_{it} + \beta_5 SALEG_{it} + \beta_6 LOSS_{it} + \beta_7 EPR_{it} + \beta_8 MERGER_{it} + \beta_9 BD_{it} + \beta_{10} BUSY_{it} + \beta_{11} BIG4_{it} + \varepsilon_{it} \quad \text{Equation (1)}$$

where *i* = denotes a firm MNCs, *t* = financial years 2006–2019, REST = restatement, INCS = the fractional reduction in the US STR due to lower (weighted average) foreign tax rates

relative to the US STR, CONTROLS = a vector of control variables, and ε = the error term. Finally, Appendix A provides the variable definitions and measurement details for all variables.

3.3.3.4 Subsample analysis

Subsample analysis is now undertaken to examine several possible channels through which income shifting affects restatement. In particular, it examines the moderation effects of tax havens, research and development, and accruals quality, respectively. For the moderation effects of tax havens, this essay classifies MNCs as having a tax haven (TH=1) or not (TH=0). For the moderation effects of research and development, it classifies MNCs as having high (low) research and development attributes if they are above (below) the median of their respective distributions. Finally, for the moderation effects of accruals quality, it classifies MNCs as having high (low) accruals quality attributes if they are above (below) the median of their respective distributions.

The model for testing H2a is estimated as follows:

$$REST_{it} = a0_{it} + \beta_1 INCS_{it} + \beta_2 THAV_{it} + \beta_3 INCS_{it} * THAV_{it} + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 ROA_{it} + \beta_7 SALEG_{it} + \beta_8 LOSS_{it} + \beta_9 EPR_{it} + \beta_{10} MERGER_{it} + \beta_{11} BD_{it} + \beta_{12} BUSY_{it} + \beta_{13} BIG4_{it} + \varepsilon_{it}$$

Equation (2)

where *THAV*= tax haven.

The model for testing H2b is estimated as follows:

$$REST_{it} = a0_{it} + \beta_1 INCS_{it} + \beta_2 R\&D_{it} + \beta_3 INCS_{it} * R\&D_{it} + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 ROA_{it} + \beta_7 SALEG_{it} + \beta_8 LOSS_{it} + \beta_9 EPR_{it} + \beta_{10} MERGER_{it} + \beta_{11} BD_{it} + \beta_{12} BUSY_{it} + \beta_{13} BIG4_{it} + \varepsilon_{it}$$

Equation (3)

where *R&D* = research and development.

The model for testing H2c is estimated as follows:

$$REST_{it} = a0_{it} + \beta_1 INCS_{it} + \beta_2 AQ_{it} + \beta_3 INCS_{it} * AQ_{it} + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 ROA_{it} + \beta_7 SALEG_{it} + \beta_8 LOSS_{it} + \beta_9 EPR_{it} + \beta_{10} MERGER_{it} + \beta_{11} BD_{it} + \beta_{12} BUSY_{it} + \beta_{13} BIG4_{it} + \varepsilon_{it}$$

Equation (4)

where *AQ* = accruals quality.

3.4 Empirical Results

3.4.1 Summary Statistics

Table 3.2 presents the descriptive statistics of the variables used in the regression model for the restatement measures (REST). Continuous variables are winsorized at the 1% and 99% levels to minimize the effects of outliers. The mean (median) of the dependent variable, (REST) is 0.061 (0). In addition, I find that the mean (median) value for INCS is -8.322 (-.36) with a standard deviation of 33.107 and the mean (median) value for INCS_ln is 0.192 (0) with a standard deviation of 1.197. In terms of economic significance, on average, a one-standard deviation increase in income shifting is associated with an increase in the restatement of about 0.9%. Finally, the mean (median) values of the control variables are similar to those reported in the previous literature (Albring et al. 2013; Herly, Bartholdy and Thinggaard 2020; Kohlbeck and Mayhew 2017).

Table 3.2 Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
REST	2972	0.061	0.239	0.000	1.000
INCS	2972	-8.322	33.107	-182	125.71
INCS_ln	2972	0.192	1.197	-4.605	4.834
LEV	2737	0.272	0.191	0.000	1.012
ROA	2700	0.105	0.082	-0.13	0.339
SALEG	2741	0.047	0.168	-0.437	0.741
LOSS	2972	0.137	0.344	0.000	1.000
SIZE	2736	0.442	0.325	-0.15	1.814
EPR	2736	0.038	0.091	-0.492	0.246
MERGER	2972	0.782	0.413	0.000	1.000
BD	2956	2.588	0.334	1.099	3.829
BUSY	2956	3.575	0.615	0.693	4.97
BIG4	2972	0.75	0.433	0.000	1.000

This table shows the descriptive statistics of all variables used in the analysis. The variables are defined in Appendix A.

3.4.2 Correlation Analysis

The Pearson correlation coefficients for the explanatory variables are reported in Table 3.3. As expected, it is observed that the dependent variable *(REST)* is correlated significantly and positively with the independent variable *INCS* at p<0.01. These results support H1, indicating that *INCS* is positively related to restatement. In addition, the control variables (*SIZE, LEV*, *ROA, SALEG, LOSS, EPR, MERGER, BD, BUSY, BIG4*) are also correlated significantly to the dependent variable, restatement, at p <0.01. Generally, the correlations are as expected, providing strong support in validating my main constructs and measures.

Table 3.3 Pearson Correlation

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) REST	1.000												
(2) INCS	0.061	1.000											
(3) INCS_ln	0.040	0.412	1.000										
(4) LEV	0.052	0.021	0.059	1.000									
(5) ROA	-0.055	-0.017	-0.012	-0.100	1.000								
(6) SALEG	-0.007	0.001	0.001	0.084	0.338	1.000							
(7) LOSS	0.041	0.016	0.074	0.043	-0.508	-0.195	1.000						
(8) SIZE	0.042	-0.009	0.010	-0.176	-0.339	-0.027	0.152	1.000					
(9) EPR	-0.050	-0.029	-0.004	-0.019	0.463	0.226	-0.694	-0.034	1.000				
(10) MERGER	0.040	-0.030	0.002	0.161	0.002	0.021	-0.065	-0.155	0.044	1.000			
(11) BD	-0.014	-0.037	-0.051	0.146	0.162	0.006	-0.112	-0.219	0.116	-0.078	1.000		
(12) BUSY	0.031	-0.033	-0.051	0.096	0.096	-0.000	-0.087	-0.219	0.098	0.025	0.685	1.000	
(13) BIG4	0.030	0.018	-0.029	0.056	-0.109	-0.017	0.042	0.000	-0.017	0.034	0.035	0.036	1.000

Variable definitions are reported in Appendix 3.1. *, **, *** correspond to 1%, 5% and 10% levels of significance, respectively. The *p*-values are based on two-tailed tests.

3.4.3 Regression Results

The regression results obtained from the examination of the relationship between income shifting and restatement are shown in Table 2. In Table 3.4, *INCS* and *INCS_ln* are used for income shifting, the dependent variable in Column (1) and (2) is probit-Rest, whereas the dependent variables in Columns (3) and (4) are logit-Rest. As evidenced in Column (1) and (2)of Table 2, the coefficient of the *INCS* and *INCS_ln* variables are 0.005 and 0.079, respectivelywith p-value < 0.01, signifying that the income shifting is associated positively with restatement. In other words, firms having higher levels of income shifting show a greater propensity for restatement. Similar results are observed in Columns (3) and (4), where the coefficients of *INCS* and *INCS_ln* are significantly positively related with a p-value < 0.01, for logit-Rest. In terms of economic significance, increasing the income shifting *(INCS)* by 1% increases firm restatement by.9 %. This result supports the first hypothesis H1 that there is a positive correlation between income shifting and restatement which consistent with prior studies. For example, Balakrishnan, Blouin, and Guay (2019) provide evidence that tax-aggressive firms areless financially transparent and have greater information asymmetry. Moreover,Durnev, Li, and Magnan (2017) claim that companies operating in offshore financial centres have lower financial reporting quality (higher accruals-based and real earnings management) than similar companies without offshore operations. Kim et al. (2011) add that managers mightclaim that the more complex and opaque a tax transaction is, the less chance they have of beingcaught by tax authorities. Therefore, the increase in information asymmetry and less transparency increases the likelihood of accounting restatements. For the control variables, the coefficient estimates are consistent with prior studies (Albring et al. 2013; Herly, Bartholdy and Thinggaard 2020; Kohlbeck and Mayhew 2017).

Table 3.4 Regression Results: Association between Income Shifting and Financial Restatement (H1).

	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**
Dependent variable: REST	*Probit*	*Probit*	*Logit*	*Logit*
INCS	**0.005*** **		**0.009*** **	
	3.76		**3.51**	
INCS_ln		**0.079** **		**0.153** **
		2.43		**2.22**
LEV	0.583**	0.588**	1.230**	1.220**
	2.45	2.5	2.55	2.56
ROA	-0.273	-0.399	-0.882	-1.068
	(-0.40)	(-0.58)	(-0.62)	(-0.73)
SALEG	-0.083	-0.049	-0.142	-0.078
	(-0.31)	(-0.18)	(-0.26)	(-0.14)
LOSS	0.04	0.01	0.027	-0.007
	0.24	0.06	0.08	(-0.02)
SIZE	0.390***	0.343**	0.713**	0.636**
	2.77	2.5	2.43	2.25
EPR	-1.039*	-1.127*	-2.152*	-2.364**
	(-1.78)	(-1.90)	(-1.83)	(-1.97)
MERGER	0.265**	0.248*	0.566**	0.534*
	2.02	1.91	2.03	1.93
BD	-0.076	-0.086	-0.178	-0.162
	(-0.36)	(-0.41)	(-0.39)	(-0.36)
BUSY	0.008	0.024	0.024	0.024
	(-0.06)	0.2	(-0.09)	0.09
BIG4	0.290**	0.305***	0.601**	0.624***
	2.54	2.68	2.52	2.6
Constant	-2.788***	-2.745***	-5.365***	-5.290***
	(-5.19)	(-5.16)	(-4.47)	(-4.46)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
N	2523	2523	2523	2523
Adj. R-sq	0.1014	0.0941	0.1014	0.0945

The table presents the probit and logit regression results on the effect of income shifting on restatement. The dependent variable is REST defined as A dummy variable that takes a value of 1 if the firms announce a restatement in year $_t$, 0 otherwise. The variable of interest is INCS defined as Fractional reduction in the US statutory tax rate (STR) due to lower (weighted average) foreign tax rates. I use INCS winsorize and INCS_In the natural logarithm. Variable definitions are described in Appendix A. Coefficient estimates are reported with t-statistics in parentheses. Statistically significant of the estimates are denoted with asterisks: ***, **and* correspond to 1%, 5% and 10% levels of significance, respectively. The p-values are one-tailed for directional hypotheses and two-tailed otherwise.

3.4.4 Moderation Results

Moderation is the question of whether the impact of some independent variable on the dependent variable varies in magnitude as a function of some third variable (Judd, Yzerbyt and Muller 2014). Therefore, in this section, I test the moderation effects of three variables, i.e. tax haven, research and development, and accruals quality, on the relationship between income shifting and restatement. In the next section, I will discuss the moderation variables in more detail.

3.4.4.1 The moderating effect of tax haven – H2

Table 3.5 presents the moderation test of tax haven on the relation between income shifting and restatement. The coefficients of income shifting *(INCS and INCS_ln)* in Columns (1), (3),(5), and (7) are positively and statistically significant with restatement *(REST)* for the existingof tax haven TH=1 subsample ($p < 0.01$), but it is not significant across all of the regression models for no existing of tax haven TH=0 subsample. This implies that existence of tax haven countries increases the likelihood of accounting restatements. In other words, firms that engage in income-shifting activities via tax haven will lead to more restatement. This result is consistent with my conjecture that a tax haven provides multinational firms with opportunities to avoid taxes that are not available to them otherwise. There are a number of features that make tax havens attractive to MNCs, including secrecy in banking practices, weak regulations, and a zero tax rate, so MNCs can retain money offshore and engage in earnings management and income-shifting activities (De Simone, Klassen and Seidman 2019; Desai, Foley and Hines Jr 2006b). In addition, tax havens are usually known to be locations for earnings management and financial misstatements (Manry, Mock and Turner 2007). Therefore, it is possible that companies that use tax haven subsidiaries face significant risks, such as information asymmetry, agency costs and lack of transparency. The possibility of secrecy laws increases

managers' ability to hide complex tax avoidance strategies from shareholders (Black, Dikolli and Dyreng 2014; Leikvang 2012); in addition, regulators and tax authorities may not be able to act as additional monitors of manager behaviour due to poor information exchange (El Ghoul, Guedhami and Pittman 2011). As a result, the likelihood of financial restatements arises. This finding suggests that the tax haven plays an important role in moderating the effect of income shifting on restatement.

Table 3.5 Regression Results – Subsample Analysis of tax haven (THAV)

Dependent variable: REST	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Probit	Probit	Probit	Probit	Logit	Logit	Logit	Logit
	TH=1	TH=0	TH=1	TH=0	TH=1	TH=0	TH=1	TH=0
INCS	**0.006*** **	**0.004**			**0.010*** **	**0.007**		
	(4.21)	**(1.20)**			**(3.72)**	**(1.06)**		
INCS_ln			**0.088** **	**0.015**			**0.164** **	**0.022**
			(2.28)	**(0.15)**			**(1.98)**	**(0.09)**
LEV	0.784***	0.958*	0.770***	-0.851*	1.476***	-1.853*	1.442***	-1.637*
	(2.87)	(-1.89)	-2.87	(-1.74)	-2.66	(-1.81)	(2.64)	(-1.65)
ROA	-0.319	0.475	-0.418	0.434	-1.027	1.171	-1.071	1.340
	(-0.39)	(0.27)	(-0.51)	-0.25	(-0.60)	(0.32)	(-0.63)	(0.35)
SALEG	0.095	-1.212	0.118	-1.148	0.287	-2.098	0.334	-1.898
	(0.31)	(-1.63)	-0.39	(-1.57)	-0.47	(1.43)	(0.56)	(-1.30)
LOSS	-0.112	0.269	-0.112	0.213	-0.241	0.635	-0.225	0.534
	(-0.59)	(0.72)	(-0.60)	-0.57	(-0.62)	(0.86)	(-0.59)	(0.73)
SIZE	0.409***	0.707	0.391***	0.623	0.730**	1.363	0.702**	1.255
	(2.71)	(1.54)	-2.63	-1.38	-2.41	(1.27)	(2.35)	(1.23)
EPR	-1.379**	-0.440	-1.433**	-0.49	-2.706**	-1.051	02.851**	-1.324
	(-2.04)	(-0.27)	(-2.09)	(-0.30)	(-1.97)	(-0.30)	(-2.04)	(-0.41)
MERGER	0.288**	0.022	0.274*	0.01	0.571*	0.036	0.539*	0.008
	(2.00)	(0.05)	-1.93	-0.02	-1.89	(0.03)	(1.82)	(0.01)
BD	0.316	-1.161***	0.306	-1.091***	0.498	0.215**	0.497	-2.022**
	(1.26)	(-2.70)	-1.23	(-2.65)	-0.91	(-2.42)	(0.92)	(-2.33)
BUSY	-0.131	0.462	-0.084	0.436	-0.258	0.977	-0.168	0.867
	(-0.93)	(1.62)	(-0.62)	-1.61	(-0.85)	(1.51)	(-0.58)	(1.47)
BIG4	0.352***	-0.071	0.361***	-0.051	0.729**	-0.240	0.748**	0.231
	(2.58)	(-0.22)	-2.67	(-0.16)	-2.52	(-034)	(2.57)	(-0.31)
Constant	-4.133***	-0.127	-4.075***	-0.17	-8.125***	-0.148	-8.020***	-0.344
	(-5.95)	(-0.10)	(-6.04)	(-0.13)	(-5.13)	(-0.05)	(-5.14)	(-0.11)
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1983	340	1983	340	1983	340	1983	340
adj. R-sq	0.1222	0.1968	0.1135	0.1898	0.1203	0.2025	0.1126	0.1951

The table presents the probit and logit regression results on the subsample analysis of tax haven (**THAV**). TH=1 means existing of tax haven. The dependent variable is REST defined as A dummy variable that takes a value of 1 if the firms announce a restatement in year $_t$, 0 otherwise. The variable of interest is INCS defined as Fractional reduction in the US statutory tax rate (STR) due to lower (weighted average) foreign tax rates. I use INCS winsorize and INCS_In the natural logarithm. Variable definitions are described in Appendix A. Coefficient estimates are reported with t-statistics in parentheses. Statistically significant of the estimates are denoted with asterisks: ***, **and* correspond to 1%, 5% and 10% levels of significance, respectively. The p-values are one-tailed for directional hypotheses and two-tailed otherwise.

3.4.4.2 The moderating effect of research and development -H3

Next, the study empirically tests whether the positive association between income shifting (INCS) and the restatement (REST) is moderated with research and development (R&D). Table 3.6 presents the panel regression results for each research and development (R&D) subsample. The study finds that the positive and significant association between income shifting and restatement is moderated with research and development, so H3 is supported by the results.

Table 3.6 Regression Results – Subsample Analysis of research and development (R&D)

	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**
Dependent variable: REST	*Probit*	*Probit*	*Logit*	*Logit*
	R&D (above median)	R&D (below median)	R&D (above median)	R&D (below median)
INCS	**0.006*** **	**0.005** **		
	3.38	**2.11**		
INCS_ln			**0.105** **	**0.125** **
			2.44	**2.03**
LEV	0.520*	0.890*	0.563**	0.853*
	1.84	1.67	0.2	1.69
ROA	-0.588	-2.595*	-0.754	-2.531*
	(-0.76)	(-1.68)	(-0.97)	(-1.71)
SALEG	0.358	-1.008*	0.369	-0.938*
	1.22	(-1.78)	1.28	(-1.65)
LOSS	0.257	-0.715**	0.208	-0.760**
	1.26	(-2.29)	1.02	(-2.44)
SIZE	0.447**	0.447*	0.383**	0.382
	2.49	1.65	2.19	1.46
EPR	0.505	-2.825***	0.528	-3.233***
	0.7	(-2.79)	0.72	(-3.10)
MERGER	0.212	0.558**	0.185	0.537**
	1.28	2.39	1.13	2.34
BD	0.109	-0.182	0.036	-0.052
	0.43	(-0.43)	0.14	(-0.13)
BUSY	-0.188	0.202	-0.13	0.173
	(-1.31)	-0.71	(-0.96)	0.61
BIG4	0.208	0.177	0.218	0.198
	1.38	0.77	1.46	0.85
Constant	-1.649**	-2.514***	-1.510**	-2.722***
	(-2.37)	(-2.68)	(-2.20)	(-2.90)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
N	1661	685	1661	685
adj. R-sq	0.1153	0.1940	0.1071	0.1920

The table presents the probit and logit regression results on the subsample analysis of research and development (R_D) above and below median. The dependent variable is REST defined as A dummy variable that takes a value of 1 if the firms announce a restatement in year $_t$, 0 otherwise. The variable of interest is INCS defined as Fractional reduction in the US statutory tax rate (STR) due to lower (weighted average) foreign tax rates. I use INCS winsorize and INCS_In the natural logarithm. Variable definitions are described in Appendix A. Coefficient estimates are reported with t-statistics in parentheses. Statistically significant of the estimates are denoted with asterisks: ***, **and* correspond to 1%, 5% and 10% levels of significance, respectively. The p-values are one-tailed for directional hypotheses and two-tailed otherwise.

3.4.4.3 The moderating effect of accruals quality - H4

Finally, the study empirically tests whether the positive association between income shifting (INCS) and the restatement (REST) is moderated with accruals quality. Table 3.7 presents the panel regression results for each accruals quality subsample. I find there is a positive and significant association between income shifting and restatement across all of the regression models for the low AQ subsample ($p < 0.01$), but it is not significant in the high AQ subsample, which means the better accruals quality firms have, the less restatement. High accruals quality is associated with low information asymmetry, according to previous empirical evidence (Cho and Jo 2010; Ecker et al. 2006; Shin and Oh 2017). These findings imply that accruals quality works as a mechanism in reducing the negative effect of income shifting on restatement.

Table 3.7 Regression Results – Subsample Analysis of accruals quality (AQ)

Dependent variable: REST	**Model (1)**	**Model (2)**	**Model (3)**	**Model (4)**
	Probit	*Probit*	*Logit*	*Logit*
	AQ (above median)	AQ (below median)	AQ (above median)	AQ (below median)
INCS	**0.003***	**0.005*****		
	(1.8)	**(2.88)**		
INCS_ln			**0.011**	**0.117*****
			(0.21)	**(2.67)**
LEV	0.268	0.858***	0.226	0.878***
	(0.7)	(2.67)	(0.6)	(2.76)
ROA	-1.525	-0.416	-1.559	-0.443
	(-1.52)	(-0.38)	(-1.57)	(-0.41)
SALEG	0.167	-0.136	0.126	-0.081
	(0.43)	(-0.38)	(0.33)	(-0.23)
LOSS	0.213	-0.071	0.214	-0.101
	(0.64)	(-0.37)	(0.64)	(-0.52)
SIZE	-0.230	0.603***	-0.261	0.560***
	(-0.80)	(3.4)	(-0.94)	(3.25)
EPR	0.819	-1.508**	0.917	-1.744**
	(0.68)	(-2.12)	(0.75)	(-2.37)
MERGER	0.279	0.285	0.264	0.281
	(1.36)	(1.55)	(1.3)	(1.53)
BD	0.382	-0.315	0.396	-0.321
	(1.13)	(-1.03)	(1.19)	(-1.06)
BUSY	-0.079	-0.057	-0.068	-0.023
	(-0.50)	(-0.27)	(-0.44)	(-0.11)
BIG4	0.160	0.266*	0.157	0.304*
	(0.92)	(1.65)	(0.9)	(1.87)
Constant	-2.854***	-2.586***	-2.773***	-2.627***
	(-3.40)	(-3.25)	(-3.31)	(-3.36)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
N	1098	1216	1098	1216
adj. R-sq	0.1053	0.1532	0.1022	0.1488

The table presents the probit and logit regression results on the subsample analysis of accruals quality (AQ) above and below median. The dependent variable is REST defined as A dummy variable that takes a value of 1 if the firms announce a restatement in year $_t$, 0 otherwise. The variable of interest is INCS defined as Fractional reduction in the US statutory tax rate (STR) due to lower (weighted average) foreign tax rates. I use INCS winsorize and INCS_ln the natural logarithm. Variable definitions are described in Appendix A. Coefficient estimates are reported with t-statistics in parentheses. Statistically significant of the estimates are denoted with asterisks: ***, **and* correspond to 1%, 5% and 10% levels of significance, respectively. The p-values are one-tailed for directional hypotheses and two-tailed otherwise.

3.5 Additional Analysis

In this section, I conduct additional analyses in order to demonstrate that the previously reported results are robust.

3.5.1. Additional Control Variables

I include some additional control variables in the main regression, such as *AUDF*, *AUDI*, fee variables, , which represent the economic bonding as larger audit clients possess more leverage in negotiating with auditors (Newton, Wang and Wilkins 2013) and are expected to be positively related to the likelihood of a restatement. *REC*, *QUICK*, and *LIT*. industry variables include industry litigation risk *(LIT)*, which is expected to have a greater likelihood of restatement. In the analysis of Table 3.8, I observed that the main results remain robust ($p<.01$) for REST after controlling for additional variables.

Table 3.8 Regression Results – Additional control variables

Dependent variable: REST	**Model (1)**	**Model (2)**	**Model (3)**	**Model (4)**
	Probit	*Probit*	*Logit*	*Logit*
INCS	**0.005*** **		**0.009*** **	
	(3.35)		**(2.9)**	
INCS_ln		**0.078** **		**0.140***
		(2.25)		**(1.91)**
LEV	0.564**	0.588**	1.195**	1.231**
	(2.16)	(2.28)	(2.28)	(2.37)
ROA	-0.391	-0.473	-1.003	-1.157
	(-0.51)	(-0.61)	(-0.63)	(-0.72)
SALEG	0.016	0.046	0.046	0.105
	(0.06)	(0.16)	(0.08)	(0.18)
LOSS	0.082	0.046	0.097	0.049
	(0.48)	(0.27)	(0.27)	(0.14)
SIZE	0.455***	0.420***	0.851**	0.786**
	(2.89)	(2.73)	(2.56)	(2.48)
EPR	-1.036*	-1.147*	-2.150*	-2.381*
	(-1.67)	(-1.83)	(-1.73)	(-1.89)
MERGER	0.253*	0.237*	0.497*	0.467
	(1.86)	(1.76)	(1.71)	(1.63)
BD	-0.103	-0.12	-0.171	-0.169
	(-0.45)	(-0.53)	(-0.34)	(-0.34)
BUSY	0.013	0.039	-0.017	0.013
	(0.09)	(0.28)	(-0.05)	(0.04)
BIG4	0.146	0.165	0.319	0.335
	(1.11)	(1.26)	(1.15)	(1.21)
AUDF	0.187	0.191	0.3	0.329
	(0.91)	(0.93)	(0.71)	(0.78)
AUDI	0.56	0.409	0.709	0.59
	(0.49)	(0.36)	(0.3)	(0.26)
REC				
	1.651**	1.774**	3.380**	3.650**
	(2.34)	(2.51)	(2.27)	(2.44)
QUICK	-0.017	-0.016	-0.028	-0.023
	(-0.37)	(-0.35)	(-0.28)	(-0.23)
LIT	-0.703***	-0.696***	-1.345***	-1.355***
	(-3.46)	(-3.40)	(-3.22)	(-3.20)
Constant	-6.563*	-6.624*	-11.815	-12.263
	(-1.80)	(-1.82)	(-1.56)	(-1.62)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
N	2277	2277	2277	2277
adj. R-sq	0.1207	0.1143	0.1199	0.1143

***, **, and * represent statistical significance at the 1%, 5%, and 10% level respectively (two-tailed test).

3.6. Endogeneity test: Generalized method of moments (GMM) estimator

To control for potential endogeneity, this study uses two methods to estimate the main model, i.e. Arellano and Bond (1991) referred to as the difference GMM and Arellano and Bover (1995) and Blundell and Bond (1998) referred as system GMM estimation. Arellano and Bond (1991) suggest that GMM estimation is better specified to address concerns over endogeneity and omitted variable bias, in addition to unobserved panel heterogeneity. This approach transforms my control variables into instruments, which makes them uncorrelated (exogenous). This mitigates potential endogeneity concerns (Arellano & Bover 1995). System GMMrequires the additional assumption that the differences used as instruments are uncorrelated with the error term (with the unobserved unit-specific effects). A sufficient condition for this to hold would be joint mean stationarity of the dependent variable and the independent variables, which may not be easily justifiable in many applications.

An alternative would be the difference GMM estimator augmented by the Ahn–Schmidt non-linear moment conditions. This estimator has better properties than the difference GMM estimator under high persistence but does not require the additional mean-stationarity assumption of the system GMM estimator (Kripfganz 2019). Table 3.9 reports the results of both the difference GMM and the system GMM for the overall firms. Results for overall firms reveal that both the estimations of difference GMM and system GMM report positive and statistically significant coefficients (Table 3.4) for the lagged variable of restatement.

Table 3.9 GMM Regression Results

Variable	Difference GMM		System GMM	
	Model (1)	**Model (2)**	**Model (1)**	**Model (2)**
L.REST	0.064***	0.070***	-0.104	-0.15
	-7.94	-10.15	(-0.75)	(-0.81)
INCS_ln	**0.009*** **		**0.080** **	
	-4.44		**2.54**	
INCS		**0.001*** **		**0.002***
		-9.19		**1.74**
LEV	-0.029	-0.009	0.016	0.056
	(-1.01)	(-0.31)	0.49	1.62
ROA	-0.09	0.059	0.023	-0.035
	(-1.05)	0.67	0.26	(-0.35)
SALEG	0.054***	0.064***	-0.004	0.005
	5.06	4.47	(-0.12)	-0.15
LOSS	0.027**	0.038***	-0.026	0.007
	2.57	3.55	(-1.11)	0.31
SIZE	0.076***	0.083***	0.049**	0.054**
	6.93	8.59	2.37	2.24
EPR	-0.026	-0.031	-0.164*	-0.084
	(-0.61)	(-0.70)	(-1.65)	(-0.84)
MERGER	0.047***	0.039***	0.035***	0.035***
	10.67	7.42	3.64	0.3
BD	-0.006	-0.014	-0.011	-0.034
	(-0.36)	(-0.85)	(-0.47)	(-1.19)
BUSY	0.029***	0.030***	0.037***	0.034***
	5.19	5.14	3.43	2.64
BIG4	-0.027***	-0.026**	0.003	0.000
	(-3.37)	(-2.38)	0.22	0.02
Constant	-0.02	-0.183	-0.05	-0.008
	(-0.13)	(-1.04)	(-0.92)	(-0.13)
N	2428	2428	2675	2675

***, **, and * represent statistical significance at the 1%, 5%, and 10% level respectively (two-tailed test)

3.7 Conclusion

This study investigates the association between income shifting and restatements. It also analyses whether the existence of a tax haven, level of research and development expenditure and accruals quality moderates the association between income shifting and restatements. This study finds a positive association between income shifting and accounting restatements. The results are also economically significant. For instance, an increase in the income shifting (INCS) variable by 1% increases accounting restatements by 0.9%. Finally, the study also observes that the existence of tax haven, level of research and development, and accruals quality all moderate the positive association between income shifting and restatements.

This study makes several contributions to the literature. First, this is the first study to explore the association between income shifting and the occurrence of financial restatements. The findings show that multinational corporations that use income shifting incur significantly more restatements. Second, this study uses a unique hand-collected data set on income shifting. Third, this study also explores for the first time the moderation effect of tax havens, research and development, and accruals quality on this relationship. The study offers new evidence showing that tax havens, research and development, and accruals quality all moderate the positive association between income shifting and restatements. Finally, the results of this study should be of interest to regulators in auditing, financial reporting, and taxation.

Chapter Four

Non-arm's length transactions, offshore financial centres, transfer pricing agreements and corporate cash holdings: Evidence from U.S. multinational corporations.

4.1 Introduction..... 90
4.2 Background. 93
4.3 Literature review and hypothesis development 95
4.4 Research design 109
4.5 Empirical results 112
4.6 Endogeneity tests 121
4.7 Conclusion. 124

4.1 Introduction

Globalization has created many MNCs, which are characterized by the establishment of branches and subsidiaries in various countries. The main goal of MNCs is to maximize global income by minimizing taxes to affiliated companies that have low or zero taxes through transfer pricing (Leitch and Barrett 1992). As a result, MNCs hold significant amounts of cash in foreign subsidiaries. There are several tax-related scandals involving major corporations such as Google, Amazon, and Starbucks, where tax avoidance techniques such as transfer pricing were used to shift profits to lower-tax jurisdictions (Barford and Holt 2013). Considering the importance of MNCs to the global economy, the amount of cash that MNCs should hold in their overseas subsidiaries has become a pivotal issue in international business. Due to the rapid growth in multinational trade and the opening of several significant developing economies, transfer pricing has recently attracted a high level of international attention as it has an increasing impact on corporate income tax (Rossing, Cools and Rohde 2017). Global tax authorities have raised concern about the loss of tax revenues that may be the result of abusive transfer pricing (Publishing, Co-operation and Development 2012).

In recent years, tax authorities around the world have revised their policies regarding transfer pricing, introducing new penalties, imposing new documentation requirements, expanding information exchange, strengthening audit staff training, and increasing audit and inspection activities (De Mooij and Liu 2020). The United States (US), for example, introduced transfer price regulations in 1992, which included extensive documentation requirements, non-negotiable penalties and aggressive enforcement of regulations (Emmanuel1999). In 2004, US Congress enacted the American Jobs Creation Act (AJCA), which reducedthe tax cost to repatriate foreign earnings for US MNCs and provided an effective exogenous setting for examining tax-induced behaviour in the US (Blouin and Krull 2009; Chen 2014; Clemons and Kinney 2009; Faulkender and Petersen 2012; Graham, Hanlon and Shevlin 2010).

Moreover, MNCs have turned to an advance pricing agreement to reduce their tax risk (Markham 2012). This agreement is a formal agreement between a tax authority and an MNC, in which the parties agree on how the MNC will conduct its transfer pricing, to estimate its taxable income and to pay taxes for a fixed period, which reduces the likelihood of a discrepancy in income taxes (Eden 2015; Markham 2012).

While previous studies assert that transfer prices are used as a mechanism to shift income out of the US, direct evidence on the role of transfer pricing agreement remains controversial (Firmansyah and Yunidar 2020; Richardson, Taylor and Lanis 2013; Taylor, Richardson and Lanis 2015; Wahyudi, Sutrisno and Rusydi 2021; Waworuntu and Hadisaputra 2016). This paper, hence, aims to fill this gap in the literature by investigating the association between transfer pricing and corporate cash holdings of a sample of US MNCs. Using hand-collected data over the 2006–2020 period with 2,686 firm year observations, this study finds a positive association between the existence of non-arm's-length transactions and offshore financial centres and corporate cash holdings. It also documents a negative and significant association between the existence of a transfer pricing agreement and the level of firm cash holdings. Overall, the results suggest that development of a transfer pricing agreement with taxing authorities deters multinational corporations from shifting profits from higher- to lower-tax countries.

This essay contributes to the literature in several important ways. First, to the best of my knowledge, this study is the first to examine the association between transfer pricing and corporate cash holdings. Past research has focused more on transfer pricing aggressiveness and corporate tax avoidance (Firmansyah and Yunidar 2020; Richardson, Taylor and Lanis 2013; Taylor, Richardson and Lanis 2015; Wahyudi, Sutrisno and Rusydi 2021; Waworuntu and Hadisaputra 2016). This study, however, contributes to a new and growing field of research examining the effects of transfer pricing agreements on the level of firm cash holdings. It also

extends prior literature centred on enforcement of transfer pricing regulations by providing insights on the effects of transfer pricing agreements when deterring profit-shifting behaviour through transfer price manipulation by multinational companies.

Second, this study uses unique hand-collected data on firms' transfer pricing agreements with tax authorities over the 2006–2020 period. It documents a positive association between non-arm's-length transactions and corporate cash holdings, indicating transfer pricing manipulation is the primary means by which corporations maximize global profits and minimize taxes. In addition, this study finds that the existence of offshore financial centres increases corporate cash holdings, suggesting that offshore financial centres facilitate income shifting out of the US. Moreover, this study empirically evaluates and finds that the existence of a transfer pricing agreement is negatively related to corporate cash holdings, implying that transfer pricing agreements with tax authorities are an important tool designed to mitigate the negative effects of transfer pricing aggressiveness.

Third, the findings on the relationship between transfer pricing and cash holdings are particularly interesting to investors because cash expropriation has a devastating impact on shareholder wealth. Transfer pricing agreements have the potential to bring real economic benefits to corporations, serving as an efficient mechanism that limits the adverse effects of transfer pricing aggressiveness and creating investment opportunities for corporations.

Fourth, this study also contributes to the literature by informing broader policy about crucial reforms to the US tax system by extending the knowledge of how APAs and the AJCA affects repatriation behaviour and corporate cash holdings. This study finds a negative and significant association between transfer pricing agreements with tax authorities and corporate cash holdings, which indicates that stronger regulations such as APAs and the AJCA will reduce repatriation risk, trapped cash risk and litigation risk. Finally, the results of this study should also be of interest to academics and policymakers in considering the potential

implications of the recent significant reduction in the US corporate tax rate in response to the TCJA and imposition of a quasi-territorial tax system. Moreover, the findings of this study may inform governments to adopt more strict regulations in order to mitigate adverse effects of transfer pricing aggressiveness.

The remainder of this chapter is organized as follows. Section 2 discusses the background of the U.S tax system. Section 3 provides the literature review and develops the hypotheses. Section 4 describes the research design and variable measurement. The results are discussed in Section 5, and Section 6 presents endogeneity tests. Finally, Section 7 concludes the chapter.

4.2 Background

4.2.1 The US Tax System

Prior to 2018, the United States (US) had a worldwide tax system which required all US corporations to be subject to US taxation no matter where their incomes were earned. For example, the income of a US MNC's domestic subsidiaries was subject to US tax immediately, but based on US tax law, foreign subsidiary income was not taxed until the foreign income was returned to the US parent as a dividend or until the subsidiary was sold or liquidated (Atwood et al. 2020). In general, taxes on foreign earnings of US corporations are deferred until the earnings are repatriated. In order to mitigate double taxation, the US grants foreign tax credits for foreign taxes paid. As a result, taxes on repatriation on foreign corporations with tax rates below the US tax rate are generally equal to the difference between the foreign and the US tax rates. (Nessa 2017).

In addition, this system gives US MNCs two options for their foreign earnings: (i) immediately repatriate and pay repatriation tax; or (ii) defer repatriation and the payment of repatriation tax (Dong et al. 2019a). However, the US-based parent company has enjoyed some

degree of tax deferral during the period when the cash is held by the foreign subsidiary. More specifically, because the US parent company does not pay taxes on foreign income immediately, it has the privilege of using the fund for several years before paying it back to the government. Due to the deferral of foreign dividends, foreign cash and unremitted foreign earnings (UFE), they are generally known as "tax-induced foreign cash"[6] or "trapped cash" (Atwood et al. 2020).

In 2004, US Congress enacted the American Jobs Creation Act (AJCA) which reduced the tax cost to repatriate foreign earnings for US MNCs and provides an effective exogenous setting for examining tax-induced behaviour in the US (Blouin and Krull 2009; Chen 2014; Clemons and Kinney 2009; Faulkender and Petersen 2012; Graham, Hanlon and Shevlin 2010). Under the passage of the AJCA, dividends received on earnings repatriated in the current fiscal year can be deducted at 85% (October 22, 2004) or in the following fiscal year, the maximum US tax rate on repatriated earnings would be reduced from 35% to 21% (Laplante and Nesbitt 2017). Furthermore, in order to stimulate the US economy, the tax holiday sought to encourage the repatriation of foreign earnings that would have otherwise remained overseas, so that firms can use the repatriated funds to increase their domestic investment (Dong et al. 2019a). In 2017, the Tax Cut and Jobs Act (TCJA) moved the United States from the worldwide tax system to the territorial tax system. Thus, for foreign income earned after 2018, repatriation tax no longer constrains firms' investment decisions or repatriation (Yang, Lord and Saito 2019).

After 2018, under the TCJA legislation, domestic firms and MNCs were given four primary incentives to invest in the US. First, the tax rate decreased from 35 per cent to 21 per cent, which is below the top rate in all major G7 economies except the UK. Second, previously

[6] According to Hanlon, Lester, and Verdi (2015), tax-induced foreign cash, defined as the amount of foreign cash attributable to the firm's repatriation tax liability.

"trapped cash" in foreign countries no longer has to be "trapped" due to the transition tax elimination of future US taxes on repatriation of foreign subsidiaries' earnings. Third, by increasing bonus depreciation to 100 per cent for qualified property placed in service between September 27, 2017 and January 1, 2023, the TCJA increased immediate expensing of capital expenditures. Finally, the TCJA provides a 35 per cent deduction for foreign-derived intangible income (FDII). This is supposed to encourage firms to transfer intangible assets back to the US from low-tax foreign jurisdictions (or to refrain from doing so) (Atwood et al. 2020). Smolyansky, Suarez, and Tabova (2019) estimate that approximately $1 trillion in cash and cash equivalents was accumulated by US MNCs by the end of 2017, excluding funds permanently invested in foreign operations. In the same vein, based on hand-collected data from US corporations' SEC 10-K filings, Huang, Manakyan, and Mathers (2020) estimate total foreign cash holdings of Russell 1000 companies at $923 billion in 2016 and $912 billion in 2017.

4.3 Prior Literature and Hypothesis Development

4.3.1. Transfer Pricing

Transfer pricing, according to Tania and Kurniawan (2019), is the price contained in every product or service provided by one division to another within the same company or between companies that have a special relationship. The Organization for Economic Co-operation and Development (OECD) defines transfer pricing in MNCs as transactions that are normally carried out between group members. An MNC is probably in a position to adopt whatever principles are convenient to it as a group, so their prices are not necessarily the result of the free play of market forces (Affairs 1979). Additionally, a transfer price is a price attached to a good, service, intangible asset, or financial transaction by a corporation and there are two types

of transfer pricing transaction: intra-company and inter-company transfer pricing (Setiawan 2014).

Transfer pricing is used for both non-tax purposes, such as resource allocation, and to facilitate tax avoidance (Sikka and Willmott 2010). It can be used to increase divisional profits when managerial compensation is based on such profits, as well as to shift income (Borkowski 2010), thereby assisting MNCs in relocating funds overseas in more tax-favourablejurisdictions (Chan, Lo and Mo 2015; Rossing 2013), to facilitate congruent goals andoutcomes between divisions, assist in the evaluation of subsidiary performance and market share, to maximize profits, and to minimize group tax obligations (Clausing 2009). It is also atool that integrates and differentiates parts of an organization and facilitates measurement of their performance (Rossing and Rohde 2014).

Recently, due to the rapid growth of multinational trade and the opening of many key markets in developing countries, the use of transfer pricing tax strategies has attracted a high level of international attention (Holtzman and Nagel 2014). According to Borstell and Hobster (2014), who undertook a global survey, transfer pricing risks represent one of the most critical and challenging issues that companies are currently facing. There is a conflict of interest between management's companies and various taxing authorities across various countries that makes this issue difficult to resolve.

4.3.2. Non-arm's-Length Transaction

Transfer pricing constitutes a legal commercial business transaction if it is based on the arm's-length principle. Holtzman and Nagel (2014) refer this principle to transactions in which buyers and sellers act independently and do not conduct those transactions on non-commercial terms and conditions. In setting up financial reports, companies with affiliates and transactions with

them are required to comply with IAS 24[7] *Related Party Disclosure*. Through transactions and relationships between affiliated companies, this standard aims to improve the quality and provision of accounting information related to dealings between affiliates (Manaligod and Del Rosario 2012). According to IAS 24, financial reporting by related parties must include information on relationships between related parties, compensation of company management, related party transactions, the use of transfer pricing, and accounting policies for transactions with affiliated companies (Agyei-Mensah 2019). Compliance with IAS 24 should allow investors, analysts and other users of financial statements to better understand the nature and effect of related party transactions on financial position and profit or loss (Manaligod and Del Rosario 2012).

The manipulation of transfer prices, however, can result in unfair, unequal, potentially unethical and illegal outcomes, a condition commonly referred to as "abuse of transfer pricing". Klassen and Laplante (2012) define this non-arm's-length income shifting as "a plan or structure that causes relatively more income to be earned in lower tax rate jurisdictions than would otherwise be expected based on the company's worldwide asset allocation". Several US companies, including Google, Starbucks, and Amazon, have been exposed to misuse of transfer pricing practices in an effort to avoid taxes. MNCs are commonly engaged in such misappropriations since tax rates vary from country to country (Barford and Holt 2013). Therefore, MNCs can establish subsidiaries in countries with low taxes, and even in tax haven countries (Citra and Harto 2019).

In addition, MNCs can decrease their tax burden by manipulating the prices they transfer between divisions or subsidiaries (Leitch and Barrett 1992). In order to control for geographic income distribution, an MNC has incentives to manipulate transfer prices.

[7] For more information, see: https://www.ifrs.org/issued-standards/list-of-standards/ias-24-related-party-disclosures/

Generally, it is assumed that by artificial shifting income to low-tax countries, the MNCs will bring in higher profits after tax and thereby lower its global tax liability (Choi, Furusawa and Ishikawa 2020). Companies manipulate transfer pricing when they either purchase or sell to an affiliated entity by underpricing or overpricing due to the fact that the two companies are located in different tax jurisdictions (Brock and Pogge 2014; Cristea and Nguyen 2016; Dyreng and Lindsey 2009; Slemrod and Wilson 2009). As a result of such manipulation, MNCs have the opportunity to redirect profits from countries where they originated to countries with lower tax rates.

Transfer pricing has been identified in the literature as a potential tax avoidance practice of MNCs (Brock and Pogge 2014; Choi and Day 1998; Cristea and Nguyen 2016; Dyreng and Lindsey 2009; Muhammadi, Ahmed and Habib 2016; Slemrod and Wilson 2009; Taylor and Richardson 2012). MNCs reduce international taxes through transfer pricing manipulation, thin capitalization and tax haven utilization, payment of intangibles, income shifting, and financing structure of affiliates (Brock and Pogge 2014; Jacob 1995; Taylor and Richardson 2012). Further, previous literature claims that transfer pricing manipulation is the primary means by which corporations try to maximize global profits and minimize taxes (Janský, Prats and Aid 2013; Pendse 2012).

4.3.3. Offshore Financial Centres

Offshore financial centres (hereafter OFCs), often referred to as "tax havens", are where the government offers preferential treatment for companies in terms of finance, taxation, and tax policy. Examples of tax haven countries include Singapore, Netherlands, Hong Kong, Ireland, and Luxembourg (Desai, Foley and Hines Jr 2006a). There are about 40 OFCs in the world. According to Zucman (2014), approximately 20% of all US corporate profits are booked in OFCs. MNCs that have their headquarters registered in OFCs are classified as Type I offshore firms, while MNCs with their subsidiaries in OFCs are referred to as Type II offshore firms,

such as US and UK companies (Kim and Li 2014). A number of MNCs use OFCs to evade taxes and to loot money from outside minority investors, as exemplified by the well-publicized Enron and Tyco cases (Desai 2005).

There are a variety of elements common to OFCs, such as low or zero tax rates, bank secrecy laws and not sharing information with other regulators or tax authorities in other countries (Tobin and Walsh 2013). For example, OFCs assist firms to allocate their taxable income to low-tax jurisdictions in order to avoid taxes. Moreover, US MNCs use transfer pricing to maximize profits via OFCs in order to obtain tax cuts (Citra and Harto 2019). Dyreng and Lindsey (2009) argue there is a 1.5 percentage point difference in the worldwide tax rates on pre-tax worldwide income for US corporations with material operations in at least one tax haven country. Anh, Hieu, and Nga (2018) claim that one of the six factors to determine transfer pricing aggressiveness in Vietnamese enterprises is the utilization of tax havens. Soepriyanto, Zudana, and Linggam (2020) find evidence that companies with tax haven operations have higher cash holdings compared to their counterparts. Harris (1993) finds there is a negative association between the presence of foreign operations and US MNCs' tax payments in the US, evidenced in three of the lowest tax countries, such as Ireland, the "dragon" Asian countries, and tax haven countries.

It is expected that tax haven countries will facilitate the use of transfer pricing practices to minimize tax payments. This can enable companies to utilize tax havens as the operational location of subsidiaries and a tool for tax evasion (Citra and Harto 2019). A corporate group resident in a country with tax haven status can also easily implement aggressive transfer pricing because of the favourable financial, legal, and tax regimes available (Dharmapala and Hines Jr 2009). Taylor, Richardson, and Lanis (2015) conclude that intangible assets and the use of tax havens are two factors that help firms to obtain tax benefits through transfer pricing aggressiveness.

4.3.4. Advance Pricing Agreements (APAs)

Tax authorities globally have increased their effort in the field of transfer pricing, including increasing penalties, improving audit staff training, and focusing on arm's-length transactions, as well as increasing audit and inspection activity, increased information exchange, and implementation of new documentation requirements (Holtzman and Nagel 2014).

As early as 1979, the OECD issued guidelines to tax authorities and MNCs on how to build transfer pricing regulations to implement article 9.[8] This requires transfer prices to comply with the "arm's-length principle" in order to curb profit shifting, as defined in Article 9 of the "Model Tax Convention on Income and on Capital" and corresponding national rules (Byrnes and Cole 2006). According to the arm's-length principle, a transfer price for a specific intra-firm transaction should be comparable to the price negotiated for the same transaction with an unrelated third party (Holtzman and Nagel 2014). Additionally, transfer pricing guidelines (TPG) have been published since 1995 and have been updated several times (Eden 2015). The Base Erosion and Profit Shifting (BEPS) project was first introduced in 2011 and countries have strengthened their transfer pricing enforcement since then (Yoo 2020).

However, many MNCs have turned to an APA to reduce their tax risk (Markham 2012). This is a formal agreement between a tax authority and an MNC, in which the parties agree on how the MNC will conduct its transfer pricing, to estimate its taxable income, and to pay taxes for a fixed period, thus reducing the likelihood of a discrepancy in income taxes (Eden 2015; Markham 2012). APAs are designed as a tool to resolve disputes between related

[8] For more information, see: https://www.oecd.org/tax/transfer-pricing/oecd-transfer-pricing-guidelines-for-multinational-enterprises-and-tax-administrations-20769717.htm

parties before transactions, although they may cover related party transactions from previous years as well as those from future years (Eden and Byrnes 2018a).

APA use is on the rise, with the number of agreements growing substantially from 758 (in 2009) to 2055 (in 2012) (Becker, Davies and Jakobs 2017). APAs are widely interpreted and described as a form of insurance against future shocks to tax regulatory adjustments (Becker, Davies and Jakobs 2017). Prior literature (Klassen and Laplante (2012); (Marques and Pinho 2016; Riedel, Zinn and Hofmann 2015) show that stronger regulations reduce income shifting activities of MNCs resulting in increased pre-tax income of low-tax rate affiliates. According to Whitford (2010), APAs are more common in countries with high tax rates, which may lead these countries to use APAs as a commitment mechanism to prevent them from excessive taxation. Increased regulations both domestically and abroad decrease reported profits of low- and high-tax-rate firms due to compliance costs (Saunders-Scott 2014).

When a multinational firm faces strict regulations regarding transfer pricing in its country of domicile, reporting additional income in the home country can reduce costs, since it becomes less likely to face audits and adjustments on transfer pricing (De Waegenaere, Sansing and Wielhouwer 2006). Lohse and Riedel (2013) argue that transfer pricing regulations could, on average, contribute to a reduction in income shifting and profit shifting behaviour by nearly 50%. Using a sample of European foreign affiliates, Marques and Pinho (2016) state that MNCs cannot move profits to tax havens or lower tax jurisdictions when the transfer pricing regulations are strictly applied.

4.3.5. Corporate Cash Holdings

US firms hold a large amount of cash compared to their assets, but MNCs report a much higher cash balance than purely domestic firms due to precautionary measures to cover transaction costs (Bates, Kahle and Stulz 2009; Han and Qiu 2007; Mulligan 1997; Opler et al. 1999;

Ozkan and Ozkan 2004). Pinkowitz, Stulz, and Williamson (2016) document that "firms that became multinational after 1998 have high cash holdings" and call for further research into this anomaly. According to Foley et al. (2007), the reasons MNCs hold so much cash in their foreign subsidiaries relate to the cost of repatriating foreign income. However, Pinkowitz, Stulz, and Williamson (2016) find that the tax treatment of profit repatriations cannot purely explain the increase in cash holdings of multinational firms.

Tax laws in the US and many other countries defer taxation of foreign income until earnings are repatriated, making US multinationals tempted to retain earnings abroad, and to a large extent, these firms hold these funds in cash (Fabrizi, Ipino and Parbonetti 2018). The US Federal Reserve reported that, as of December 31 2015, non-financial corporations held $1.9 trillion in cash, the majority of which was "trapped" in foreign accounts, mostly to avoid tax repatriation costs. Under US tax law, foreign subsidiaries' operating earnings are not subject to US tax until they are repatriated (Eulaiwi et al. 2020). Multinational corporations are more likely to retain earnings in low-tax jurisdictions (Beuselinck and Du 2017; Gu 2017; Zheng 2019).

Many companies that invest earnings in low-tax foreign jurisdictions have a financial incentive to hold these earnings there rather than at home. Consider, as an example, an incorporated affiliate that earns $100 and pays $20 in foreign income taxes. If that company repatriates its earnings immediately, it pays an additional $15 in US taxes and then invests the remaining $65 in liquid securities. The earnings associated with this investment will be taxed at the US tax rate. Nonetheless, if the firm does not repatriate the earnings, it can invest $80 in the liquid security. Although Subpart F regulations require the company to pay US taxes on earnings associated with this investment, the company is better off holding cash abroad, since doing so defers this tax on the original $100 of earnings (Foley et al. 2007).

4.3.6. Hypothesis Development

Under the perspective of agency theory, there is a contract between principals and agents in which they have different interests and requirements (Jensen and Meckling 2019). Agents do not always act according to the principals' wishes, so the principals need to design the right contract to ensure that both parties' interests are aligned if a conflict occurs (Jensen and Meckling 2019; Scott 2015). Zulma (2016) argues that agents tend to avoid taxes as a result of bonuses and incentives they receive for their performance. According to this theory, managerial privileged positions can be utilized by managers to maximize their utility function instead of serving the interests of a firm's owner (Jensen and Meckling 1976). Cash holdings are held and deployed at managers' discretion, with little oversight (Dittmar and Mahrt-Smith 2007). Cash resources are therefore the most likely to be expropriated for negative net present value (NPV) projects or for opportunistic actions that do not create value for shareholders (Dittmar and Mahrt-Smith 2007; Harford 1999). Having liquid assets becomes irrelevant in a world of perfect financial capital markets because firms can raise cash at no cost when necessary to keep operations running and to invest (Opler et al. 1999).

On the other hand, in imperfect capital markets, cash holdings provide firms with benefits (Harford 1999). Using internal funds is less expensive than raising external funds in the presence of asymmetric information (Kim, Mauer and Sherman 1998). Similarly, businesses make use of precautionary cash to hedge against the risk of cash shortfalls (Opler et al. 1999), especially in times of crisis (Manoel, da Costa Moraes, et al. 2018; Manoel, Moraes, et al. 2018). According to the agency theory on corporate tax avoidance, aggressive tax planning enables management with the masks, tools, and justifications to selectively disclose or withhold firm-specific information in an attempt to produce targeted profits and resources (Desai 2005; Kim, Li and Zhang 2011).

According to Indriaswari and Nita (2018), MNCs mostly use transfer pricing practices to minimize tax payments to the government. By moving company profits or revenues to countries with low tax rates, companies can reduce the amount of tax paid by price engineering services and goods that are transferred between divisions (Richardson, Taylor and Lanis 2013). Transfer pricing is also used to increase the complexity of international tax avoidance transactions conducted through tax havens (Taylor and Richardson 2012). In contrast to other market transactions between independent parties, these transactions can differ from other market transactions between associate group entities by allowing them to freely set a lower price for a product or service in order to reduce the tax base and maximize profits for their holding company. Moreover, an Ernst and Young's survey conducted in 2016 indicates that transfer pricing is critical for international taxation arrangements of MNCs. Even though tax avoidance has significant risks, companies may still proceed to participate in such arrangements since they minimizes tax burdens (Zulma 2016).

On the basis of tax-avoidance agency theory, Desai and Dharmapala (2006); (Desai, Dyck and Zingales 2007) argue that firms use sophisticated basis transactions to avoid being discovered by tax authorities. As well as hiding resources from tax authorities, these sophisticated transactions can hide resources from shareholders, allowing managers to use them to their advantage (e.g. to extract economic rents from the company). A complex tax avoidance strategy can also increase shareholders' supervision costs and aggravate the information asymmetry between shareholders and management.

Through exploitation of weaknesses in tax laws and regulations, transfer pricing transactions minimize the amount of taxes due. Armstrong et al. (2015) claim that companies with unclear tax avoidance regulations tend to be more aggressive in their tax planning. Corporate governance is important to improving the understanding between management and shareholders (Lee, Dobiyanski and Minton 2015). In this way, companies with good corporate

governance do not engage in tax-aggressive behaviour. On the other hand, companies with poor corporate governance may pursue aggressive tax avoidance arrangements. According to Desai, Dyck, and Zingales (2007), corporate taxes and corporate governance interact betweenthree parties: tax authorities; insiders; and shareholders. A high before-tax income would increase marginal rent extraction benefits for insiders in a high-tax regime. Enhanced tax enforcement would, however, discourage insiders from extracting rent, boosting a firm's value.Under a strong corporate governance environment, tax revenue would increase through highertax rates.

There are various motives that influence firms to hold cash. Prior empirical research shows that firms hold cash due to precautionary motives (Bates, Kahle and Stulz 2009; Opler et al. 1999), transaction costs avoidance (Opler et al. 1999), agency motives (Seifert and Gonenc 2018), tax motives (Foley et al. 2007) and predation motives (Haushalter, Klasa and Maxwell 2007). Despite these benefits, prior research indicates holding cash has several downsides as well (Myers and Rajan 1998). First, cash holdings are subject to tax disadvantages (Opler et al. 1999). Second, there is an opportunity cost to holding cash as cash represents a low rate of return compared to more productive but less liquid assets (Kim, Mauer and Sherman 1998; Opler et al. 1999). Third, regarding the free cash flow hypothesis, Jensen and Meckling (1976) argue that managers may use liquidity to increase their own wealth at the expense of shareholder wealth due to incentive misalignment between agents and principals (Harford 1999; Myers and Rajan 1998; Opler et al. 1999).

Most empirical studies find that corporate cash holdings are driven largely by transactional and precautionary motives. However, Foley et al. (2007) find evidence that cash holdings of US MNCs have been influenced by repatriation taxes. Therefore, this paper will examine the association between non-arm's-length transactions, offshore financial centres, transfer pricing agreements and corporate cash holdings via tax motive. In addition, production

location and transfer pricing are two mechanisms by which multinational companies can shift income to low tax jurisdictions when their repatriation tax burden is high. Foley et al. (2007) conclude that firms keep excess cash overseas to defer repatriation tax and manipulate transfer prices of goods and services. If a company uses transfer pricing extensively without arm's-length transactions, it is deemed to engage in aggressive transfer pricing (Richardson et al., 2013).

Levin and Coburn (2012) state that if aggressive transfer pricing techniques are carried out by related parties without considering the arm's-length principle, the profits of low-tax jurisdictions are artificially inflated, while profits of high-tax jurisdictions are deflated. Similarly, Sikka and Willmott (2010) argue that profit shifts from high-tax economies to low-tax economies are mainly achieved by manipulating transfer pricing. Therefore, it could be argued that as a result of aggressive profit-shifting activities, MNCs have trillions of dollars in foreign earnings sitting offshore. Based on the explanation above, the first hypothesis of this study is stated as follows:

H1*: There is a positive association between non-arm's-length transaction and corporate cash holdings.*

The previous section (Section 2.2.3) indicates that US MNCs engage in more transfer pricing aggressiveness via OFCs in order to generate higher cash tax savings. OFCs offer MNCs very low or zero tax rates, lax legal enforcement, flexible regulations, and secrecy of bank accounts. As a result, MNCs moving their business operations or headquarters to low-tax regimes have substantial tax benefits and allow them to evade stringent regulatory requirements and/or legal enforcement (Desai, Dyck and Zingales 2007). Durnev, Li, and Magnan (2017) state that firms with subsidiaries in tax-havens/OFCs engage in aggressive tax planning more than other firms do. In addition, tax havens offer companies the ability to relocate their taxable

profits between countries (Desai and Dharmapala 2006). MNCs, in particular, may sell their goods to affiliates in tax havens in order to generate high profits without paying taxes. They are also likely to shift goods and expenses from tax havens to countries that have high tax rates because of the high costs of reducing taxable profits and evading taxes (Desai, Foley and Hines Jr 2006a).

While of most OFCs have common law legal systems, which are regarded as better for protecting investors, their flexible regulations and weak legal enforcement make it difficult for public shareholders to protect their rights (Dharmapala and Hines Jr 2009). Therefore, the characteristics of OFCs make it difficult for outside investors and securities regulators to obtain detailed concrete information about them, and the secrecy policy of offshore firms allows them to accumulate capital with no significant disclosure, even when their shares are publicly traded. In addition, managers and/or controlling owners (MCOs) of Type II offshore firms are likely to face relatively low litigation risk, compared with those of non-offshore firms in their home countries (Kim and Li 2014).

Furthermore, when corporations have associates based in tax havens, their tax liability in the US is lower. Therefore, the establishment of affiliates in OFCs is one of the main goals of the group and a very important part of its operations (Slemrod and Wilson 2009). Bringing those results together, if transfer pricing via OFCs enables companies to reduce their tax payments, then they will have higher cash holdings as an effect of higher cash tax savings. Thus, to test the role of offshore financial centres utilization in the corporate cash holding, the next hypothesis is proposed:

H2*: There is a positive association between offshore financial centres and the level of firm cash holdings.*

Many MNCs have turned to APAs to reduce their tax risk (Markham 2012). Previous literature (Klassen and Laplante (2012); (Marques and Pinho 2016; Riedel, Zinn and Hofmann 2015) conclude that stronger regulations reduce income-shifting activities of MNCs, resulting in increased pre-tax income of low-tax rate affiliates. APAs are more common in countries with high tax rates, which may lead these countries to use APAs as a commitment mechanismto prevent them from excessive taxation (Whitford, 2010). In 2004, the first year of the tax holiday, aggregate repatriation totalled $82 billion, a 44 per cent increase over the pre-holiday average. The AJCA significantly increased the repatriation of foreign earnings (Dong et al. 2019a).

A transfer pricing regulation limits the methods that an MNC can use for setting an arm's-length price, specifies the documentation that must be provided for an arm's-length price, and specifies penalties for mispricing or inadequate documentation. Therefore, stricter regulations will increase the cost of transfer mispricing and will be effective in curbing the extent of profit-shifting activities(Choi, Furusawa and Ishikawa 2020). If a multinational firm faces strict and enforced transfer pricing regulations this will discouragede them from shifting income out of the country and this will lead to a decrease in corporate cash holding overseas.

The aforementioned studies emphasize the ability of US MNCs to hold a large amount of cash abroad through aggressive transfer pricing activity. However, stronger regulations such as APAs and the AJCA will reduce repatriation risk, trapped cash risk, and litigation risk, thus, these effects of APAs will reduce the level of corporate cash holding oversea. The last hypothesis is stated as follows:

H3*: There is a negative association between transfer pricing agreement with tax authorities and corporate cash holding.*

4.4. Methodology and Research Design

4.4.1. Sample Selection

The sample comprises listed US MNCs listed over the period 2006–2020. The sample period corresponds to a period of considerable change in the US tax system. In 2004, the US Congress enacted the *American Jobs Creation Act* (AJCA), which reduced the tax cost to repatriate foreign earnings back to the US and hence provides an effective exogenous setting for examining tax-induced behaviour in the US (Blouin and Krull 2009; Chen 2014; Clemons and Kinney 2009; Faulkender and Petersen 2012; Graham, Hanlon and Shevlin 2010). In addition, the *Tax Cut and Jobs Act* (TCJA) in 2017 changed the tax system from a worldwide tax system to a territorial one. The original sample (3,628 firm-year observations) is reduced after removal of firms with missing financial data (942 firm-year observations). The final sample, thus, comprises 2,686 firm-year observations. Financial data were collected from *Compustat* database. Transfer pricing data were collected manually from 10-K annual reports. Table 4.1 provides a summary of the sample selection. The data are winsorized at the 1st and 99th percentiles to decrease the probability that outliers affect the results.

Table 4.1 Sample Selection

Total number of firm-year observations (2006–2020)	3,628
Less: Missing financial data	(942)
Final sample	2,686

4.4.2. Measurements of Variables

4.4.2.1 Dependent variable

Consistent with previous literature, this study measures its dependent variable (i.e. corporate cash holdings) through the use of three specifications. The first measure (*CASH_TA*) is the ratio of cash and marketable securities to total assets as an asset-weighted average of firm-levelcash ratios (Azar, Kagy and Schmalz 2016). This measurement can be, however, problematic

owing to the existence of extreme outliers. Hence, based on Opler et al. (1999), I also measure the level of cash holdings as the ratio of cash and marketable securities to net assets (*CASH_NA*), where net assets are total assets minus cash and marketable securities (Megginson, Ullah and Wei 2014). Third, based on Foley et al. (2007), I measure the level of cash holding as the natural logarithm of cash and marketable securities to total assets (*CASH_LN*) in order to reduce the effect of extreme outliers and to ensure normality in this measure (Qiu and Wan 2015).

4.4.2.2 Independent variables

The first variable of interest is the existence of a non-arm's-length transaction (*Non_ARM)* which is measured as a dummy variable, coded as 1 if related-party transactions are not disclosed within the annual report as being conducted on normal commercial terms, and 0 otherwise. The second independent variable is whether a firm has at least one subsidiary being a designated offshore financial centre *(FIN_CEN)*. This is measured as an indicator variable equal to 1 if the firm has at least one subsidiary company incorporated in an offshore financial centre (Switzerland, Dubai, Luxembourg, Hong Kong, Singapore or Ireland) and, 0 otherwise. The third independent variable is the existence of a transfer pricing agreement *(TP_AGR)*, which is measured as a binary variable, coded 1 if the firm has a transfer pricing agreement with a taxing authority, and 0 otherwise.

4.4.2.3 Control variables

This study includes several variables in the regression models to control for other effects on transfer pricing (Al-Hadi et al. 2020; Azar, Kagy and Schmalz 2016; Opler et al. 1999). Firm size *(SIZE)* is measured as the natural logarithm of total assets, and is controlled for since firms that have the greatest access to capital, such as large firms or firms that pay a dividend, hold less cash. This is expected to have a negative coefficient on *SIZE* as larger firms tend to hold

less cash due to economies of scale. Because firms with strong growth opportunities and riskier cash flows hold more cash, this study controls for the ratio of the book value of equity to the market value equity *(BTM)* and I expect a negative coefficient on *BTM*. This study also includes firm leverage *(LEV)*, which is equal to the ratio of total debt to the sum of total debt and the market value of equity. Opler et al. (1999) suggest that firms may reduce their debt constraints by using cash reserves, it is, therefore, expected that firm leverage is negatively correlated to cash holdings. In addition, this study controls for a number of firm profitability measures: return on assets *(ROA)* is measured as net income scaled by total assets, and *LOSS* is a dummy variable, coded 1 if the corporation has net income less than zero, and 0 otherwise. I include an indicator variable *(DIV)* that equals one if the firm pays a dividend in a given year, and 0 otherwise since firms paying more dividends tend to hold less cash because such firms are likely to be less risky (Opler et al. 1999). *PPE* is property, plant, and equipment scaled by lagged assets. Unrecognized Tax Benefit *(UTB)*, computed as the natural logarithm of total uncertain tax benefits (UTBs) that a firm accrues, is also controlled for as domestic firms and multinational firms tend to hold larger cash balances when subject to greater tax uncertainty (Hanlon, Maydew, and Saavedra (2017). Big4 auditor *(BIG4)* is measured as a binary variable, coded 1 if the corporation is audited by a Big4 audit firm, and 0 otherwise. *BD_Qual* is calculated as the natural logarithm of the total number of qualifications of board members. Board independence *(IND)* is the proportion of board members that are independent directors. *(AGE)* refers to firm age, calculated as the natural logarithm of the difference between incorporation year and current year.

4.4.3 Model Specifications

In order to test hypotheses, fixed-effects regression models are used to ensure other unobservable time-invariant firm characteristics do not influence the level of cash holdings (Bentley et al., 2013; Yang et al., 2018). The model for testing H1 is estimated as follows:

$$CASH_{it} = a0 + \beta_1 Non\_ARM_{it} + \beta_2 SIZE_{it} + \beta_3 MTB_{it} + \beta_4 LEV_{it} + \beta_5 ROA_{it} + \beta_6 PPE_{it} + \beta_7 UTB_{it} + \beta_8 LOSS_{it} + \beta_9 DIV_{it} + \beta_{10} BD\_Qual_{it} + \beta_{11} IND_{it} + \beta_{12} BIG4_{it} + \beta_{13} AGE_{it} + Firm\ FE + Year\ FE + \varepsilon_{it}$$

Equation (1)

where *i* denotes a firm MNCs, *t* = financial years 2006–2020, *CASH* = Corporate cash holdings, *Non_ARM* = Non-arm's-length transaction, and ε = the error term. Appendix A provides the variable definitions and measurement details for all variables.

The model for testing H2 is estimated as follows:

$$CASH_{it} = a0 + \beta_1 FIN\_CEN_{it} + \beta_2 SIZE_{it} + \beta_3 MTB_{it} + \beta_4 LEV_{it} + \beta_5 ROA_{it} + \beta_6 PPE_{it} + \beta_7 UTB_{it} + \beta_8 LOSS_{it} + \beta_9 DIV_{it} + \beta_{10} BD\_Qual_{it} + \beta_{11} IND_{it} + \beta_{12} BIG4_{it} + \beta_{13} AGE_{it} + Firm\ FE + Year\ FE + \varepsilon_{it}$$

Equation (2)

where *FIN_CEN* = offshore financial centres.

The model for testing H3 is estimated as follows:

$$CASH_{it} = a0 + \beta_1 TP\_AGR_{it} + \beta_2 SIZE_{it} + \beta_3 MTB_{it} + \beta_4 LEV_{it} + \beta_5 ROA_{it} + \beta_6 PPE_{it} + \beta_7 UTB_{it} + \beta_8 LOSS_{it} + \beta_9 DIV_{it} + \beta_{10} BD\_Qual_{it} + \beta_{11} IND_{it} + \beta_{12} BIG4_{it} + \beta_{13} AGE_{it} + Firm\ FE + Year\ FE + \varepsilon_{it}$$

Equation (3)

where *TP_AGR*= existence of a transfer pricing agreement.

4.5 Empirical Results

4.5.1 Descriptive Statistics

Table 4.2 shows the descriptive statistics of the final sample. The mean values for *Cash_TA*, *Cash_NA*, and *Cash_LN* are 0.14, 0.20, and -2.29, with standard deviations of 0.13, 0.27, and 1.25, respectively. The mean (median) value of *Non_ARM* is 0.85 (0.00), with a standard deviation of 0.36. The mean (median) value of *FIN_CEN* is 0.75 (0.00) and the mean (median) value of *TP_AGR* is 0.16 (0.00). This indicates that, on average, 85% of related-party transactions are not classified as being on normal commercial terms, 75% of firms has at least one subsidiary incorporated in an OECD listed tax haven, and 16% of the sample firms has a

transfer pricing agreement with tax authorities. Finally, the mean (median) values of the control variables are similar to those reported in the previous literature (Eulaiwi et al. 2020; Foley et al. 2007; Taylor, Richardson and Al-Hadi 2018).

Table 4.2 Descriptive statistics

Variable	N	Mean	S.D.	Min	P25	P50	P75	Max
CASH_TA	2,686	0.14	0.13	0.00	0.04	0.10	0.19	0.72
CASH_NA	2,686	0.20	0.27	0.00	0.05	0.11	0.23	2.58
CASH_LN	2,686	-2.29	1.25	-9.23	-3.06	-2.23	-1.46	0.95
Non_ARM	2,686	0.85	0.36	0.00	1.00	1.00	1.00	1.00
FIN_CEN	2,686	0.75	0.43	0.00	0.00	1.00	1.00	1.00
TP_AGR	2,686	0.16	0.37	0.00	0.00	0.00	0.00	1.00
SIZE	2,686	8.83	1.63	2.71	7.53	8.73	10.07	13.59
BTM	2,686	0.27	0.15	0.02	0.17	0.26	0.36	0.73
LEV	2,686	0.58	0.20	0.12	0.44	0.57	0.70	1.13
ROA	2,686	0.97	0.60	0.18	0.56	0.82	1.21	3.32
PPE	2,686	0.55	0.38	0.07	0.25	0.44	0.77	1.68
UTB	2,686	0.01	0.01	0.00	0.00	0.01	0.02	0.10
LOSS	2,686	0.15	0.36	0.00	0.00	0.00	0.00	1.00
DIV	2,686	0.22	0.24	0.00	0.00	0.16	0.34	1.14
BD_Qual	2,686	3.35	0.39	1.95	3.04	3.40	3.64	4.62
IND	2,686	0.72	0.15	0.36	0.60	0.67	0.89	1.00
BIG4	2,686	0.71	0.45	0.00	0.00	1.00	1.00	1.00
AGE	2,686	4.13	0.67	0.00	3.61	4.19	4.69	5.37

This table shows the descriptive statistics of all variables used in the analysis. The variables are defined in Appendix A.

4.5.2 Correlation Analysis

The Pearson correlation coefficients for all variables in this study are reported in Table 4.3. As expected, it is observed that the dependent variables *(CASH_NA, CASH_LN)* are significantly correlated with *FIN_CEN* (positively) and *TP_AGR* (negatively) at $p<0.01$, supporting the primary hypothesis that firms engaginge in offshore financial centres have more corporate cash holdings. Firms with an established transfer pricing agreement have lower levels of cash holdings, suggesting that transfer pricing agreements with taxing authorities deter multinational corporations from engaging in aggressive transfer pricing arrangements that could involve the shifting profits from higher- to lower-tax countries. In addition, several control variables (*SIZE, MTB, LEV, ROA, PPE, UTB, BIG4* and *AGE*) are correlated significantly with the dependent variables. Generally, the directions of the correlations are as expected, providing strong support in the validation of the choice and measurement ofvariables.

Table 4.3 Pearson correlation

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
(1) CASH	1																	
(2) CASH_NA	0.96***	1																
(3) CASH_LN	0.89***	0.78***	1															
(4) Non_ARM	0.01	0.01	0.00	1														
(5) FIN_CEN	0.13***	0.11***	0.18***	-0.08***	1													
(6) TP_AGR	-0.05***	-0.06***	-0.01	0.05***	0.04**	1												
(7) SIZE	-0.11***	-0.11***	-0.06***	0.08***	0.11***	0.05***	1											
(8) BTM	-0.22***	-0.17***	-0.26***	-0.03*	-0.03*	-0.09***	0.08***	1										
(9) LEV	-0.31***	-0.28***	-0.28***	-0.03*	0.02	-0.09***	0.29***	0.67***	1									
(10) ROA	-0.14***	-0.15***	-0.10***	-0.07***	-0.20***	-0.07***	-0.26***	-0.13***	0.11***	1								
(11) PPE	-0.31***	-0.30***	-0.29***	-0.04**	-0.27***	0.06***	-0.02	0.14***	0.05***	0.12***	1							
(12) UTB	0.25***	0.24***	0.24***	0.02	0.20***	0.00	0.22***	0.01	0.09***	-0.15***	-0.24***	1						
(13) LOSS	-0.01	0.01	-0.02	-0.04**	-0.03*	0.02	-0.13***	0.19***	0.10***	-0.09***	0.11***	0.02	1					
(14) DIV	-0.01	-0.02	0.02	0.02	0.05***	-0.05***	0.21***	0.08***	0.07***	0.07***	0.01	0.07***	-0.22***	1				
(15) BD_Qual	-0.01	-0.01	0.02	0.02	0.04**	0.00	0.51***	0.06***	0.20***	-0.07***	-0.13***	0.18***	-0.08***	0.19***	1			
(16) IND	-0.12***	-0.13***	-0.07***	-0.11***	0.02	0.00	-0.24***	0.15***	0.10***	0.03	0.04**	-0.14***	0.07***	-0.07***	-0.33***	1		
(17) BIG4	-0.13***	-0.14***	-0.13***	-0.05***	0.01	0.02	0.08***	-0.04**	0.07***	-0.12***	0.03*	-0.05***	0.00	-0.02	0.07***	-0.09***	1	
(18) AGE	-0.36***	-0.36***	-0.28***	-0.07***	0.06***	0.02	0.20***	0.11***	0.29***	0.07***	0.07***	-0.04**	-0.07***	0.20***	0.18***	0.12***	0.08***	1

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

4.5.1 Regression Results

4.5.1.1 The association between non-arm's-length transaction and corporate cash holdings

Table 4.4 presents the results of fixed-effect regressions designed to test the association between the existence of non-arm's-length transactions (*Non_ARM*) and corporate cash holdings (H1). In Models (1)–(3), the coefficients of *Non_ARM* is positive and significant (*p*-value < 0.01) for all three measures of cash holdings at 0.040 (*CASH_TA)*, 0.038 (*CASH_NA)* and 0.625 (*CASH_LN*). These results suggest that there is a positive association between the existence of non-arm's-length transactions and corporate cash holdings, providing evidence to support the first hypothesis (H1). In terms of economic significance, a one standard deviation increase in *Non_ARM* results in an increase in the ratio of cash and marketable securities to total assets (*CASH_TA*) by 1.44%.[9] For the control variables, the coefficient estimates are consistent with prior studies on corporate cash holdings (Eulaiwi et al. 2020; Foley et al. 2007; Taylor, Richardson and Al-Hadi 2018) with statistical significance evident for *SIZE*, *MTB*, *LEV*, *ROA*, *PPE*, *UTB*, *DIV*, *IND*, *BIG4* and *AGE*.

[9] The economic effect is computed as one standard deviation of *Non_ARM* (0.36) multiplied by coefficient of *Non_ARM* in Column (1) of Table 2 (0.04), which is equal to an increase of 0.0144 (1.44%) in cash holdings.

Table 4.4 Non-arm's length transaction and corporate cash holdings (H1).

Variables	Model (1)	Model (2)	Model (3)
	CASH_TA	*CASH_NA*	*CASH_LN*
Constant	0.933***	1.679***	2.220*
	(8.43)	(5.91)	(1.93)
Non_ARM	**0.040*** **	**0.038** **	**0.625** **
	(2.92)	**(2.05)**	**(2.33)**
SIZE	-0.067***	-0.127***	-0.629***
	(-11.21)	(-8.88)	(-11.39)
BTM	-0.054*	-0.040	-0.837***
	(-1.87)	(-0.61)	(-2.79)
LEV	-0.100***	-0.234***	-0.771***
	(-3.99)	(-3.93)	(-3.14)
ROA	-0.032***	-0.073***	-0.272***
	(-2.85)	(-2.73)	(-3.01)
PPE	-0.052***	-0.129***	-0.413***
	(-3.15)	(-3.05)	(-2.61)
UTB	-0.209	-0.897*	-1.636
	(-1.11)	(-1.80)	(-0.93)
LOSS	-0.003	-0.007	-0.035
	(-0.77)	(-0.66)	(-0.77)
DIV	0.018	0.050*	0.248**
	(1.34)	(1.73)	(2.07)
BD_Qual	-0.008	-0.008	-0.088
	(-1.08)	(-0.59)	(-1.21)
IND	-0.040***	-0.103***	-0.198
	(-2.62)	(-2.82)	(-1.33)
BIG4	0.006	0.001	0.108*
	(0.94)	(0.07)	(1.95)
AGE	-0.005	0.009	0.580**
	(-0.19)	(0.14)	(2.04)
FIRM FE	YES	YES	YES
YEAR FE	YES	YES	YES
Adj. R-sq	0.805	0.752	0.788
N	2,686	2,686	2,686

The table presents the fixed effects regression results on the effect of non-arm's length transactions on corporate cash holdings. The dependent variable *(CASH)* is measured using three specifications (*Cash_TA*, *Cash_NA*, and *Cash_LN*). The variable of interest, *Non_ARM*, is a dummy variable, coded as 1 if related-party transactions are not described as being on normal commercial terms, 0 otherwise. All control variables are defined in Appendix A. Coefficient estimates are reported with *t*-statistics in parentheses. Statistically significant of the estimates are denoted with asterisks: ***, **and* correspond to 1%, 5% and 10% levels of significance, respectively.

4.5.1.2 The association between offshore financial centres and corporate cash holdings

Table 4.5 presents the ordinary least squares (OLS) regression results of the relationship between occurrence of offshore financial centres and cash holdings. The coefficients on *FIN_CEN* are positive and statistically significant (*p*-value < 0.01) across all three cash holding specifications at 0.012, 0.024, and 0.120 for *Cash_TA*, *Cash_NA*, and *Cash_LN*, respectively. This result supports H2 and indicates that offshore financial centres facilitate the use of transfer pricing designed to minimize tax payments and to generate higher cash tax savings. In terms of economic significance, a one standard deviation increase in offshore financial centres

(FIN_CEN) results in an increase in cash and marketable securities, measured in natural logarithm (*CASH_LN*) by 5.16%.[10] It is found that some control variables, such as firm size (*SIZE*), book-to-market ratio (*BTM*), firm leverage (*LEV*), return on assets *(ROA)*, property, plant and equipment (*PPE*), uncertain tax benefits *(UTBs)*, and board independence (*IND*), are negatively and significantly associated with firms' cash holdings. In contrast, dividends *(DIV)*, Big4 auditor *(BIG4)* and firm age (*AGE*) are positively and significantly associated with the level of cash holdings. The sign and significance of the control variables are generally consistent with that of prior studies on cash holdings (Al-Hadi et al. 2020; Azar, Kagy and Schmalz 2016; Megginson, Ullah and Wei 2014).

[10] The economic effect is calculated as one standard deviation of *FIN_CEN* (0.43) multiplied by coefficient of *FIN_CEN* in Column (3) of Table 3 (0.120), which is equal to an increase of 0.0516 (5.16%) in cash holdings.

Table 4.5 International financial centres and corporate cash holdings (H2).

Variables	**Model (1)**	**Model (2)**	**Model (3)**
	CASH_TA	*CASH_NA*	*CASH_LN*
Constant	0.977***	1.731***	2.860**
	(8.91)	(6.12)	(2.54)
FIN_CEN	**0.012****	**0.024***	**0.120****
	(2.17)	**(1.76)**	**(2.27)**
SIZE	-0.068***	-0.128***	-0.634***
	(-11.45)	(-8.99)	(-11.60)
BTM	-0.052*	-0.035	-0.809***
	(-1.79)	(-0.54)	(-2.72)
LEV	-0.101***	-0.237***	-0.786***
	(-4.09)	(-3.97)	(-3.23)
ROA	-0.033***	-0.075***	-0.280***
	(-2.92)	(-2.76)	(-3.10)
PPE	-0.052***	-0.128***	-0.408***
	(-3.17)	(-3.08)	(-2.61)
UTB	-0.192	-0.861*	-1.484
	(-1.03)	(-1.72)	(-0.85)
LOSS	-0.004	-0.008	-0.043
	(-0.95)	(-0.80)	(-0.95)
DIV	0.018	0.050*	0.251**
	(1.36)	(1.75)	(2.10)
BD_Qual	-0.007	-0.008	-0.086
	(-1.04)	(-0.54)	(-1.18)
IND	-0.039**	-0.102***	-0.186
	(-2.56)	(-2.78)	(-1.25)
BIG4	0.006	0.001	0.109**
	(0.95)	(0.09)	(1.96)
AGE	-0.010	0.001	0.538*
	(-0.34)	(0.01)	(1.91)
FIRM FE	YES	YES	YES
YEAR FE	YES	YES	YES
Adj. R-sq	0.805	0.752	0.788
N	2,686	2,686	2,686

The table presents the fixed effects regression results on the effect of financial centres on corporate cash holdings. The dependent variable, *CASH*, is measured using three specifications (*Cash_TA*, *Cash_NA*, and *Cash_LN*). The variable of interest, *FIN_CEN*, is an indicator variable that equals to 1 if the firm has at least one subsidiary company incorporated in an OECD (2006) listed tax haven, 0 otherwise. All control variables are defined in Appendix A. Coefficient estimates are reported with *t*-statistics in parentheses. Statistically significant of the estimates are denoted with asterisks: ***, **and* correspond to 1%, 5% and 10% levels of significance, respectively.

4.5.1.3. The association between transfer pricing agreement and corporate cash holdings

Table 4.6 reports the regression results that examine the relationship between the existence of a transfer pricing agreement with a tax authority and corporate cash holdings. A negative and significant coefficient for *TP_AGR* (*p*-value < 0.01) is evident for all three specifications of cash (*CASH_TA*, *CASH_NA*, and *CASH_LN*), suggesting that stricter regulations will increase the cost of transfer mispricing and will be effective in curbing the extent of profit-shifting activities. In another words, if a multinational firm faces strict and enforced transfer pricing regulations this will discourage it from shifting income out of the country, leading to a decrease in the level of corporate cash holdings. In terms of economic significance, a one standard deviation increase in existence of a transfer pricing agreement *(TP_AGR)* results in a decrease in cash holdings by 18.98%.[11] This result provides support for H3. The existence of a transfer pricing agreement (*TP_AGR)* generating greater monitoring and conformity with regulations will decrease the level of firm cash holdings. This finding suggests that a transfer pricing agreement with a tax authority plays an important role in mitigating the negative effects of transfer pricing aggressiveness.

[11] The economic effect is computed as one standard deviation of *TP_AGR* (0.37) multiplied by coefficient of *TP_AGR* in Column (3) of Table 4 (-0.513) which is equal to a decline of -0.1898 (18.98%) in cash holdings.

Table 4.6 Transfer pricing agreement and corporate cash holdings (H3).

Variables	**Model (1)**	**Model (2)**	**Model (3)**
	CASH_TA	*CASH_NA*	*CASH_LN*
Constant	0.981***	1.732***	2.922***
	(8.97)	(6.18)	(2.59)
TP_AGR	**-0.042*** **	**-0.066*** **	**-0.513*** **
	(-3.44)	**(-2.59)**	**(-5.70)**
SIZE	-0.068***	-0.128***	-0.635***
	(-11.26)	(-8.91)	(-11.44)
BTM	-0.054*	-0.039	-0.827***
	(-1.84)	(-0.60)	(-2.76)
LEV	-0.101***	-0.236***	-0.791***
	(-4.05)	(-3.97)	(-3.21)
ROA	-0.032***	-0.074***	-0.275***
	(-2.87)	(-2.74)	(-3.03)
PPE	-0.053***	-0.130***	-0.417***
	(-3.17)	(-3.06)	(-2.64)
UTB	-0.194	-0.872*	-1.457
	(-1.03)	(-1.75)	(-0.83)
LOSS	-0.004	-0.007	-0.041
	(-0.87)	(-0.72)	(-0.90)
DIV	0.018	0.051*	0.257**
	(1.39)	(1.77)	(2.14)
BD_Qual	-0.007	-0.008	-0.086
	(-1.05)	(-0.56)	(-1.19)
IND	-0.040***	-0.104***	-0.202
	(-2.65)	(-2.85)	(-1.36)
BIG4	0.006	0.002	0.112**
	(0.98)	(0.10)	(2.00)
AGE	-0.006	0.008	0.573**
	(-0.21)	(0.13)	(2.02)
FIRM FE	YES	YES	YES
YEAR FE	YES	YES	YES
Adj. R-sq	0.805	0.752	0.788
N	2,686	2,686	2,686

The table presents the fixed effects regression results on the effect of transfer pricing agreement on corporate cash holdings. The dependent variable, *CASH*, is measured using three specifications (*Cash_TA*, *Cash_NA*, and *Cash_LN)*. The variable of interest, *TP_AGR*, is a binary variable coded 1 if the corporation has a transfer pricing agreement with tax authorities, and 0 otherwise. All control variables are defined in Appendix A. Coefficient estimates are reported with *t*-statistics in parentheses. Statistically significant of the estimates are denoted with asterisks: ***, **and* correspond to 1%, 5% and 10% levels of significance, respectively.

4.6 Endogeneity Tests

4.6.1 Propensity Score Matching (PSM) Analysis

To address concerns that the regression coefficients of the main model could be subject to self-selection bias, propensity score matching (PSM) analysis is employed (Armstrong, Blouin and Larcker 2012; Lennox, Lisowsky and Pittman 2013). Following Shipman, Swanquist, and Whited (2017), all control variables are included in the first-stage regression model designed to compute propensity scores, or predicted values for each firm-year observation. The dependent variable *CASH_TA* is the ratio of cash and marketable securities to total assets as an asset-weighted average of firm-level cash ratios. Using the nearest-neighbour method, the treatment and control firm-year observations are matched based on comparable propensity scores. Table 4.7 shows the covariates between the treatment and control groups following the matching process. As covariate equilibrium between treatment and control groups is the goal of propensity score matching (Hainmueller 2012), I find there is no statistically difference between the variables in the two groups.

The second-stage regression results of the PSM sample are reported in Panel B of Table 4.7. The coefficients of *Non_ARM* and *FIN_CEN* are positively and significantly related to *CASH_TA* (p<0.1), indicating that the existence of offshore financial centres and of non-arm's-length transactions will facilitate the use of transfer pricing to minimize tax payments by shifting income from higher- to lower-tax countries in order to generate higher cash tax savings. These PSM results further support the main findings reported in Tables 2 and 3. In addition, the coefficient of *TP_AGR* is negatively and significantly related to *CASH_TA* (p<0.1), suggesting that stricter regulations will increase the cost of transfer mispricing and will be effective in curbing the extent of profit-shifting activities. This finding indicates the robustness of the main findings reported in Table 4.4.

Table 4.7 Propensity score matching (PSM) analysis

Panel A: Covariate balance test

Variable	*Treated*	*Control*	*t*
SIZE	8.81	8.78	0.52
BTM	0.28	0.27	1.00
LEV	0.58	0.57	0.60
ROA	0.97	0.96	0.87
PPE	0.55	0.54	1.55
UTB	0.01	0.01	-0.41
LOSS	0.15	0.14	0.41
DIV	0.23	0.23	-0.46
BD_Qual	3.35	3.36	-0.80
IND	0.72	0.73	-0.96
BIG4	0.72	0.71	0.32
AGE	4.14	4.14	0.15

Panel B: Second stage regression results

Variables	**Model (1)**	**Model (2)**	**Model (3)**
	CASH_TA	*CASH_TA*	*CASH_TA*
Constant	0.993***	1.021***	1.031***
	(7.74)	(10.10)	(8.15)
Non_ARM	**0.036****		
	(2.41)		
FIN_CEN		**0.011****	
		(2.22)	
TP_AGR			**-0.043*****
			(-4.95)
SIZE	-0.065***	-0.066***	-0.065***
	(-10.64)	(-16.31)	(-10.68)
BTM	-0.075**	-0.072***	-0.074**
	(-2.56)	(-3.30)	(-2.54)
LEV	-0.083***	-0.085***	-0.085***
	(-3.24)	(-4.53)	(-3.31)
ROA	-0.031***	-0.031***	-0.030***
	(-2.66)	(-4.53)	(-2.64)
PPE	-0.059***	-0.058***	-0.059***
	(-3.40)	(-4.95)	(-3.41)
UTB	-0.215	-0.203	-0.198
	(-1.12)	(-1.30)	(-1.03)
LOSS	-0.005	-0.006	-0.006
	(-1.21)	(-1.49)	(-1.34)
DIV	0.019	0.019*	0.019
	(1.36)	(1.79)	(1.35)
BD_Qual	-0.013*	-0.013*	-0.013*
	(-1.77)	(-1.92)	(-1.74)
IND	-0.043***	-0.041***	-0.044***
	(-2.72)	(-2.99)	(-2.75)
BIG4	0.008	0.008	0.008
	(1.23)	(1.51)	(1.29)
AGE	-0.019	-0.020	-0.019
	(-0.58)	(-0.89)	(-0.57)
FIRM FE	YES	YES	YES
YEAR FE	YES	YES	YES
Adj. R-sq	0.800	0.800	0.800
N	2,523	2,523	2,523

This table reports the results of PSM analysis. Variable definitions are in Appendix A. Coefficient estimates with *t*-statistics reported in parentheses. The statistical significance of the estimates is denoted with asterisks: ***, ** and * correspond to 1%, 5% and 10% levels of significance, respectively.

4.6.2 Difference-in-Difference Procedure

This study exploits the introduction of FIN 48 [12]Accounting for Uncertainty in Income Taxes, introduced in 2006, and it is a requirement for firms to report these uncertainties by the Internal Revenue Service (IRS) from 2010. Specifically, the introduction of FIN 48 rules is exploited as an exogenous event to assess whether the relationship between *Non_ARM* and firms cash holdings changed after 2010 (Abernathy, Davenport and Rapley 2013). I conjecture that increased transparency in uncertain tax positions, most of which relate to income increasing transfer pricing arrangements, increased transparency and greater rigour around reporting the commerciality of transactions between related parties. This reduces insiders' information advantage and hence their ability to profit from use and manipulation of the terms and conditions of related party transactions.

This study includes an indicator variable (*DID*) to denote the exogeneous shock, coded as 1 for years after 2010 and 0 before 2010. The *DID* variable is also interacted with *Non_ARM*, and the regression results are provided in Table 4.8. It is found that the variable of interest, *Non_ARM*, is significantly and positively related to cash holdings, indicating that manipulation of related party transactions gave rise to higher levels of cash holdings in the years prior to 2010. However, the coefficients of *DID* are positively significant at $p<0.10$, but the coefficients of the interaction term, *Non-ARM*DID*, are insignificant. The results suggest that with the requirement to report tax positions, the profitability and cash holdings generated from non-arm's-length transactions are not effective in the period after 2010.

[12] For more information, see: https://www.fasb.org/page/getarticle?uid=fasb_NewsRelease03-20-12Body_0228221200

Table 4.8 Difference-in-difference (DID) test

Variables	**Model (1)**	**Model (2)**	**Model (3)**
	CASH_TA	*CASH_NA*	*CASH_LN*
Constant	0.906***	1.648***	2.040*
	(8.35)	(5.91)	(1.84)
Non_ARM	0.033**	0.020	0.521*
	(2.03)	(0.71)	(1.87)
DID	0.035***	0.050*	0.298**
	(2.95)	(1.87)	(2.52)
Non_ARM*DID	**0.007**	**0.019**	**0.112**
	(0.80)	**(0.82)**	**(1.34)**
SIZE	-0.068***	-0.127***	-0.632***
	(-11.19)	(-8.87)	(-11.39)
BTM	-0.054*	-0.040	-0.837***
	(-1.86)	(-0.61)	(-2.79)
LEV	-0.100***	-0.234***	-0.771***
	(-3.99)	(-3.93)	(-3.13)
ROA	-0.032***	-0.074***	-0.273***
	(-2.86)	(-2.73)	(-3.02)
PPE	-0.052***	-0.128***	-0.403**
	(-3.10)	(-3.01)	(-2.55)
UTB	-0.206	-0.889*	-1.589
	(-1.09)	(-1.78)	(-0.90)
LOSS	-0.003	-0.007	-0.036
	(-0.79)	(-0.69)	(-0.80)
DIV	0.017	0.050*	0.245**
	(1.32)	(1.71)	(2.03)
BD_Qual	-0.007	-0.008	-0.083
	(-1.03)	(-0.53)	(-1.14)
IND	-0.040***	-0.103***	-0.196
	(-2.61)	(-2.82)	(-1.31)
BIG4	0.006	0.001	0.108*
	(0.93)	(0.07)	(1.95)
AGE	-0.007	0.005	0.553*
	(-0.25)	(0.07)	(1.95)
FIRM FE	YES	YES	YES
YEAR FE	YES	YES	YES
Adj. R-sq	0.805	0.752	0.788
N	2,686	2,686	2,686

This table reports the regression results using a DID indicator variable which equals to 1 for years after 2010, and 0 otherwise, to take into account the change in reporting requirement of FIN48 by IRS since 2010. All variables are defined in Appendix A. Coefficient estimates with *t*-statistics reported in parentheses. The statistical significance of the estimates is denoted with asterisks: ***, ** and * correspond to 1%, 5% and 10% levels of significance, respectively.

4.7 Conclusion

This study investigates the association between non-arm's-length transactions, offshore financial centres, transfer pricing agreements and corporate cash holdings for a large sample of US multinational corporations over the 2006–2020 period. It provides evidence that the existence of non-arm's-length transactions and of offshore financial centres increases corporate

cash holdings. However, when firms have a transfer pricing agreement with tax authorities, the level of firm cash holdings is substantially reduced. Overall, the results suggest that constraining transfer pricing aggressiveness through various regulatory mechanisms is capable of deterring multinational companies from shifting profits from higher- to lower-tax countries.

This study contributes to the growing body of literature on transfer pricing agreement and corporate cash holdings. To the best of my knowledge, this is the first study designed to explore the association between non-arm's-length transactions, offshore financial centres, transfer pricing agreements and corporate cash holdings. This study also uses unique hand-collected data on transfer pricing from firms' annual reports. In addition, the paper examines the effectiveness of transfer pricing agreement as there is a lack of research on this in the existing literature. Finally, the results of this study should also be of interest to academics and policymakers in considering the potential implications of the recent significant reduction in the US corporate tax rate in response to the AJCA and territorial tax system. The results also encourage governments to adopt stricter regulations in order to mitigate adverse effects of transfer pricing aggressiveness.

Chapter Five

Conclusion

5.1 Introduction 124
5.1 Summary of Major Findings 124
5.2 Recommendations to policymakers, regulators and investors 128
5.3 Limitations of the study 129
5.4 Directions for Future Research 130

5.1 Introduction

Recently, profit shifting by MNCs has become more prominent in taxation policy debates. Profit shifting by MNCs has cost the US government considerable revenue in recent years. As a result of these potential issues, waves of reactions have arisen around the world against the practice of income shifting. For example, in 2015, the OECD countries agreed to jointly reduce the extent of profit shifting via the Base Erosion and Profit Shifting (BEPS) project. Also there has been increased interest in it from politicians as well as the popular press for "naming and shaming" many familiar multinational companies, such as Apple and Amazon, for paying too little tax.

As part of this thesis, three essays address several important questions. The first essay (in Chapter 2) examines the potential effect of income-shifting incentives on share repurchases. The second essay (in Chapter 3) investigates whether income shifting by the US MNCs is associated with the likelihood of financial restatements. The third essay (in Chapter 4)examines the association between non-arm's-length transactions, the existence of offshore financial centres, the existence of a transfer pricing agreemenst and corporate cash holdings fora large sample of the US MNCs.

5.2 Summary of Major Findings

In this thesis, Chapter 2 presents the findings of the first essay, which examined the potential effect of income-shifting incentives on share repurchases. A large hand-collected sample of firms over the period of 2006–2021 is used to provide evidence of a negative association between income-shifting incentives and share repurchases. Moreover, this study finds that the negative relationship between income shifting and share repurchases is increased in firms with a high tax cost of repatriating earnings. However, MNCs with an advance pricing agreement have positive association with share repurchases.

Chapter 3 of this thesis investigates whether income shifting by the US MNCs is associated with the likelihood of financial restatements. It also examines whether the existence of tax havens, level of research and development, and accruals quality moderates the association between income shifting and the likelihood of restatements. A large sample of the US MNCs over the period of 2006–2019 is used to test hypotheses. This study finds a positive and significant association between income shifting and restatements. It also finds that the existence of tax havens, research and development, and accruals quality moderates the positive association between income shifting and restatements. Further, these results are robust based on the Generalised Method of Moments (GMM) and models that employ additional control variables, thereby mitigating potential endogeneity and omitting variable bias concerns.

Chapter 4 of this thesis examines the association between non-arm's-lengthtransactions, the existence of offshore financial centres, the existence of a transfer pricing agreement and corporate cash holdings for a large sample of the US MNCs over the 2006– 2020 period. This study provides evidence of the existence of non-arm's-length transaction andoffshore financial centres increasing the level of corporate cash holdings. In contrast, the existence of a transfer pricing agreement reduces the level of cash holdings. These results are robust across a series of endogeneity and selection bias tests including propensity score matching (PSM), generalized method of moments (GMM) and difference-in-Ddifference (DID).

5.3 Recommendations to policymakers, regulators and investors

This research will be concluded with some recommendations of the findings from the research. The results of this essay should be of interest to academics and policymakers in considering the potential implications of the recent significant reduction in the US corporate tax rate in response to the TCJA and territorial tax system. Also, the results of this study should be of interest to regulators in auditing, financial reporting and taxation. As the proportion of financial statement restatements motivated by tax-related

issues continues to increase, I believe that it is important from a policyperspective to mitigate opportunities for income-shifting activities by MNCs and also improvethe coherence of international tax rules and ensure the transparency of tax environments acrosscountries and jurisdictions. In addition, a tax-motivated accounting restatement can alert regulators and the Internal Revenue Service (IRS) of potential deficiencies associated with a corporation's aggressive financial reporting related to the corporation's income tax liability. Inaddition, this study is also useful for shareholders and investors. Given that income shifting increases restatement, shareholders and investors can view abnormalities in a firm's income- shifting activities as potential red flags and can demand additional risk premiums from firms engaging in income shifting. Finally, this study also can inform the broader policy about crucial reforms to the US tax system by extending the knowledge of how APAs and theTCJA affect repatriation behaviour and corporate cash holdings. This study finds a negative and significant association between transfer pricing agreements with tax authorities andcorporate cash holdings, which indicates that stronger regulations such as APAs and the TCJAwill reduce repatriation risk, trapped cash risk and litigation risk. Moreover, the findings of this study may inform governmentsto adopt more strict regulations in order to mitigate adverse effects of transfer pricing aggressiveness.

5.4 Limitations of the study

Although this thesis was well prepared, reached its aims, however, there are some limitations which provide abundant room for further research. Due to the limitations of determined time for my scholarship and COVID-19 period as well, the main data were collected manually within a relatively short time period. Having more time to collect data, read, ponder, and analyze would have been beneficial when developing models. Extending the data period would help to cover the majority of public listed firms in us especially after new tax reform and enhance the generalizability of our

findings. The selection of this data are only limited for non-financial listed firms since we exclude, for example, financial firms from our sample, which may account for some of the discrepancies among findings

5.5Directions for Future Research

The findings from this thesis provide insights for academics, regulators, and shareholders relating to the financial effects of aggressive transfer pricing arrangements and transactions. The findings contribute to an understanding of the US MNCs activities such as income shifting. The first essay's findings show that there is a negative association between the income-shifting incentives and share repurchases. The new tax reform, TCJA 2017, lowersthe federal corporate income tax rate from 35% to 21% and it was designed to stimulate the economy through supply-side incentives. Additionally, the TCJA established a territorial system of eliminating taxes on repatriation of actively earned profits by foreign subsidiaries to the United States parent companies, protecting the integrity of the territorial system, reducing profit shifting, and encouraging companies to locate profit centres and real activity within the United States. It is well known that new tax reform could influence United States MNCs' income-shifting activities. Future research could cover more years following the TCJA to further examine the impact of new tax reforms on the decision of the US MNCs' engaging toinincome shifting; since the period under examination in this essay finishes in 2021, it covers only 3 years after the TCJA. Moreover, the three essays in this thesis explore channels that moderate the association for each essay. Future research can focus on exploring more channels affecting the association of income-shifting incentives, share repurchases, financial restatements, non-arm's-length transactions, offshore financial centres, transfer pricing agreements and corporate cash holdings. Future studies could also examine this effect before and during the COVID-19 period.

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Appendix A: Variable Definitions and Measurement

Variables	Definitions
Dependent variables	
Rep1	Purchase of common and preferred stock minus the reduction in the book value of preferred stock, all scaled by total assets.
Rep2	Purchase of common and preferred stock minus the reduction in the book value of preferred stock, all scaled by sales.
REST	A dummy variable that takes a value of 1 if the firms announce a restatement in year $_t$, 0 otherwise.
CASH_TA	The ratio of cash and marketable securities to total assets as an asset-weighted average of firm-level cash ratios.
CASH_NA	The ratio of cash and marketable securities to net assets, where net assets are the total assets minus cash and marketable securities.
CASH_LN	The natural logarithm of cash and marketable securities to total assets.
Independent variables	
INCS	Fractional reduction in the US statutory tax rate (STR) due to lower (weighted average) foreign tax rates. INCS is computed as follows: $INCSit = \frac{WAVG\ FTRit}{STRit}$, (1)
INCS_ln	The natural logarithm of fractional reduction in the US statutory tax rate (STR) due to lower (weighted average) foreign tax rates. INCS is computed Richardson et al. (2021)as follows: $INCSit = \frac{WAVG\ FTRit}{STRit}$, (1)
INCS_D	Dummy variable, coded 1 if *INCS* negative, and 0 otherwise.
Non_ARM	A dummy variable, coded as 1 if related-party transactions are not described as being on normal commercial terms, 0 otherwise
FIN_CEN	A dummy variable that equals to 1 if the firm has at least one subsidiary company incorporated in an OECD (2006) listed tax haven, 0 otherwise.
TP_AGR	A dummy variable coded 1 if the corporation has a transfer pricing agreement with tax authorities, 0 otherwise.
Control variables	
Cash flow	Operating income before depreciation (OIBDP) over total assets (AT).
Retained earnings	Retained earnings (RE) over total assets (AT).
Idiosyncratic risk	Standard deviation of the residuals from a regression of the daily stock return (source: CRSP) in excess of the risk-free rate (from Kenneth French's website) on the market factor based on the value-weighted market return (source: CRSP). Daily returns over the fiscal year are used.

Systematic risk	Standard deviation of the predicted value from a regression of the daily stock return in excess of the risk-free rate on the market factor based on the value-weighted market return (source: CRSP). Daily returns over the fiscal year are used.
SIZE	The natural logarithm of total assets ln (AT_{t-1}).
Capital expenditure	Capital expenditures divided by gross property, plant, and equipment.
Age	Log of one plus the number of years since the firm's first appearance in CRSP
MTB	Firm market value over total assets (AT). Firm market value is total assets minus book equity plus market capitalization. Book equity is stockholders' equity (SEQ) or book common equity (CEQ) plus book preferred stock (PSTK) or total assets (AT) minus total liabilities (LT), minus preferred stock (defined below), plus deferred taxes and investment tax credit (TXDITC), if available, minus the postretirement benefit asset (PRBA), if available. Preferred stock is the liquidating value of preferred stock (PSTKL) or the redemption value of preferred stock (PSTKRV) or the par value of preferred stock (PSTK). If items PSTKL, PSTKRV, and PSTV are not available, preferred stock is set to zero. Market capitalization is stock price times the number of outstanding shares (PRCC times CSHO).
Negative earnings	Binary variable that is equal to one if earnings before interest are negative, otherwise zero. Earnings before interest is income before extraordinary items (IB) plus interest and related expenses (XINT), if available, plus income statement deferred taxes (TXDI), if available
LEV	Total liabilities (LT) over total assets (AT)
ROA	Return on assets (PI_{t}-SPt/AT_{t-1})
Cash	Cash and short-term investments (CHE) over total assets (AT).
SALEG	Percentage change in sales from the prior year, (($SALE_t$-$SALE_{t-1}/SALE_{t-1}$).
LOSS	A dummy variable that takes a value of 1 if net income is negative (NI_t,< 0), 0 otherwise.
MERGER	A dummy variable that takes a value of 1 if the company had an acquisition that contributed to sales (AQS_t>0), 0 otherwise.
EPR	Earnings-to-price ratio, defined as net income (Ni_t) scaled by market capitalization at the end of the year (Ni_t/ ($PRCC\_F_t$*$CSHO_{t-1}$)).
BD	The natural logarithm of the total number of board members.
BUSY	(busy) Natural logarithm of total number of external board directorships
BIG4	A dummy variable that takes a value of 1 if the client is audited by one of the Big 4 accounting firms, zero otherwise. Audit Analytics ($AUDITOR\_NAME_t$).
DIV	An indicator variable that equals to 1 if the firm pays a dividend in a given year, 0 otherwise.
PPE	Property, plant, and equipment (PPENT) for firm *i*, year *t*, scaled by lagged assets (AT).
UTB	The natural logarithm of total uncertain tax benefits (UTBs) that a firm accrues.
BD_Qual	The natural logarithm of total number of qualifications of board members.
IND	The proportion of total independent directors to total board size.

Moderation variables

THAV	a dummy variable that equals 1 if the firm has at least one subsidiary company incorporated in an OECD (2006) listed tax haven, and 0 otherwise.
R&D	the natural logarithm of research and development expenditure scaled by the natural logarithm of total assets.

AQ	total accruals model
Additional Control variables	
AUDF	Natural log of one plus total audit fees in millions
AUDI	Ratio of nonaudit service fees to total audit and nonaudit service fees
REC	Ratio of receivables and inventory to total assets
QUICK	Ratio of current assets less inventory to current liabilities
LIT	Indicator variable equal to one if the firm operates in a high-litigation industry and zero otherwise, where high litigation industries are those with SIC codes of 2833–2836, 3570–3577, 3600–3674, 5200–5961, and 7370