School of Accounting, Economics and Finance

Three Essays on Tax Avoidance, Audit Pricing and Asymmetric Cost Behaviour: Evidence from M&A Activities in the U.S.

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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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Meshal Aldaham

28th March 2022

Abstract

This thesis is comprised of three essays that examine the relationship between mergers and acquisitions (M&As) and corporate tax avoidance, audit pricing and asymmetric cost behaviour. M&As are significant in the business landscape of the United States of America, with a growth in the number of transactions, both in volume and value, during the last two decades. For instance, the value of worldwide M&A transactions reached $3.9 trillion in 2018, up 15.9% from the previous year's figure[1]. Furthermore, 14,143 M&A deals of US$2.03 trillion were executed in the 12-month period ending 30 June 2019[2]. The United States was the most acquisitive country in the first quarter of 2020, accounting for 45% of global private equity activity, and the $18.9 billion sale of ThyssenKrupp Elevator AG was the region's largest private equity transaction[3].

The first chapter of this thesis documents the introduction and includes the objectives of this research. This chapter also details the motivation for contribution, and structure of the thesis. The second chapter presents the first essay titled "Acquisition activity and corporate tax avoidance: Evidence from US firms". This study examines the relationship between M&A activities and tax avoidance in a large sample of U.S. firms over the period of 1990–2019. It determines that the occurrence of M&A deals is positively and significantly related to corporate tax avoidance during the year of M&A deals, as well as the following year. This study finds three channels that moderate the relationship between M&A deals and corporate tax avoidance: agency costs, managerial resource diversion, and audit pricing. It employs difference-in-difference analysis (DID) and finds that the IRS Repurchase Legislation (IRS 2007–48) introduced on 31 May 2007, could potentially limit the engagement of acquiring firms in tax avoidance activities. In addition, the positive association of M&A deals and corporate tax avoidance is significantly increased in firms with higher levels of agency costs, managerial resource diversion and audit pricing. The results are robust across a series of endogeneity and selection bias tests including propensity score matching (PSM) and the Heckman's test.

The third chapter of this thesis is titled "The influence of restatements on audit pricing for firms engaging in M&A activities: Evidence from U.S. firms". This paper investigates the relationship

[1] Bloomberg. " Global M&A Market Review 2018." Retrieved 26 May 2021, from https://data.bloomberglp.com/professional/sites/10/Bloomberg-Global-MA-Legal-Ranking-Q1-2018.pdf. https://data.bloomberglp.com/professional/sites/10/Bloomberg-Global-MA-Legal-Ranking-1st-3Q2018.pdf

[2] Factset. "US M&A News and Trends." Retrieved 26 May 2020, from https://www.factset.com/hubfs/mergerstat_em/monthly/US-Flashwire-Monthly.pdf

[3] Bloomberg. "Global M&A Market Review Q1 2020." Retrieved 27 May 2021, from https://data.bloomberglp.com/professional/sites/10/Bloomberg-Global-MA-Financial-League-Tables-1Q-2020.pdf. https://www.bloomberg.com/press-releases/2020-04-01/bloomberg-global-m-a-mid-market-legal-rankings-q1-2020

between M&As and audit pricing in a large sample of U.S. firms over the period of 2000–2019. Its findings suggest that the occurrence of M&A deals is positively and significantly related to audit fees in the current and subsequent year following M&As. Additionally, that study indicates that firms engaging in M&A activities and subject to financial restatements incur significantly higher audit fees. This effect is driven by the occurrence of restatements related to accounting rule application failures, restatements related to adverse effects in financial statements (financial statement materiality), or restatements related to errors in accounting and clerical applications. This association is moderated by strength of internal control material weakness restructures (ICMW), level of audit quality (Big4), geographical location of audit offices, and agency effects. It determines that the level of audit fees in acquiring firms with financial restatements is significantly higher in firms with an ICMW, in firms that employ non-Big4 auditors, or in firms headquartered in a geographic location different from that of their auditors, and in firms that exhibit higher levels of agency costs. These results are robust to alternative measures of audit fees and endogeneity tests that include propensity score matching (PSM), a Heckman's selection bias and a difference-in-difference (DID) test.

The fourth chapter of this thesis is titled "The influence of firm life cycle on the asymmetric cost behaviour of U.S. acquiring firms". It investigates the relationship between firm life cycle and asymmetric cost behaviour (cost stickiness) in U.S. firms undertaking M&As over the period of 1990–2019. This study finds that M&A firms have lower levels of cost stickiness when compared with non-M&A firms. The study further investigates whether corporate life cycle development is related to the cost stickiness behaviour of M&A firms. It finds that acquiring firms in the introduction and decline stages of life cycle development have high levels of cost stickiness, whilst firms in the growth, mature and shakeout stages exhibit anti-stickiness cost behaviour. In additional analyses, it is shown that two channels (i.e., the level of capital expenditure, and research and development) influence the cost stickiness of acquiring firms across different stages of firm life cycle. The results are robust across a series of endogeneity and selection bias tests including propensity score matching (PSM), generalised method of moments (GMM) and difference-in-difference (DID).

Finally, chapter five provides conclusions and outlines directions for future research.

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Dedication

I dedicate this effort to my spectacular father, my caring mother, and to my brothers and sisters.

Publications Arising from this Research

Referred Conference Articles

Aldaham, M., Duong, L. and Taylor, G. (2021). Acquisition activity and corporate tax avoidance: Evidence from U.S. firms. FMCG Conference, 9-10 April 2021, Sydney, Australia.

Journal Submission

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List of Abbreviations

M&As	Mergers and Acquisitions
FMCG	Financial Markets and Corporate Governance Conference
FIN 48	Financial Interpretation No. 48
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
UTB	Unrecognised Tax Benefit
CASH ETR	Cash effective tax rate
DID	Difference-in-difference test

Chapter One

1

Introduction

1.1 Background and Motivation

Mergers and acquisitions (M&As) have become a common strategy among many businesses, attracting the attention of academic researchers and business experts. Although the terms "merger" and "acquisition" are nearly interchangeable, they have distinct meanings. A merger is "an acquisition that takes place with the approval of the board of directors of the acquired firm" (Stewart et al. 1963). A merger is "a marriage of two firms, generally of similar size and with an innate propensity to cooperate" (Jones 1982). Bengtsson (1992) uses a pragmatic approach, claiming that most businesses use the words loosely and interchangeably, and that they are more likely to choose a phrase that would be well regarded by the business community, confuse competitors, and safeguard their goods. Overall, "acquisition" refers to a mostly friendly transaction in which both parties cooperate; "takeover" refers to a situation in which the target firm resists or strongly opposes the acquisition; and "merger" refers to a situation in which the acquiring and target firms merge to form a completely new entity (Stewart et al. 1963, Bengtsson 1992). Nonetheless, since each acquisition, takeover, and merger is a unique instance with its own set of features and motivations for completing the deal, these phrases are frequently used interchangeably. The terms 'merger and acquisition' are used interchangeably to describe a change in firm ownership without referring to the terms of the transaction (i.e. it might be either a merger or an acquisition). In this thesis, the terms 'merger and acquisition' or 'takeover' will be used to refer to the favourable merger of two or more businesses.

Ultimately the long-running operation via Vodafone's AirTouch PLC to acquire German telecom giant Mannesmann AG in 2000 with $180.95 billion was accepted, making this acquisition the biggest M&A deal in history[4]. The merger of America Online (AOL) and Time Warner Inc. with a value of $165 billion is ranked as the second largest merger in history. The merger took place in 2000, during the height of the dotcom boom, when successful Internet provider AOL launched a proposal to purchase mass media behemoth Time Warner. At the time, AOL had a significant market share and was hoping to expand even further by capitalising on Time Warner's dominance in publishing, entertainment, and journalism[5]. The period of the 1990s will be remembered as the decade of the internet bubble and the megadeal in the U.S. corporate landscape. In particular, the late 1990s saw a succession of multibillion-dollar purchases not seen on Wall Street since the 1980s junk bond fests. For instance, Yahoo acquired Broadcast.com in 1999 with a value of $5.7 billion[6], and AtHome

[4] The Wall Street Journal. "Vodafone, Mannesmann Set Takeover At $180.95 Billion After Long Struggle." https://www.wsj.com/articles/SB949581016407171705. Accessed February 02, 2022.

[5] Fortune. "15 Years Later, Lessons from the Failed AOL-Time Warner Merger." https://fortune.com/2015/01/10/15-years-later-lessons-from-the-failed-aol-time-warner-merger/. Accessed February 02, 2022.

[6] CNN Money. "Yahoo! Buying BCST.com." https://money.cnn.com/1999/04/01/deals/yahoo/. Accessed February 02, 2022.

acquired Excite with a value of $7.5 billion over the "growth now, profit later" scenario[7]. Global M&A volumes surpassed $5 trillion in 2021 for the first time, well above the previous high of $4.55 trillion achieved in 2007[8]. The total value of mergers and acquisitions was $5.8 trillion, up 64% from the previous year[9]. Despite a stricter anti-trust environment under the Biden administration, the U.S. has led the way in M&As, accounting for about half of worldwide volumes, and the value of M&As was nearly doubled to $2.5 trillion in 2021.

Many companies engage in M&As as important strategic undertakings. M&A transactions have been utilised for boosting revenue, expanding into new markets, and dispersing risk. During the previous decade, M&As have been recognised as the preferred method of expanding into the worldwide market and business portfolio (Lodorfos and Boateng 2006, Srivastava 2012). On the other hand, managerial power theory argue that M&As can be used by managers for "empire building" due to narcissism or herd behaviour (Jensen and Meckling 1976, Jensen 1986, Scharfstein and Stein 1990, Hayward and Hambrick 1997, Hope and Thomas 2008). Under this point of view, executives of acquiring companies can behave in ways that profit them the most, but such activities may not be in the best interests of shareholders, resulting in value-destroying acquisitions (Jensen 1986, Stulz 1990, Masulis et al. 2007, Hope and Thomas 2008, Chintrakarn et al. 2018).

Previous research has shown that agency issues can be a motivator for businesses to engage in corporate tax avoidance, as CEOs are more prone to overinvest for their own personal benefit (Chen and Chu 2005, Crocker and Slemrod 2005, Desai and Dharmapala 2006). Jensen and Ruback (1983) argue that managers' decisions to engage in M&As may be motivated by financial considerations, such as the opportunity to fully utilise tax shelters, enhance leverage, and take advantage of other tax benefits (Devos et al. 2009). According to Kaplan (1989), tax savings are a significant source of wealth gains in publicly traded company management buyouts. A recent study by Hanlon and Heitzman (2010) identified a number of elements leading to corporate tax avoidance. However, Hanlon and Heitzman (2010) also demonstrated that further research is needed to properly identify probable linkages between corporate tax avoidance and business restructuring incentives and results. Therefore, the second chapter of this thesis explores some intriguing findings on the association between M&A activities and tax avoidance.

[7] Wall Street Journal. "AtHome Agrees to Acquire Excite In Stock Deal Valued at $7.5 Billion." https://www.wsj.com/articles/SB916714648524515000. Accessed February 03, 2020.

[8] Reuters. "Global M&A volumes hit record high in 2021, breach $5 trillion for first time." https://www.reuters.com/markets/us/global-ma-volumes-hit-record-high-2021-breach-5-trillion-first-time-2021-12-31/. Accessed February 03, 2020

[9] Reuters. "Global M&A volumes hit record high in 2021, breach $5 trillion for first time." https://www.reuters.com/markets/us/global-ma-volumes-hit-record-high-2021-breach-5-trillion-first-time-2021-12-31/. Accessed February 03, 2020

As a result of M&A activities, it is anticipated that auditor effort (i.e. audit hours and audit fees) will be increased (Firth 2002). This is due to the fact that M&A transactions frequently need modifications to the client's accounting, information, governance, and management structures (Pong and Whittington 1994, Firth 2002). Auditors must use more effort to comprehend how these systems have evolved as a result of such transactions (Firth 2002, Francis 2004). Following the conclusion of the takeovers, auditors will need to become acquainted with the integration of both the accounting information and internal control systems of the target businesses into those of the acquiring firms (Cai et al. 2016). As a result of accounting mistakes, fraud, or irregularities, financial restatements result in changes to accounting transactions and reporting systems (Hennes et al. 2008, Paik et al. 2018, Habib et al. 2020). Previous studies have found a positive association between audit fees and financial restatements, implying that auditors must use more effort to discover errors or omissions that might result in issuing financial restatements (Venkataraman et al. 2008, Feldmann et al. 2009, Asthana and Boone 2012). If errors are discovered later, the increased fees can compensate the auditor for potential lawsuits and/or reputational harm (Simunic and Stein 1996). Prior research suggests that higher audit fees are associated with riskier customers (Bell et al. 2001, Niemi 2002, Hay et al. 2006) and that higher audit fees are incurred by businesses that are less operationally successful and active in acquisition decisions (Fields et al. 2004). Consequently, the third chapter in this thesis investigates the effects of financial restatements on the relationship between M&As and audit fees.

Prior research indicates that businesses engaging in M&As have more constraints than firms that do not engage in M&A activities (Grinstein and Hribar 2004, Bugeja et al. 2012). M&A activities are considered as one of the firm's largest investments with a higher level of adjustment costs, including the cost of the structure for fixed assets or hiring and firing of employees, resulting in increased cost stickiness of the firms (Bentolila and Bertola 1990, Cooper and Haltiwanger 2006). This is expected to have a substantial influence on M&A performance (Jang and Yehuda 2020). As M&A transactions are one of the largest investment choices made by firms, adjustment costs are expected to play a crucial role in producing merger profits and synergies (Jang and Yehuda 2020). Moreover, different acquirers with sticky costs may have varied outcomes in the market for corporate control (Uğurlu et al. 2019). Alexandridis et al. (2010) indicate that market competition is an important influence on the acquiring firms' behaviour and consequences, possibly resulting in higher premiums paid to target firms and decreased acquirer profits. In this aspect, the acquirer's cost stickiness may limit its flexibility in resource adjustment, making post-integration more difficult and limiting acquirer profits (Uğurlu et al. 2019). Furthermore, cost stickiness is an essential cost management concept that may be related to the firm life cycle, as businesses have distinct costing strategies at different phases of growth. Hence, the main objective of chapter four in this thesis is to investigate whether there is any difference in the asymmetric cost behaviour between M&A firms and non-M&A firms. In addition,

it also examines whether the cost stickiness behaviour of acquiring firms varies across different stages of firm life cycle development.

1.2 Summary of the Findings

The second chapter of this thesis provides the results of the first essay, which examines the association between M&A activities and tax avoidance. A large sample of U.S. firms over the period of 1990–2019 is used. The results indicate a positive association between the occurrence of M&A deals and corporate tax avoidance in the years during and immediately following M&As. Moreover, the study finds this relationship to be moderated by agency costs, managerial resource diversion, and audit pricing. The positive association of M&As and corporate tax avoidance is significantly increased in firms with higher levels of agency costs, managerial resource diversion, and audit pricing. This study employs difference-in-difference analysis (DID) and finds the IRS Repurchase Legislation (IRS 2007–48) introduced on 31 May 2007 could have potentially limited the engagement of acquiring firms in tax avoidance activities. These results are robust to alternative measures of corporate tax avoidance and endogeneity tests of propensity score matching (PSM) and Heckman's selection bias.

The third chapter of this thesis examines the association between M&As and audit fees in a large sample of U.S. firms over the period of 2000–2019. This study finds that the occurrence of M&A deals was positively and significantly related to audit fees in the current and subsequent years following occurrences of M&A deals. The study also finds that firms engaging in M&A activities and issuing financial restatements incur significantly higher audit fees. In this study, restatements are separated into few categories, namely, restatements related to accounting rule application failures, restatements related to adverse effects in financial statements (financial statement materiality), or restatements related to errors in accounting and clerical applications. Furthermore, this relationship is moderated by strength of internal control material weakness restructures (ICMW), level of audit quality (Big4), geographical location of audit offices, and agency effects. The level of audit fees in acquiring firms with financial restatements is significantly higher in firms with an ICMW, in firms that employ non-Big4 auditors, in firms headquartered in a geographic location different from that of their auditors, and in firms that exhibit higher levels of agency costs. These results are robust to alternative measures of audit fees and endogeneity tests including propensity score matching (PSM), Heckman's selection bias and difference-in-difference (DID).

The fourth chapter of this thesis examines the association between firm life cycle and asymmetric cost behaviour (cost stickiness) in U.S. firms undertaking M&As over the period of 1990–2019. It finds that M&A firms have lower levels of cost stickiness when compared with non-M&A firms. This

study further examines whether corporate life cycle development is related to the cost stickiness behaviour of M&A firms. The findings indicate that acquiring firms in the introduction and decline stages of life cycle development have high levels of cost stickiness, whilst firms in the growth, mature and shakeout stages exhibit anti-stickiness cost behaviour. Moreover, the study finds that this association is moderated by the level of capital expenditure, and research and development, which influence the cost stickiness of acquiring firms across different stages of the firm life cycle. These results are robust across a series of endogeneity and selection bias tests including propensity score matching (PSM), generalised method of moments (GMM) and difference-in-difference (DID).

Table 1-1 Summary of the Findings

Chapter	Essay	Hypothesis	Findings
2	One	*1.* Firms engaging in M&As are more likely to engage in corporate tax avoidance. *2.* The positive relationship between M&A activities and corporate tax avoidance is increased in firms with higher agency costs. *3.* The positive relationship between M&A activities and corporate tax avoidance is increased in firms with high levels of managerial diversion. *4.* The positive relationship between M&A activities and corporate tax avoidance is increased in firms with higher audit pricing.	- The occurrence of M&A deals is positively and significantly correlated with corporate tax avoidance in the current and following years of M&A deals. - The positive association of M&A deals and corporate tax avoidance is significantly increased in firms with higher levels of agency costs, managerial resource diversion, and audit pricing.
3	Two	*1.* The positive relationship between M&A activities and audit fees is	- Firms engaging in M&A activities and

		magnified in firms with financial restatements. 2. The positive relationship between the interaction of financial restatements and M&A activities and audit fees is moderated by: i. Strength of the internal control material weakness (ICMW) restructures; ii. Level of audit quality; iii. Geographical location of auditor offices; and iv. Agency effects.	issuing financial restatements incur significantly higher audit fees. - The level of audit fees in acquiring firms with financial restatements is significantly higher in firms with an ICMW, in firms that employ non-Big4 auditors, in firms headquartered in a geographic location different from that of their auditors, and in firms that exhibit higher levels of agency costs.
4	Three	1. Cost stickiness behaviour differs between M&A firms and non-M&A firms. 2. Cost stickiness behaviour in acquiring firms varies across different stages of their life cycle progression. 3. The level of capital expenditure is related to the cost stickiness behaviour of acquiring firms differently at different stages of a firm's life cycle progression. 4. The level of R&D expenses is related to the cost stickiness behaviour of acquiring firms	- M&A firms have lower levels of cost stickiness compared with non-M&A firms. - Acquiring firms in the introduction and decline stages of life cycle development have high levels of cost stickiness, whilst firms in the growth, mature and shakeout stages exhibit anti-stickiness cost behaviour.

		differently in different stages of a firm's life cycle.	- This association is moderated by the level of capital expenditure, and research and development, which can influence the cost stickiness of acquiring firms across different stages of firm life cycle.

1.3 Contribution of this thesis

The three essays in this thesis contribute to the literature in several ways. The first essay (in Chapter 2) provides a comprehensive analysis on the relationship between M&A deals and corporate tax avoidance by investigating the company effective tax rates for the years around the M&A announcement year. The findings of this study demonstrate that firms that engaged in tax avoidance in the current year and one year after M&A deals engage in tax avoidance (though not in the year before or two years after M&As). In addition, this study demonstrates that legislation could potentially prevent firms from engaging in tax avoidance. Findings suggest that acquiring firms engaged in less tax avoidance after the implementation of the IRS Repurchase Legislation (IRS 2007–48). Furthermore, the findings of this study provide analysis of the relationship between corporate tax avoidance and M&As by investigating different channels potentially affecting that relationship. Gul et al. (2018) find that CEO equity compensation, CEO overconfidence, and audit quality affect the relationship between M&A activities and corporate tax avoidance. This study extends the work of Gul et al. (2018) by examining the impact of agency costs, managerial diversion and audit pricing on the positive relationship between M&As and corporate tax avoidance. There are six proxies for agency costs, two proxies for managerial diversion, and three measures of audit pricing in this essay. Findings suggest that the relationship between corporate tax avoidance and M&A activity is stronger in firms with higher agency costs, higher managerial diversion and higher audit pricing. Moreover, this study contributes to the literature on corporate tax avoidance as well as that on M&As. This study responds to the call from Hanlon and Heitzman (2010) for more research about the effects of tax avoidance among firms that have engaged in M&A activities. This study uses different theories to explain the behaviour of managers in making M&A decisions (managerial power theory vs incentive alignment theory), and in undertaking aggressive tax-avoidance measures (agency theory vs the

neoclassical view of tax management). Finally, the findings of this study will be of value to regulators and tax authorities.

The second essay in Chapter 3 contributes to the literature in several important ways. Prior research (Firth 2002, Fields et al. 2004) shows that audit efforts are likely to increase following M&As. However, this research did not investigate the channels through which this association could potentially operate. This study extends and contributes significantly to prior research in this area in a number of ways. First, this study examines audit pricing in firms that engaged in acquisitions both pre- and post-takeover announcements. It finds that acquiring firms experience higher audit fees in the year of acquisition and one year subsequent to the occurrence of a M&A deal, but not in the year immediately prior to a takeover announcement. These results demonstrate that the occurrence of M&A deals is likely to lead to higher audit fees. Second, this study investigates how financial restatements could potentially affect audit fees charged in acquiring firms. The results show that firms with financial restatements that engaged in M&A activity, incur significantly higher audit fees. Primarily, this relationship is driven by the occurrence of restatements related to accounting rule application failures, restatements related to an adverse effect on the financial statement (financial statement materiality) or restatements related to errors in accounting and clerical applications. This study responds to the call from (Hay et al. 2006, DeFond and Zhang 2014, Habib et al. 2020) to further examine the impact of audit fees in firms engaging in M&A deals, given that these deals are likely to have flow-on consequences on governance, internal control, transparency and business risk (Gaver and Paterson 2007). Third, the essay extends the work of Habib et al. (2020) by examining the channels that could potentially affect the relationship between audit fees, M&A deals and financial restatements. These channels include: strength of internal control material weaknesses (ICMW), level of audit quality (Big4 or non-Big4), geographical location of audit offices, and agency costs. The audit fees in acquiring firms with financial restatements are higher in the firms with internal control material weaknesses, in firms that employ non-Big4 auditors, in firms located in a city (state) different from that of their auditors and in firms with higher agency costs. Finally, the findings of this study will be of importance to a range of stakeholders. Given that M&As involve revaluation of assets and liabilities, valuation of new assets, and efficiency and risk assessments relating to the integration of business units, the findings will be of interest to investors, analysts, financial controllers and regulators. In particular, analysts will be interested in the likelihood of successful integration and continuity of business functions post-acquisition. Inefficiencies in the achievement of operational synergies, and increased complexity and uncertainty associated with integration are likely to reflect increased operational risks and, consequently, higher audit fees. This may be reflected additionally in the increased occurrence of financial restatements and the requirement to restate material deficiencies. Further, the mapping of the audit pricing-M&A relationship before, during and after an

M&A occurrence will be of interest to auditors, as they act as information repositories for their clients and, hence, the continuity and interpretation of that information will be of importance to them, as firms transition through M&A deals.

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 the first to show that firms engaging in M&A activities have lower levels of cost stickiness behaviour than firms not engaging in M&As. This study answers the call from Anderson et al. (2016) to investigate cost behaviour under different circumstances, such as those pertaining to M&A activities. Previous literature shows that the asymmetric cost behaviour varies in firms with different business strategies (Ballas et al. 2020). This study adds to the literature by documenting that this behaviour is also different in firms participating in M&A activities compared to those not participating. Second, the study investigates the cost stickiness behaviour of acquiring firms over their life cycle stages, based on the models of Dickinson (2011) and DeAngelo et al. (2006). The study demonstrates that acquiring firms in the introduction and decline stages exhibit higher levels of cost stickiness behaviour, but they have anti-stickiness cost behaviour in the growth, mature and decline stages. In doing so, this study answers the call from Habib and Hasan (2019) by investigating how the cost stickiness of acquirers changes across life cycle development. Third, the findings of this study contribute to the literature on firm cost behaviour, M&As, and corporate life cycle development, by investigating two channels that can potentially affect acquiring firms' cost stickiness behaviour across different stages of the firm life cycle. High and low capital expenditures, and high and low R&D expenses are investigated as potential channels affecting this relationship. In doing so, the results in this study provide a more nuanced examination of the mechanisms that could increase the level of cost stickiness in firms engaging in M&A activities across firm life cycle stages.

1.4 Structure of the thesis

This thesis is organised into five chapters and contains three essays. Chapter 1 outlines the background and motivation for the study, presents a summary of the findings and the contribution of the three essays, and ends with the organisation of chapters. Chapter 2 presents the first essay entitled "Acquisition activity and corporate tax avoidance". Chapter 3 presents the second essay entitled "The influence of restatements on audit pricing for firms engaging in M&A activities". Chapter 4 presents the third essay entitled "The influence of firm life cycle on the asymmetric cost behaviour of U.S. acquiring firms". Chapter 5 concludes the thesis, presenting the results of the research, the policy implications and directions for future research.

Chapter Two

2

Acquisition activity and corporate tax avoidance

2.1 Introduction

Mergers and acquisitions (M&As) are important in the U.S. corporate landscape with an increase in the number of deals, both in volume and value, over the past two decades. For example, there were 14,143 M&A deals announced for the 12-month period ending 30 June 2019, with an aggregate transaction value of approximately US$2.03 trillion[10]. Each year, the U.S. market incurs losses in tax revenue of nearly $240 billion from companies engaged in tax-avoidance practices[11]. There are around 24 countries spending US$53 billion annually on addressing avoidance of corporate tax[12].

Recent research has delineated multiple factors that contribute to corporate tax avoidance (Hanlon and Heitzman 2010). However, Hanlon and Heitzman (2010) suggest that further work is required to better establish possible links between corporate tax avoidance and corporate restructuring incentives and outcomes. This study contributes to and extends previous tax-based research by answering the call of Hanlon and Heitzman (2010) by exploring the relationship between M&A deals and corporate tax avoidance. Existing research does not clearly indicate whether M&A deals assist firms in facilitating tax planning and tax outcomes (Hanlon et al. 2015, Martin et al. 2015, Harris and O'Brien 2018). Tax-avoidance strategies could be part of the matters carried out in preparation for an M&A transaction. Companies have different goals because they are centred on increasing their business or maintaining their market supremacy, which is primarily focused on increasing profits (Jensen and Meckling 1976, Hope and Thomas 2008). The role of income taxation in the operation of companies undertaking M&A activities has been largely overlooked. A number of ownership benefits can be seen, such as a reduction of the tax burden on target companies (Belz et al. 2013). Acquiring firms may seek to minimise taxes more effectively by taking over another company and gaining higher after-tax cash flow (Belz et al. 2013). Holcomb et al. (2020) show that M&A activities increase when the investment income tax rate is lower. They find that private equity companies had a greater motivation in M&A activities seeking capital gains tax reductions in order to draw on the tax advantage associated with lower capital gains taxes.

This study investigates the level of corporate tax avoidance by U.S. firms participating in M&As over the period of 1990–2019. Findings indicate that acquiring firms experience a higher level of corporate tax avoidance in the current and one year following M&A deals. This results are robust to a number of tax-avoidance measures. Endogeneity analyses such as propensity score matching

[10] Factset. "US M&A News and Trends." Retrieved 26 May 2020, from https://www.factset.com/hubfs/mergerstat_em/monthly/US-Flashwire-Monthly.pdf

[11] OECD "International collaboration to end tax avoidance." Retrieved 26 May 2020 , from https://www.oecd.org/tax/beps/

[12] Industry Week "G20 Set for 'Very Aggressive' Crackdown on Tax Avoidance" Retrieved 26 May 2020 , from https://www.industryweek.com/finance/article/21964062/g20-set-for-very-aggressive-crackdown-on-tax-avoidance

(PSM) and Heckman's selection bias further confirm the results and mitigate any potential endogeneity issues resulting from the effect of omitted variables, reverse causality or model misspecification. In addition, difference-in-difference (DID) analysis on the effectiveness of adopting the IRS Repurchase Legislation indicates that acquiring firms were less engaged in tax avoidance after adopting the IRS 2007–48 rule. Moreover, the positive relationship between corporate tax avoidance and M&A activity is significantly more pronounced in firms with higher agency costs, higher managerial diversion and higher audit pricing.

This study contributes to the literature in several ways. First, it provides a comprehensive analysis on the relationship between M&A deals and corporate tax avoidance by investigating the company effective tax rates in the years around the M&A announcement year. Findings reveal that firms engage in tax avoidance in the current year and one year after M&A deals but not in the year before M&As or two years after M&As. This indicates that M&A deals are an important strategy potentially leading to tax avoidance. Second, this study demonstrates that legislation could potentially prevent firms engaging in tax avoidance. This study shows that acquiring firms were less engaged in tax avoidance after the implementation of the IRS Repurchase Legislation (IRS 2007–48). Third, it provides a comprehensive analysis of the relationship between corporate tax avoidance and M&As by investigating different channels potentially affecting that relationship. Gul et al. (2018) find that CEO equity compensation, CEO overconfidence, and audit quality affect the relationship between M&A activity and corporate tax avoidance. This study extends the work of Gul et al. (2018) by examining the impact of agency costs, managerial diversion and audit pricing on the positive relationship between M&As and corporate tax avoidance. I employ six proxies for agency costs, two proxies for managerial diversion, and three measures of audit pricing. Findings indicate that the relationship between corporate tax avoidance and M&A activity is stronger in firms with higher agency costs, higher managerial diversion and higher audit pricing. Fourth, this study contributes to the literature on corporate tax avoidance as well as that on M&As. It responds to the call from Hanlon and Heitzman (2010) for more research about the effects of tax avoidance among firms that have engaged in M&A activities. This study uses different theories to explain the behaviour of managers in making M&A decisions (managerial power theory vs incentive alignment theory), and in undertaking aggressive tax-avoidance measures (agency theory vs the neoclassical view of tax management). Finally, the findings of the study will be of value to regulators and tax authorities.

The remainder of this chapter is structured as follows. Section 2.2 reviews the literature and posits hypotheses for this study. The sample selection, regression model and variables are discussed in Section 2.3. The empirical results and robustness tests are presented and discussed in Section 2.4. Finally, Section 2.5 provides some concluding remarks to the study.

2.2 Literature Review and Hypotheses Development

2.2.1 M&As and corporate tax avoidance

The incentive alignment theory establishes that managers make M&A decisions to ultimately generate value for the firm (Bradley et al. 1988, Holthausen 1990, Seth 1990). An alignment between the incentives of managers and shareholders can be achieved through M&As by increasing the scale of production, lowering operating costs and improving managerial efficiency (Bradley et al. 1988). Managers who are active in M&As tend to optimise the benefit of merging companies and their potential synergies (Bradley et al. 1988, Seth 1990). On other hand, managerial power theory argues that managers in bidding companies choose to participate in M&A activities for "empire building" to obtain an advantage for themselves, or because they are affected by hubris or herd behaviour (Jensen and Meckling 1976, Jensen 1986, Scharfstein and Stein 1990, Hayward and Hambrick 1997, Hope and Thomas 2008). From this perspective, managers of acquiring firms can act in ways that maximise benefit to themselves, but such actions may not be in the best interests of shareholders and may subsequently lead to value-destroying acquisitions (Jensen 1986, Stulz 1990, Masulis et al. 2007, Hope and Thomas 2008, Chintrakarn et al. 2018).

Earlier studies show that agency problems can potentially be an incentive for firms to engage in corporate tax avoidance, since executives are likely to overinvest for personal gain (Chen and Chu 2005, Crocker and Slemrod 2005, Desai and Dharmapala 2006). Leepsa and Mishra (2016) contend that agency conflicts between managers and shareholders could generate other risks for firms, such as tracking operations performed by managers, and the risks in structuring compensation contracts. Kim et al. (2011) indicate that the agency's viewpoint is useful for evaluating tax-avoidance threats, and a company is disciplined for engaging in tax avoidance activities. In contrast, the classical view of tax management argues that any actions that can reduce the firm's tax expenses can potentially increase firm value (Sims and Sunley 1992). Consequently, cash savings generated from tax avoidance are expected to be efficiently invested in projects that can generate positive net present value. Desai and Dharmarpala (2009) find a positive relationship between corporate tax avoidance and firm value in firms with strong corporate governance structures.

Jensen and Ruback (1983) indicate that managers' decisions to engage in M&As could be motivated by financial reasons, such as the ability to make full use of tax shelters, to increase leverage, and to exploit other tax advantages (Devos et al. 2009). Kaplan (1989) documents that tax savings represent an important source of wealth gains in management buyouts of publicly listed companies. There are many economically important tax explanations for why a prospective acquiring firm would expect cash flows higher than those generated by the original firm (Belz et al. 2013). First, both domestic and foreign transactions give an acquiring firm the potential to lower the effective tax rate

(ETR) of a target firm through more efficient tax management of the target firm. Second, in the case of foreign acquisitions, an acquirer might be able to re-allocate income generated by a target firm that faces a comparatively high tax rate to another multinational group member where income is taxed at a lower rate (Belz et al. 2013). This is usually done by transfer pricing, income shifting, and use of tax havens, and may involve transfers of debt, equity, royalty, interest, and dividend and service payments. Taken together, high-acquisition firms appear more aggressive than low-acquisition firms in their tax strategies. Globally, tax avoidance has been used as a strategy for optimizing corporate relations and increasing the market share of a company. Recent empirical research indicates that tax avoidance is higher in firms with M&A activities (Gul et al. 2018). I developed the first hypothesis to express the potential relationship between companies actively seeking M&A deals and tax avoidance.

H1: Firms engaging in mergers and acquisitions (M&As) are more likely to engage in corporate tax avoidance.

2.2.2 The effect of agency costs on the relationship between M&As and tax avoidance

Recent studies on tax avoidance emphasise the significance of executive traits in assessing the degree of corporate tax planning (Desai and Dharmapala 2006, Wilson 2009, Rego and Wilson 2012). Corporate taxation is regarded as a critical element affecting cash flow and profits (Dyreng et al. 2008, Hanlon and Heitzman 2010, Kim and Li 2014). This relationship will likely give rise to increased agency costs and increased conflict of interests between managers and shareholders (Desai and Dharmapala 2006). Earlier literature has documented the relationship between tax avoidance and executive compensation. Powers et al. (2016) finds that various accounting metrics used to evaluate CEO short-term bonus incentives affect the level of corporate tax planning and financial reporting of income taxes. Gaertner (2014) confirms the negative relationship between effective tax rate (ETR) and CEO pay. Many studies find that the executives of acquiring firms receive significantly higher compensation following M&As, and that this larger post-acquisition remuneration is driven mainly by managerial power (Grinstein and Hribar 2004, Coakley and Iliopoulou 2006).

Bebchuk and Fried (2003) argue that there are two distinct approaches to executive compensation arrangements. Optimal contracting assumes compensation reflects an alignment of manager and shareholder interests, and the board of directors develops the best compensation contract for allowing management to optimise shareholder wealth. Alternatively, executive compensation can signal agency problems, as entrenched managers may have more power over their board, and consequently set their own compensation, to the detriment of shareholders (Jiraporn et al. 2005). This

management power has culminated in pay structures that decrease opportunities for executives to improve business performance, and can also generate incentives to minimise the long-term profitability of the firm (Bebchuk and Fried 2003). Jiraporn et al. (2005) document that CEOs receive more generous pay in firms in which shareholder interests are lower. Bebchuk and Fried (2003) show the possible harmful implications of using high-compensation opportunities. Wu (2011) suggests that the excess level of executive compensation could potentially be a sign of companies with agency problems. Graham et al. (2004) argue that CEO compensation tends to be a significant determinant of tax avoidance. They find that firms with higher executive compensation levels have lower tax shelter rates. Beatty (1995), Core and Guay (2001), and Graham et al. (2004) show how executive remuneration programs are influenced by the tax characteristics of a company.

Gul et al. (2018) find that CEO equity-based compensation negatively affects the relationship between M&As and corporate tax avoidance, as managers with high equity remuneration are less likely to engage in acquisitions that negatively affect shareholders' wealth. In this study, I investigate the impact of total CEO compensation, and further analyse how high versus low compensation can affect the positive relationship between tax avoidance and M&A activity. This study argues that firms with high CEO compensation are more likely to experience higher agency costs, as CEOs with bigger total compensation have more managerial power and are more likely to pursue empire building at the expense of shareholders. Consequently, I posit the following hypothesis:

H2: The positive relationship between M&A activity and corporate tax avoidance is increased in firms with higher agency costs.

2.2.3 The moderating effect of managerial diversion on the relationship between M&As and tax avoidance

Management team (e.g. CEOs, directors and executives) of the firm are responsible for making acquisitions, strategic decisions, funding, and other financial decisions (Dutta et al. 2013). When ownership and management are separated, it gives opportunities for managers to seek private benefits at the expense of shareholders (Li and Li 2018). Managerial opportunism can result in decisions that lead to value-destroying acquisitions (Black et al. 2014, Katz et al. 2015). Previous literature shows that corporate tax avoidance helps in redistributing wealth from government to shareholders (Slemrod 2004, Chen and Chu 2005, Crocker and Slemrod 2005). Investors want managers to optimise earnings, which involves reducing the company's income tax present value, because shareholders with diversified portfolios are risk neutral (Venter et al. 2017). Shareholders favour all legitimate tax-avoidance approaches, including more extreme methods, in order to reduce the current tax burden (Slemrod 2004, Chen and Chu 2005, Crocker and Slemrod 2005, Hanlon and Heitzman 2010).

Desai (2005), Desai and Dharmapala (2006), and Desai et al. (2007) put the theory of corporate tax avoidance into the framework of managerial diversion. In this approach, tax avoidance and managerial diversion of corporate resources are complementary, while corporate governance becomes "ineffective" (i.e. when the expense of diversion for the manager becomes low). According to the theory of corporate tax avoidance, self-dealing insiders exploit the ambiguity inherent in sophisticated tax planning on the basis that reducing taxes helps shareholders, as residual claimants, in shielding their diversion from corporate resources. Therefore, the complementarity between tax avoidance and the diversion of managers offers greater incentives for secrecy.

Earlier literature shows that lower profitability (Mironov 2013, Blaylock 2016) can be used as proxies for the administrative diversion of a firm's resources. It is found that managerial diversion is highly correlated with poor company performance (Mironov 2013, Blaylock 2016). From the perspective of managerial diversion, managers in firms with lower profitability performance will use the savings from tax avoidance to divert corporate resources through perquisite consumption, overinvestments in fixed assets, and excessive compensation (Harford 1999, Titman et al. 2003, Black et al. 2014). Mironov (2013) finds relatively low tax payments reflect low reported profitability. If M&As facilitate a complementarity between manager diversion and tax avoidance, I predict that the positive relationship between M&As and tax avoidance will be stronger in firms with low performance (i.e. firms with high managerial diversion). This study therefore posits the next hypothesis:

H3: The positive relationship between M&A activity and corporate tax avoidance is increased in firms with high levels of managerial diversion.

2.2.4 The effect of audit pricing on the relationship between M&As and corporate tax avoidance

Hay et al. (2006) argue that key determinants of audit fees include the scale of the business, the sophistication of the process, and the company's inherent risk. These factors are often greater in firms that are involved in M&As (Menon and Williams 2001). Chen et al. (2019) argue that, at the planning stage, the audit effort is more likely to be a function of the complexity of previous M&A activities prior to the audit. Higher audit fees often apply in organisations which are less operationally efficient and are more interested in acquisitive actions (Fields et al. 2004).

Corporate taxes can affect both elements of audit fees, that is, business complexity and business risk. Managers can manipulate the ambiguity of tax-cost estimates for flexibility, to predict tax accruals and to manage profits. The difficulty of estimating tax costs and the flexibility inherent in calculating tax accruals establish information asymmetry between administrators, owners and auditors (Dhaliwal et al. 2004) that subsequently increases the likelihood of earnings management

(Schipper 1989). In addition, implementing ambitious tax-avoidance planning through management theoretically raises certain components of audit risk (Graham et al. 2012). Audit risks and audit fees are increased in firms that actively engage in avoiding taxes (Donohoe and Knechel 2014).

Auditors may consider the tax responsibilities of a company in order to accurately determine unpaid taxes and associated contingencies. Auditing firms with aggressive tax planning involves extensive analysis, detailed audit protocols, documents, and consultations with tax professionals (Hanlon and Heitzman 2010). In addition to the extra effort, there is a significant probability of errors in auditing complex transactions with uncertain legal bases, which exposes auditors to future lawsuits, and administrative and reputational risks (Stice 1991, O'Keefe et al. 1994, Simunic and Stein 1996, Menon and Williams 2001, Lisowsky 2010). In particular, firms and third parties may demand reimbursement for tax-related errors in financial statements, and regulators may enforce fines for incorrectly registered tax-related transactions (Simunic and Stein 1996, Menon and Williams 2001). The auditors therefore have good reason to charge a premium when auditing firms which practice corporate tax aggressiveness (Donohoe and Knechel 2014). On the basis of the above discussion, I posit the following hypothesis:

H4: The positive relationship between M&A activity and corporate tax avoidance is increased in firms with higher audit pricing.

2.3 Research Design

2.3.1 Sample and data

The data for this study was gathered from various sources. Thomson Reuters SDC Platinum was used to source M&A transactions announced by the listed US companies during the 30-year period of January 1990 to December 2019. In this study, I only considered M&A deals which are subsequently completed. Following earlier literature (Bris 2005, King 2009, Shen et al. 2014) I exclude spinoffs, leveraged buyouts, self-tenants, exchange offers, recapitalisations, repurchases, remaining interest acquisitions, purchases of minority stocks, and privatisations. I began the sample with 73,332 announced acquisitions. I removed duplicate announcements made by a firm in a fiscal year (25,169 firm-year observations), and deleted firms in utility and financial industries with two-digit industry codes of 49 and 60–69 (24,987 firm-year observations). Utility companies were excluded because their capital structures are typically correlated with higher debt levels, thereby impacting the estimation of various forms of tax-avoidance proxies. Financial firms were excluded because of substantial variation in their use of accounting standards and accounting approximations regarding other firms, and the discrepancies in compliance constraints that they face. After consolidating with financial data from the Compustat database, the sample was further reduced by 6,896 firm-year observations. The final M&A sample consists of 16,280 firm-year observations.

The control sample started with all US companies in the Compustat database over the period of 1990–2019, a total of 325,865 firm-year observations. I removed firms in utility and financial industries with two-digit industry codes of 49 and 60–69 (104,230 firm-year observations). After 143,395 observations were eliminated due to the lack of financial data, the final sample consisted of 78,240 company-year observations. Data on auditing pricing was sourced from the Audit Analytics database. The selection of the control sample and the M&A sample are in Panel A of Table 2-1. Table 2-1 Panel B presents the sample distribution based on the 48-industry classification of Fama and French (1997). The majority of companies in the control sample are in business services (12.79%), electronic equipment (6.53%), retail (6.47%), and petroleum and natural gas (6.12%). For the M&A sample, most bidding firms are from the business services sector (17.79%), followed by wholesale (6.53%) and electronic equipment (5.82%).

Table 2-1 Sample selection and industry distribution

Panel A: Sample selection	
Original sample [from Compustat (1990–2019)]	325,865
Less financial and utility firms (SIC 60–69 and 49)	(104,230)
Less firms for which accounting data for the regression analysis is missing	(143,395)
Control sample total	**78,240**
M&A proposals announced [from SDC Platinum (1990–2019)]	73,332
Less merged multiple acquisitions announced, by firm and year	(25,169)
Less financial and utility firms (SIC 60–69 and 49)	(24,987)
Less firms with missing accounting data	(6,896)
M&A sample total	**16,280**

Panel B: Industry distribution					
Control sample	N	%	M&A sample	N	%
Business services	10,005	12.79	Business services	2,897	17.79
Electronic equipment	5,110	6.53	Wholesale	1,063	6.53
Retail	5,060	6.47	Electronic equipment	947	5.82
Petroleum and natural gas	4,788	6.12	Petroleum and natural gas	859	5.28
Wholesale	3,894	4.98	Retail	845	5.19
Transportation	3,113	3.98	Computers	762	4.68
Computers	2,919	3.73	Machinery	760	4.67
Measuring and control Equipment	1,884	2.41	Healthcare	718	4.41
Business supplies	1,305	1.67	Medical Equipment	528	3.24
Remaining industries	40,162	51.33	Remaining industries	6,901	42.39
Total	**78,240**	**100**	**Total**	**16,280**	**100**

2.3.2 Empirical model

To examine the relationship between M&A deals and tax avoidance (H1), I postulate a baseline ordinary least squares (OLS) regression model in the form of the following equation:

$$TAX\_AVOID_{i,t} = a_{0\,i,t} + \beta_1 M\&A\ deals_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 MTB_{i,t} + \beta_4 LEV_{i,t} + \beta_5 CASH_{i,t} + \beta_6 ROA_{i,t} + \beta_7 INTANG_{i,t} + \beta_8 CAPEX_{i,t} + \beta_9 FI_{i,t} + \beta_{10} ADV_{i,t} + \beta_{11} RD_{i,t} + \beta_{12} PPE_{i,t} + \beta_{13} NOL_{i,t} + \beta_{14} EBITDA_{i,t} + \beta_{15} \Delta SALES_{i,t} + IND\_FE + YEAR\_FE + \varepsilon_{i,t} \quad \text{(Equation 2.1)}$$

The dependent variable tax avoidance (*TAX_AVOID*) is measured as *CASH ETR*, *SHELTER* and *UTB*. The independent variable in this study is the occurrence of M&As (*M&A deals*). In all the regression analyses we control for the effects of both year (*YEAR_FE*), and industry (*IND_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.

To investigate the moderation impact on the association of tax avoidance and M&As (H2, H3 and H4), I partitioned the original M&A sample into 2 subsamples (high vs low) for each of the moderation variables and re-ran the Equation (2.1). All measures of agency costs, managerial diversion and audit pricing were separately divided into high or low subsamples if above or below the median of the sample.

2.3.2.1 Dependent Variables

Corporate tax avoidance is the dependent variable in this study and it is measured in a number of ways. Initially, I use *CASH ETR* – this refers to cash taxes paid divided by the pre-tax accounting income, minus special items (Dyreng et al. 2008) at the year of the merger announcement. Although the *CASH ETR* measure of corporate tax avoidance is not specifically designed to capture sheltering of taxes, to a certain degree it ideally reflects legitimate tax positions (Rego and Wilson 2012, Lisowsky et al. 2013).

Following Lisowsky et al. (2013), and Wilson (2009), I use *SHELTER* and unrecognised tax benefits (*UTB*s) as additional measures of aggressive corporate tax strategies. *SHELTER* is measured using the Wilson's Tax Shelter model to analyse how corporate characteristics are related to tax shelter behaviour (Wilson 2009). I perform a binary variable logistic regression (SHELTER=1, 0) against a list of independent variables: foreign pre-tax income, discretionary accruals, book-tax differences, leverage, gross assets, asset returns, and R&D. A company is deemed to have taken part in tax shelter actions if the prediction shelter odds in the top distribution quintile are identified. A higher SHELTER value indicates a greater chance of engaging in tax avoidance (Wilson 2009). *UTB* refers to an accounting reserve for contingent tax liabilities set up if a company is involved in tax-avoidance strategies that enable it to reduce its current tax payments (Rego and Wilson 2012), scaled by lagged total assets. Previous studies suggest that a higher *UTB* signals future tax avoidance (Hanlon and Heitzman 2010).

2.3.2.2 Independent variable

The independent variable in this study is *M&A deals*, a dummy variable set to 1 if the firm has made any M&A announcements during the year. I also examine how the relationship between M&A activity and corporate tax avoidance is moderated by agency costs, managerial diversion and audit pricing. The main proxy[13] for agency costs is CEO compensation, for managerial diversion is firm performance, and for audit pricing is audit fees. Appendix 2.1 contains definitions of these variables.

2.3.2.3 Control variables

Following earlier literature (Frank et al. 2009, Wilson 2009, Hanlon and Heitzman 2010, Rego and Wilson 2012), I control for a number of variables that can impact corporate tax avoidance. They include firm size (*SIZE*), market-to-book value of equity (*MTB*), firm leverage (*LEV*), *CASH*, return on assets (*ROA*), intangible assets (*INTANG*), foreign income (*FI*), R&D expenses, carry forward losses (*NOL*), property, plant and equipment (*PPE*), capital expenditure *(CAPEX*), advertising expenses (*ADV*), earnings before interest, tax depreciation and amortisation (*EBITDA*), and changes in sales from the prior year (*Sale growth*). Appendix 2.1 contains definitions of these control variables.

2.4 Empirical Results and Discussion

2.4.1 Univariate analysis

The descriptive statistics for variables used in the analyses are reported in Table 2-2. They are generally similar to those reported in previous studies (e.g., Ayers et al. 2009, Wilson 2009, Dyreng et al. 2010, Rego and Wilson 2012, Gaertner 2014, Graham et al. 2014, Chow et al. 2015, Goh et al. 2016, Gul et al. 2018). The mean *CASH ETR* is 0.33 with an interquartile range from 0.40 to 0.33.

The average value of the *M&A deals* variable is approximately 0.21 in the sample, and is consistent with the figure in Gul et al. (2018). In terms of control variables, the average natural log of total assets for firms in the sample is 6.02; the mean value of market-to-book ratio is 2.85, and of ROA, 0.10. The sample firms, on average, have the leverage ratio of 0.22; cash and marketable securities, scaled by total assets, 0.16; intangible assets as a proportion of total assets, 0.14. The average value of the R&D intensity ratio is 0.03; of sales growth, 0.22; of property, plant and equipment as a percentage of sales, 0.48. The proportion of firms in the sample that have net operating losses is, on average, 0.38; capital expenditure as a proportion of property, plant and equipment, 0.14;

[13] In the later section (Section 4.5), I also employ other measures of agency costs, of managerial diversion and of audit pricing to check for the robustness of the main results.

and advertising expenses as a percentage of sales, 0.01. The average proportion of earnings before interest, tax depreciation and amortisation, and of foreign income is 0.13 and 0.01, respectively. The statistics of the control variables are similar to those in earlier literature (Ayers et al. 2009, Wilson 2009, Dyreng et al. 2010, Gaertner 2014, Chow et al. 2015, Gul et al. 2018).

Table 2-2 Descriptive Statistics

Variable	N	Mean	S.D	min	p25	Median	p75	max
Cash ETR	78240	0.330	0.313	0.000	0.093	0.253	0.408	1.000
M&A deals	78240	0.208	0.406	0.000	0.000	0.000	0.000	1.000
Size	78240	6.022	2.271	-2.703	4.403	5.988	7.618	10.748
MTB	78240	2.851	5.481	-43.537	1.240	2.049	3.431	50.993
Leverage	78240	0.221	0.238	0.000	0.033	0.190	0.336	5.194
Cash	78240	0.158	0.180	0.000	0.027	0.089	0.226	0.971
ROA	78240	0.101	0.098	-11.930	0.044	0.082	0.137	0.417
Intangibles	78240	0.141	0.179	0.000	0.000	0.061	0.221	0.767
R&D	78240	0.034	0.081	0.000	0.000	0.000	0.033	1.331
Sales Growth	78240	0.225	0.675	-0.996	0.013	0.104	0.252	8.722
PPE	78240	0.485	1.004	0.000	0.088	0.187	0.423	18.185
NOL	78240	0.378	0.485	0.000	0.000	0.000	1.000	1.000
CAPEX	78240	0.139	0.122	0.000	0.063	0.102	0.172	0.945
ADV	78240	0.010	0.027	0.000	0.000	0.000	0.006	0.236
EBITDA	78240	0.129	0.174	-10.007	0.065	0.109	0.171	0.568
FI	78240	0.012	0.027	-0.100	0.000	0.000	0.009	0.115

Notes: This table reports descriptive statistics for all variables that are used in main analyses. All Variable definitions are presented in Appendix 2.1.

2.4.2 Correlation analysis

Table 3 reports the Pearson pairwise correlation results for the variables used in the analysis. The independent variable, *M&A deals,* is negatively correlated with *CASH ETR* (at $p<0.01$), suggesting that firms with M&A transactions have higher levels of tax avoidance.

Table 2-3 Pearson Correlation

	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	CASH ETR	1.000															
2	M&A deals	-0.065*	1.000														
3	Size	0.016*	0.129*	1.000													
4	MTB	-0.017*	0.029*	0.028*	1.000												
5	LEV	-0.002	0.038*	0.154*	-0.073*	1.000											
6	Cash	-0.039*	-0.087*	-0.231*	0.109*	-0.351*	1.000										
7	ROA	-0.027*	-0.024*	-0.084*	0.139*	-0.138*	0.204*	1.000									
8	Intangibles	-0.066*	0.258*	0.274*	0.012*	0.150*	-0.217*	-0.100*	1.000								
9	R&D	-0.037*	-0.011*	-0.175*	0.124*	-0.157*	0.419*	0.090*	-0.080*	1.000							
10	Sales growth	0.000	0.038*	-0.116*	0.075*	-0.030*	0.099*	0.060*	-0.020*	0.148*	1.000						
11	PPE	0.049*	-0.061*	0.116*	-0.042*	0.130*	-0.150*	-0.101*	-0.178*	-0.133*	0.078*	1.000					
12	NOL	-0.103*	0.017*	0.109*	0.008	0.044*	0.039*	-0.101*	0.174*	0.072*	-0.004	-0.026*	1.000				
13	CAPEX	-0.002	0.036*	-0.137*	0.102*	-0.123*	0.203*	0.129*	-0.069*	0.157*	0.261*	0.034*	-0.062*	1.000			
14	ADV	-0.019*	-0.013*	0.038*	0.062*	-0.008	0.070*	0.055*	0.073*	0.009*	-0.023*	-0.085*	0.012*	0.051*	1.000		
15	EBITDA	-0.038*	0.043*	-0.004	0.133*	-0.193*	0.076*	0.319*	-0.021*	0.017*	0.143*	-0.106*	-0.079*	0.172*	0.027*	1.000	
16	FI	-0.077*	0.053*	0.230*	0.059*	-0.051*	0.058*	0.114*	0.079*	0.063*	-0.044*	-0.076*	0.127*	-0.038*	0.055*	0.073*	1.000

Notes: This table reports the pairwise Pearson correlations between the variables used in the main analysis. *denotes $p \leq 0.01$. See Appendix 2.1 for variable definitions.

2.4.3 M&As and corporate tax avoidance

This study evaluate Equation (2.1) to test Hypothesis 1, that firms engaging in mergers and acquisitions (M&As) are more likely to engage in corporate tax avoidance. In Column (1) of Table 2-4, I use *CASH ETR* as a proxy for tax avoidance and find that the coefficient of the *M&A deals* variable is significantly negative (at $p<0.01$). From an economic perspective, a one standard deviation change in M&A deals (0.406), gives rise to a reduction in cash ETR by -1.91%[14]. This evidence supports the first hypothesis that firms undertaking M&As are more likely to engage in corporate tax avoidance (H1).

The estimated coefficients of control variables are generally consistent with those in the literature (e.g. Ayers et al. 2009, Wilson 2009, Dyreng et al. 2010, Rego and Wilson 2012, Gaertner 2014, Chow et al. 2015, Goh et al. 2016, Gul et al. 2018). For example, I find that larger firms with higher leverage, higher net operating losses, higher foreign income, higher advertising costs, and higher earnings before interest, tax depreciation and amortisation have higher levels of tax avoidance (at $p \leq 0.10$).

2.4.4 Robustness tests

2.4.4.1 Alternative proxies of tax avoidance: robustness checks

In the previous section, *CASH ETR*, which is in the lower end of the continuum of tax-planning strategies, was used to conduct the analyses. Here I re-estimate the first regression analysis using two more aggressive tax-avoidance measures, *SHELTER* and *UTB*, and record the results in Columns (2) and (3) of Table 2-4. When using *SHELTER* and *UTB*, the coefficients of *M&A deals* are significantly positive (at $p<0.01$). From an economic perspective, a one standard deviation change in M&A deals (0.406), gives rise to an increase in tax shelter and unrecognised tax benefits by 2.43% and 0.04% respectively[15]. These findings are consistent with the previous results of *CASH ETR* – that firms that have participated in M&As have higher tax avoidance – and show that the decision to engage in M&As is another driver of a company's risky tax strategies.

[14] I calculated the economic magnitude for the effects of M&A deals on tax avoidance which measured by CASH ETR as (0.406*-0.047) = -0.0191.

[15] I calculated the economic magnitude for tax shelter as (0.406*0.060) = 0.0243; and for unrecognized tax benefits, as (0.406*0.001) = 0.0004.

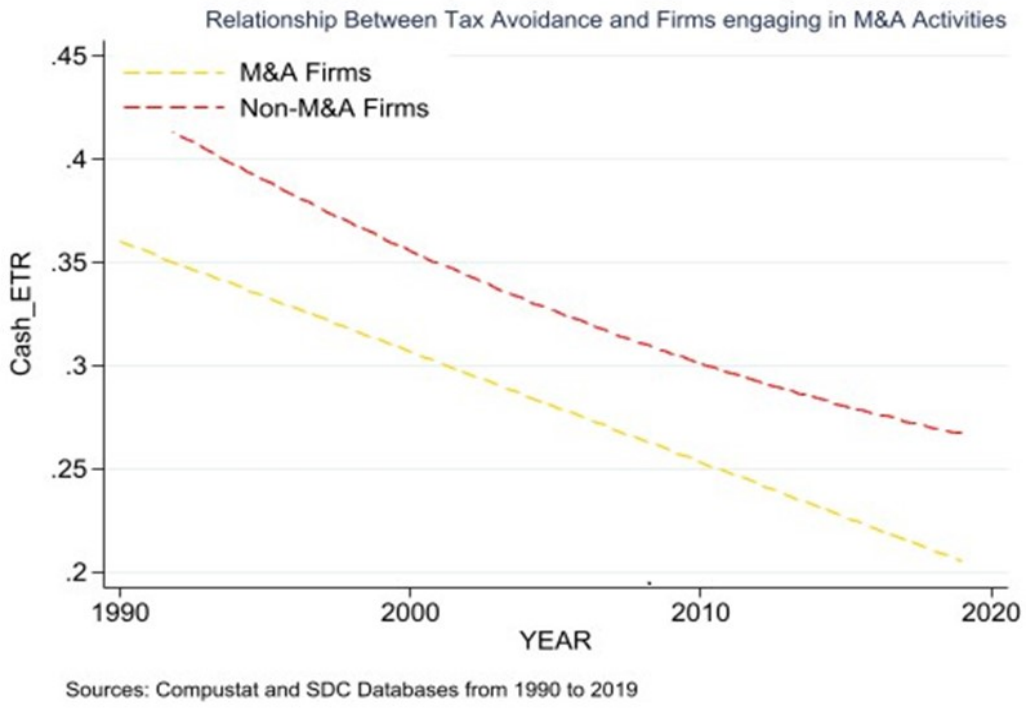
Table 2-4 M&A activities and tax avoidance - Using OLS Regression

	(1)	(2)	(3)
	CASH ETR	**SHELTER**	**UTB**
M&A deals	**-0.047*** **	**0.060*** **	**0.001*** **
	(-13.384)	**(11.874)**	**(7.245)**
Size	0.011***	0.053***	0.000***
	(7.861)	(24.966)	(10.808)
MTB	-0.000	0.001***	-0.000
	(-0.693)	(3.003)	(-0.836)
Leverage	-0.038***	0.035***	0.001**
	(-4.180)	(3.058)	(2.383)
Cash	0.012	0.098***	0.003***
	(0.935)	(5.930)	(8.975)
ROA	-0.040*	0.398***	-0.000
	(-1.749)	(3.909)	(-0.785)
Intangibles	-0.022*	0.002	0.002***
	(-1.659)	(0.099)	(4.994)
R&D	-0.023	0.374***	0.006***
	(-0.780)	(12.624)	(7.551)
Sales growth	0.003	0.016***	-0.000***
	(1.208)	(6.890)	(-2.624)
PPE	0.003	0.000	-0.000***
	(1.052)	(0.039)	(-6.487)
NOL	-0.036***	0.036***	0.001***
	(-8.478)	(6.176)	(7.268)
CAPEX	-0.020	0.021	-0.002***
	(-1.317)	(1.316)	(-5.926)
ADV	-0.223***	0.041	0.006**
	(-3.446)	(0.399)	(2.345)
EBITDA	-0.077***	0.026	0.000
	(-4.687)	(1.215)	(0.373)
FI	-0.646***	1.045***	0.044***
	(-9.330)	(7.636)	(15.480)
Constant	0.392***	-0.473***	-0.004***
	(9.704)	(-16.627)	(-9.160)
Obs.	78,240	76,663	78,240
Adj. R-squared	0.054	0.248	0.265
Industry Dummy	YES	YES	YES
Year Dummy	YES	YES	YES

Notes: This table presents the regression results between corporate tax avoidance and M&A activity. Variables are defined in Appendix 2.1. Robust *t*-statistics are in brackets. *, **, and *** denote two-tailed significance at $p<0.1$, 0.05 and 0.01, respectively.

Figure 2-1 visually shows the relationship between corporate tax avoidance (proxy as *CASH ETR*) and M&A firms (or non-M&A firms). It is clear that *CASH ETR* of firms engaging in M&A activities is less than that of firms not involving in M&A transactions, signifying that firms undertaking M&As are more likely to have higher corporate tax avoidance (H1).

Figure 2-1 Corporate tax avoidance – M&A firms vs non-M&A firms



2.4.4.2 Time series of tax avoidance

I further investigate the time effect of corporate tax avoidance in one year before, one year and two years after the merger announcement year. The regression model (2.1) is re-estimated with dependent variables being $CASH\ ETR_{t-1}$, $CASH\ ETR_{t+1}$ and $CASH\ ETR_{t+2}$. The regression results are presented in Columns (1)-(3) of Table 2-5. It is found that the *M&A deals* variable is only negatively significant for $CASH\ ETR_{t+1}$ (at $p<0.01$), but insignificant for $CASH\ ETR_{t-1}$ and $CASH\ ETR_{t+2}$. This provides evidence that acquiring firms significantly engage in corporate tax avoidance only in the year following M&A transactions, but not the year prior to or two years after M&A announcement year.

Table 2-5 M&A activities and tax avoidance – Cash ETR over time changed

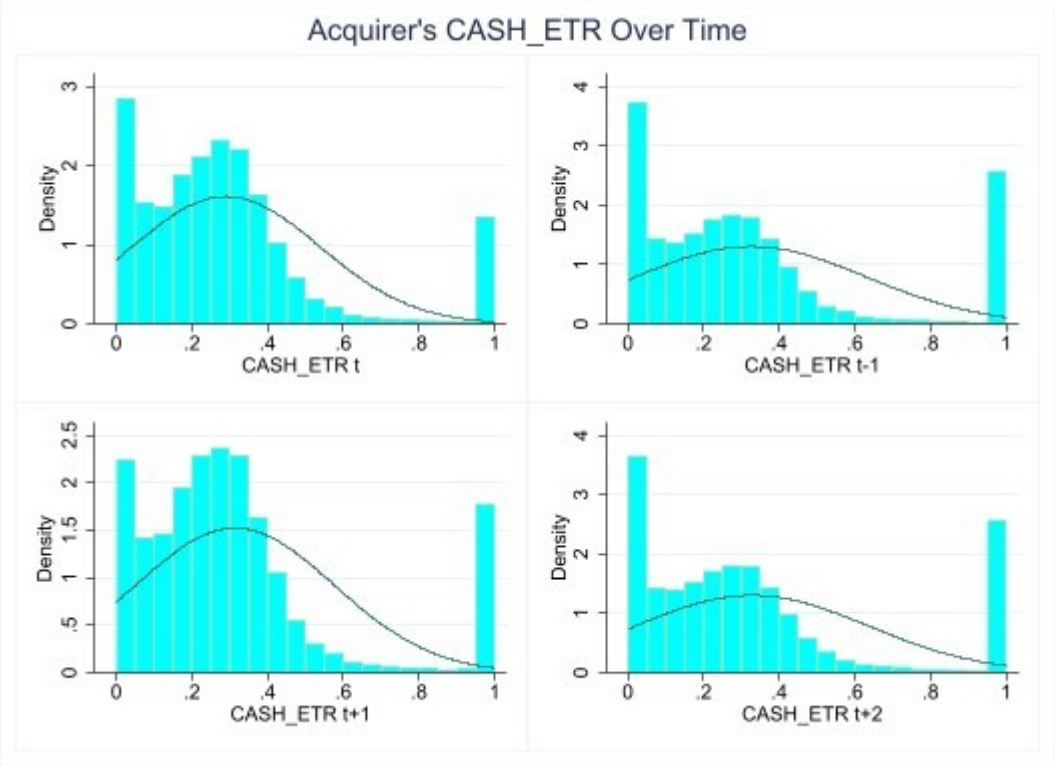
	(1)	(2)	(3)
	CASH ETR$_{t-1}$	**CASH ETR$_{t+1}$**	**CASH ETR$_{t+2}$**
M&A deals	**-0.002**	**-0.047*****	**0.002**
	(-0.740)	**(-12.712)**	**(0.637)**
Size	0.004***	0.010***	0.004***
	(5.422)	(6.410)	(5.084)
MTB	0.000	-0.001***	0.000
	(0.528)	(-3.160)	(0.501)
Leverage	-0.008	-0.035***	-0.004
	(-1.477)	(-3.553)	(-0.816)
Cash	0.007	0.015	-0.021**
	(0.779)	(1.082)	(-2.409)
ROA	-0.004	0.159***	0.010
	(-0.319)	(5.716)	(0.764)
Intangibles	-0.007	-0.018	-0.018**
	(-0.825)	(-1.307)	(-2.154)
R&D	-0.051***	-0.138***	-0.036**
	(-3.047)	(-3.937)	(-2.069)
Sales growth	-0.001	0.008***	0.001
	(-0.338)	(2.802)	(0.478)
PPE	0.002	-0.000	0.000
	(0.761)	(-0.107)	(0.005)
NOL	-0.005**	-0.028***	-0.007***
	(-1.976)	(-6.513)	(-2.668)
CAPEX	-0.010	-0.047***	-0.014
	(-0.939)	(-2.851)	(-1.311)
ADV	-0.090**	-0.246***	0.004
	(-2.049)	(-3.589)	(0.096)
EBITDA	-0.000	-0.068***	0.004
	(-0.055)	(-3.321)	(0.521)
FI	-0.150***	-0.514***	-0.112**
	(-3.214)	(-7.069)	(-2.367)
Constant	0.364***	0.403***	0.384***
	(18.355)	(10.931)	(18.627)
Observations	78239	64449	78238
Adj. R-squared	0.038	0.067	0.037
Industry Dummy	YES	YES	YES
Year Dummy	YES	YES	YES

Notes: This table presents the regression results between corporate tax avoidance (at *t-1*, *t+1* and *t+2*) and M&A activity. Variables are defined in Appendix 2.1. Robust *t*-statistics are in brackets. *, **, and *** denote two-tailed significance at $p<0.1$, 0.05 and 0.01, respectively.

Figure 2-2 visually demonstrates how corporate tax avoidance (*CASH ETR*) is different for acquiring firms in the year of merger (t), one year before (t-1), one year after (t+1) and two years following merger announcement (t+2). The histograms show the normal density to the graphs of *CASH ETR$_{t-1}$*, *CASH ETR$_t$*, *CASH ETR$_{t+1}$*, and *CASH ETR$_{t+2}$* for firms engaging in M&A activities are differentiated with the peak of normal density for the histograms of *CASH ETR$_t$* and *CASH ETR$_{t+1}$*.

The visual evidence supports the argument of the effect of time changes of *CASH ETR* on firms engaging in M&A operations.

Figure 2-2 Histograms - corporate tax avoidance around M&A announcement year (t)



2.4.4.3 Propensity score matching (PSM) results

In this section, I use propensity score matching (PSM) analysis to address the issue of potential endogeneity (Shipman et al. 2017) as the baseline regression results might be driven by the systematic differences between M&A and non-M&A firms. I estimate propensity scores by applying a probit regression to predict the probability of making M&A transactions. I use sample firms with M&A deals and their propensity-score-matched control firms with non-M&A deals. To obtain the control sample in each year over the sample period, I run a probit regression where the dependent variable is an indicator. I select firms that have the nearest propensity of having M&A transactions based on a caliper of 1%. The sample of PSM firms is then used to re-estimate Equation (2.1) with *CASH ETR* as the proxy for tax avoidance. The PSM results, presented in Column (1) of Table 2-6, show that the estimated coefficient of the M&A deals variable is significantly negative (at $p<0.01$). These results provide support for the main finding that firms participating in M&A transactions have higher corporate tax avoidance.

2.4.4.4 Heckman test

In this section, the Heckman analysis is applied to control for self-selection bias (Heckman 1979). In the first stage, I use the probability of making acquisitions as an instrumental variable and estimate the probit regression of firms making acquisitions (in dummy format) on all of the control variables used in the main equation. In the second stage, I calculate an inverse Mills ratio, based on the estimated coefficients from the first stage, and include it as an independent variable in the regression analysis. The inverse Mills ratio controls for the effect of the observable determinants of a firm's decision about making acquisitions on the relationship between the probability of making acquisitions and different dimensions of corporate tax avoidance. The results of the first and second stage are presented in Columns (2) and (3) of Table 2-6, respectively. Findings indicate that the coefficient of the *M&A deals* variable is still significantly negative (at $p<0.01$) when the inverse Mills ratio is included in the regression (Column (3) of Table 2-6). This indicates that my results are robust when controlling for the Heckman self-selection bias.

Table 2-6 M&A activities and tax avoidance – Endogeneity tests

	Dependent variable: CASH ETR		
	(1)	(2)	(3)
	PSM	Heckman	
		First stage	Second stage
M&A deals	**-0.049*** **		**-0.048*** **
	(-12.105)		**(-13.450)**
Mills-ratio			0.103
			(1.395)
Size	0.011***	0.012**	0.020***
	(6.678)	(2.032)	(3.122)
MTB	-0.000	0.001***	0.000
	(-0.517)	(2.654)	(0.266)
Leverage	-0.064***	-0.080***	-0.044***
	(-4.810)	(-6.129)	(-4.354)
Cash	-0.016	-0.116***	-0.021
	(-0.929)	(-4.175)	(-0.793)
ROA	0.120***	0.098*	-0.078*
	(2.951)	(1.893)	(-1.751)
Intangibles	-0.002	0.297***	0.118
	(-0.104)	(3.086)	(1.183)
R&D	-0.114***	-0.176***	-0.023
	(-3.193)	(-4.715)	(-0.791)
Sales growth	0.008**	0.008*	0.007*
	(2.010)	(1.797)	(1.838)
PPE	-0.014**	-0.017***	0.001
	(-2.488)	(-4.251)	(0.386)
NOL	-0.041***	-0.035***	-0.034***
	(-8.376)	(-7.320)	(-8.052)
CAPEX	-0.002	0.060**	0.001
	(-0.080)	(2.342)	(0.064)
ADV	-0.235***	-0.117	-0.299***
	(-2.860)	(-1.189)	(-3.547)
EBITDA	-0.222***	-0.103*	0.010
	(-6.698)	(-1.698)	(0.164)
FI	-0.575***	0.062	-0.551***
	(-7.021)	(0.552)	(-5.513)
Constant	0.415***	0.060	0.168
	(10.128)	(0.375)	(1.023)
Observations	31,786	78,240	78,240
Adj. R-squared	0.071	0.1172	0.054
Industry Dummy	YES	YES	YES
Year Dummy	YES	YES	YES

Notes: This table reports the results of endogeneity tests (propensity score matching [PSM], and Heckman). Variables are defined in Appendix 2.1. Robust *t*-statistics are in brackets. *, **, and *** denote two-tailed significance at $p<0.1$, 0.05 and 0.01, respectively.

2.4.4.5 Additional test for the changes in tax rule (Difference-in-difference test)

In this section, I assess the change in relationship between tax avoidance and M&A activities when tax rules changed in 2007. Before 31st May 2007, the rules for tax-free reorganisation specifically allowed corporations to restructure and to use the stock of their parent company to obtain a target. For example, the US parent stock may be used to purchase a foreign subsidiary when an international holding company is formed or expanded (Yoder 2007). However, in reaction to IBM's use of a foreign subsidiary as part of its repurchase scheme, the IRS Repurchase Legislation (IRS 2007–48) was introduced on 31 May 2007 to the legislation enforced the use of foreign exchange holdings to buy shares in overseas companies. Initially, the subsidiary of IBM publicly repurchased shares and used the shares to pay its US parent for goods and services, resulting in IBM being able to bring profits into the USA without incurring a tax liability (the tax savings in this instance were nearly $1.6 billion)[16]. The IRS recognised the mechanisms of income-shifting in the scheme and issued Notice 2007–48 to prohibit such transactions from 31st May 2007. I, therefore, take advantage of the adoption of the IRS 2007–48 rule as an exogenous shock which has undoubtedly influenced marginal tax levels and tax-avoidance strategies (Cen et al. 2017). The adoption of the IRS 2007–48 rule that occurred in 2007 changes nixes between financial reporting and tax reporting, so there has been more disclosure for firms on their tax planning. In this regard, tax effects for M&A should potentially be coming out more, which might moderate the influence of the relationship between M&A activities and tax avoidance. To conduct the difference-in-difference (DID) analysis, I first split the sample into two sub-periods: 1990–2007 and 2008–2019. I then created an interaction term to capture the difference in tax avoidance between the treatment and non-treatment groups before and after 2007. The following regression model is estimated:

$$Cash\ ETR_t = \beta_0 + \beta_1 M\&A\ deals_t + \beta_2 TIME_t + \beta_3 M\&A\ deals_t * TIME_t + \beta_{3-14} CONTROLS_t + \beta_m IND\ DUMMIES + \varepsilon_{i,t} \quad \text{(Equation 2.2)}$$

The dummy variable *TIME* is coded 1 for observations in the 1990–2007 period, and 0 for the period of 2008–2019; *M&A deals* refers to the occurrence of M&As (a dummy variable if there is any acquisition announcement); *M&A deals*TIME* is an interaction term that captures the DID effect. The regression results for the above DID analysis are shown in Table 2-7. The estimated coefficient of the interaction term *M&A deals*TIME* is significantly negative (at $p<0.01$), implying that tax avoidance among M&A firms was significantly higher before the IRS repurchase regulation (IRS 2007–48) was implemented than it was after it.

[16] Hoehne, P. (2007) IRS expands killer B regulations. *Wood and Porter*, Available at: http://www.woodporter.com/Publications/Articles/ma/September2007p4.pdf.

Table 2-7 M&A activity and tax avoidance – Difference-in-Difference analysis (DID)

	(1)
Dependent variable	**CASH ETR$_t$**
TIME	0.064***
	(14.125)
M&A deals	-0.025***
	(-4.910)
TIME×M&A deals	**-0.026*** **
	(-4.437)
Size	0.008***
	(5.945)
MTB	-0.000
	(-1.175)
Leverage	-0.034***
	(-3.809)
Cash	-0.019
	(-1.516)
ROA	-0.054**
	(-2.141)
Intangibles	-0.061***
	(-4.664)
R&D	-0.015
	(-0.506)
Sales growth	0.003
	(0.991)
PPE	0.002
	(0.532)
NOL	-0.046***
	(-10.951)
CAPEX	0.011
	(0.720)
ADV	-0.206***
	(-3.193)
EBITDA	-0.069***
	(-4.316)
FI	-0.647***
	(-9.303)
Constant	0.275***
	(6.820)
Observations	78240
Adj. R-squared	0.043
Industry Dummy	YES

Notes: This table presents the regression results between corporate tax avoidance and M&A activity using Difference-in-Difference [DID] analysis. *TIME* is to capture the impact of the IRS Repurchase Legislation (IRS 2007-48 rule), an indicator variable equals to 1 for the period of 1990-2007, 0 otherwise. All other variables are defined in Appendix 2.1. Robust *t*-statistics are in brackets. *, **, and *** denote two-tailed significance at $p<0.1$, 0.05 and 0.01, respectively.

2.4.5 Cross-sectional analyses

I conducted cross-sectional analyses to examine channels that moderate the relationship between M&A deals and tax avoidance. The channels in this study are agency costs, managerial diversion and audit pricing.

2.4.5.1 Agency costs as a channel of M&As and tax avoidance

The results of the analysis of CEO compensation moderating the relationship between tax avoidance and M&A deals are reported in Columns (1) and (2) of Table 2-8. I split the sample into high and low CEO compensation subsamples based on above-median and below-median compensation. The coefficient of *M&A deals* is significantly negative for high CEO compensation (at $p<0.05$), but not significant for low CEO compensation. This indicates that firms paying high CEO compensation and undertaking M&A deals undertake more tax avoidance than firms with low CEO compensation. These results provide support for H2 that the positive relationship between M&A activity and corporate tax avoidance is increased in firms with high compensation (i.e. high agency costs).

2.4.5.2 Managerial diversion as a channel of M&A activities and tax avoidance

In this section, I focus on the leading year of tax avoidance (at time $t+1$) and current performance (at time t) to examine the moderating effect of firm performance on the relationship between tax avoidance and M&As. Performance is measured as income before extraordinary items, divided by total assets, minus the current year cash-effective tax rate. I split the original sample into two subsamples of firms with high and low performance, based on the median figure, and present the regression results in Columns (3) and (4) of Table 2-8. The estimated coefficient of *M&A deals* is significantly negative in the low-performance subsample ($p<0.01$), but is not significant in the high-performance subsample. This finding indicates that firms undertaking M&A deals which also have low performance (an indicator of high managerial diversion) have higher levels of tax avoidance in the year following M&As. The results provide evidence to support H3 that the positive relationship between M&A activity and corporate tax avoidance is increased in firms with low performance (i.e. high levels of managerial diversion).

2.4.5.3 Audit pricing as a channel of M&As and tax avoidance

To investigate the effect of audit fees on the relationship between tax avoidance and M&A activity, I employ audit fees as the main proxy for audit pricing. I divide the original sample into two subsamples: firms that have audit fees above (below) the sample median are classified into the high (low) audit fees subsample. The regression results are presented in Columns (5) and (6) of Table 2-8 with dependent variable being *CASH ETR*. The coefficient of *M&A deals* in the high audit fee subsample is negative and are statistically significant (at $p<0.01$) while it is positive and non-significant in the low audit fee subsample. This result confirms that firms undertaking M&A deals that also have high audit fees are more strongly related to higher tax avoidance.

Table 2-8 M&A activity and tax avoidance – Moderating effect of agency costs, managerial diversion and audit fees

	Dependent variable: CASH ETR					
	Agency costs		Managerial diversion		Audit pricing	
	(1)	(2)	(3)	(4)	(5)	(6)
	High compensation	Low compensation	High performance	Low performance	High audit fees	Low audit fees
M&A deals	**-0.008****	**0.001**	**0.001**	**-0.086*****	**–0.033*****	**0.001**
	(-2.047)	**(0.071)**	**(0.058)**	**(-20.019)**	**(-9.542)**	**(0.125)**
Constant	0.391***	0.515***	0.298***	0.502***	0.273***	0.276***
	(7.384)	(6.524)	(10.971)	(14.312)	(9.601)	(4.998)
Obs.	11,981	10,028	29,893	29,900	28,682	10,909
Adj. R-squared	0.089	0.071	0.098	0.097	0.041	0.041
Other controls	YES	YES	YES	YES	YES	YES
Industry Dummy	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES

Notes: This table reports the moderating effect of agency costs, managerial diversion and audit pricing on the relationship between tax avoidance and M&A deals. Proxies for agency costs, managerial diversion and audit price are CEO compensation, firm performance, and audit fees, respectively. They are divided into low or high subsamples when below or above the median figures. Variables are defined in Appendix 2.1. Robust t-statistics are in brackets. *, **, and *** denote two-tailed significance at p<0.1, 0.05 and 0.01, respectively.

2.4.5.4 Additional proxies for agency costs, managerial diversion and audit pricing

In this section, I employ a number of different measures of agent costs, managerial diversion and audit pricing to check for the robustness of the results presented in Table 2-8.

2.4.5.4.1 Other measures of agency costs

Following prior literature, we use other measures of agency costs such as sales-to-assets ratio, free cash flow (FCF), cash holdings, selling, general and administration (SG&A) expenses, and research and development (R&D) expenses. The sales-to-assets ratio has been used as a primary indicator of agency costs in the literature (Ang et al. 2000, Singh and Davidson 2003, McKnight and Weir 2009). This ratio tests the effectiveness of management using the company's assets to generate sales. The higher the ratio, the better the use of assets to produce revenue, implying reduced costs of agency. Conversely, a low ratio indicates that management enforces bad spending choices or unnecessary perquisites, suggesting high agency costs and poor use of assets (Singh and Davidson 2003, McKnight and Weir 2009). Earlier literature suggests that executives of firms with large FCF are more inclined to pursue low-profit or even value-destroying mergers (Jensen 1986, DeAngelo et al. 2006). Lang et al. (1991) and Harford (1999) indicate that surplus FCF generates management opportunities to engage in needless mergers, and deepens the agency problems within the firm. Masulis et al. (2007) argue that firms with higher FCF are more likely to experience higher agency costs and are more likely to make value-destroying acquisitions that are detrimental to shareholders' interests.

Agency theory contends that managers would rather keep cash to use for their own reasons (e.g. empire building) rather than return it to shareholders (Jensen 1986). It is shown that companies with high levels of cash have more agency problems (Dittmar et al. 2003), engage in value-destroying acquisitions (Harford 1999), and find that cash is worth less than its value (Pinkowitz et al. 2003, Faulkender and Wang 2006, Dittmar and Mahrt-Smith 2007).

SG&A expenses can make up a large part of the cost of business operations, with the average ratio of SG&A expenses to assets being 27% (Banker et al. 2011). Williamson (1963) uses SG&A costs as a proxy for the opportunistic actions of managers. Firms with high SG&A expenses could potentially have higher agency conflicts between managers and shareholders. In addition, agency theory argues that a higher than anticipated degree of investment in fixed assets and research and development (R&D) may reflect managerial opportunism (Jensen 1986, Hope and Thomas 2008, Blaylock 2016). Managers can extract rents through having asset-negative expenditures, such as acquisitions in R&D, that favour management but harm shareholders (Jensen 1986). Wu (2017) finds

that one of the important indicators of information asymmetry for a firm is that it has high R&D expenses.

I replicate the regressions in Columns (1) and (2) of Table 2-8 with the above-mentioned proxies for agency costs, and present the results in Panel A-1 of Table 2-9. For each measure of agency costs, I split the sample into the subsamples of low and high based on its median figure. It is found that the positive relationship between M&A activity and tax avoidance is stronger in firms with higher agency costs (i.e. firms with low sales-to-assets ratio, high FCF, high cash holding, high SG&A expenses, and high R&D expenses). Panel A-2 indicates that the average coefficient estimated for the *M&A deals* variable is smaller in the high-agency-cost subsample than that in the low-agency-cost subsample, suggesting acquiring firms with high agency cost engage more in corporate tax avoidance. This finding indicates that the main results in Columns (1) and (2) of Table 2-8 are robust across different measures of agency costs. It provides further support for the second hypothesis that the positive association of M&A activity and tax avoidance is magnified in firms with high agency costs.

I conduct additional tests of the mean differences in *CASH ETR* between the subsamples of high and low agency costs and report the results in Table 2-9 Panel A-2. It is observed that the mean difference in *CASH ETR* across the high and low agency proxy groups is significantly different from zero. For instance, the *t*-statistic for the mean difference between the subsample of low sales-to-assets ratio (i.e. high agency costs) and that of high sales-to-assets ratio (i.e. low agency costs) is 5.711 at $p<0.01$. The analyses in Panel A-2 indicate that firms with low sales-to-assets ratio (i.e. high agency costs) have significantly lower *CASH ETR* reflective of increased tax avoidance.

Furthermore, following Clogg et al. (1995), I employ a *z*-test to compare the difference in two estimated coefficients. The *z*-test is computed as:

$$Z = \frac{A\beta 1 - B\beta 2}{\sqrt{(SEA\beta 1)2 + (SEB\beta 2)2}}$$

The *z*-test values for testing the coefficient difference in sales-to-assets ratio, free cash flow, cash holding, SG&A, and R&D models are 9.94, 1.75, 5.93, 7.11, and 7.70, respectively (at *p*-values < 0.05). They indicated that there is a significant difference between the regression coefficients.

Table 2-9 M&A activity and tax avoidance – Additional proxies for agency costs

Panel A-1: Regression results										
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
	Dependent variable: CASH ETR$_t$									
	Low sales-to-assets	**High sales-to-assets**	**High Free Cash flow**	**Low Free cash flow**	**High cash holding**	**Low cash holding**	**High SG&A**	**Low SG&A**	**High R&D**	**Low R&D**
M&A deals	**-0.059*** **	**-0.033*** **	**-0.049*** **	**-0.038*** **	**-0.056*** **	**-0.039*** **	**-0.056*** **	**-0.038*** **	**-0.057*** **	**-0.030*** **
	(-15.716)	**(-9.474)**	**(-16.956)**	**(-7.194)**	**(-14.464)**	**(-11.471)**	**(-17.189)**	**(-9.002)**	**(-16.372)**	**(-5.809)**
Constant	0.381***	0.391***	0.357***	0.430***	0.407***	0.357***	0.396***	0.398***	0.389***	0.434***
	(11.136)	(15.535)	(15.071)	(10.418)	(13.945)	(11.949)	(14.551)	(12.021)	(15.314)	(8.347)
Obs.	32716	42190	52969	21902	37040	37902	43446	30863	42585	15997
Adj. R-squared	0.072	0.051	0.065	0.043	0.064	0.052	0.066	0.046	0.058	0.082
Other controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry Dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Panel A-2: Mean differences *t*-test										
Mean	0.278	0.301	0.278	0.316	0.285	0.293	0.287	0.293	0.286	0.294
Hypothesised mean differences	0		0		0		0		0	
Mean differences	0.022		0.038		0.008		0.006		0.007	
t-statistics for differences	5.771		9.202		2.075		1.664		1.98	
p-value	(0.000)		(0.000)		(0.019)		(0.048)		(0.023)	

Notes: Panel A-1 reports the additional analyses on the relationship between tax avoidance and M&A deals by using different proxies for agency costs. The additional proxies for agency costs include ratio of sales-to-assets, free cash flow, cash holding, SG&A expenses and R&D. They are divided into low or high subsamples if below or above the median. Panel A-2 reports *t*-tests for mean differences between the low and high sub-samples. Variables are defined in Appendix 2.1. Robust *t*-statistics are in brackets. *, **, and *** denote two-tailed significance at $p<0.1$, 0.05 and 0.01, respectively

2.4.5.4.2 Firm investment as the additional proxy for managerial diversion

Jensen (1986) and Hope and Thomas (2008) argue that executives are driven by their private desires for empire building, influence and prestige. A degree of investment in fixed assets higher than the anticipated level can suggest managerial opportunism (Hope and Thomas 2008, Blaylock 2016). Under the managerial diversion view, managers use tax savings to overinvest in projects to benefit themselves. M&As can encourage a complementarity between manager diversion and tax avoidance. I expect that the relationship between tax avoidance and M&A activity will be greater in firms with high levels of overinvestment. Following Atwood and Lewellen (2019), we initially estimated investments as a function of firm characteristics as below.

$$\begin{aligned} Investment_{i,t} = a_{0\,i,t} + \beta_1 Ln.assets_{i,t} + \beta_2 sales\_growth_{i,t} \\ + \beta_3 lev\_lag_{i,t} + \beta_4 cash\_lag_{i,t} + \beta_5 Age\_lag_{\,i,t} \\ + \beta_6 Invest\_lag_{\,i,t} + IND\_FE + YEAR\_FE + \varepsilon_{i,t} \end{aligned} \qquad \text{(Equation 2.3)}$$

The residuals of Equation (2.3) represent the amount of the firm's investment that its fundamentals cannot justify. Consistent with the findings of Atwood and Lewellen (2019), a firm with negative (positive) residual is classified as having underinvestment (overinvestment). I then examine the relationship between tax avoidance and M&A activity separately in the two subsamples of underinvestment and overinvestment, and present the regression results in Columns (1) and (2) of Table 2-10. The estimated coefficient of *M&A deals* is significantly negative (p<0.01) only in the overinvestment subsample. This finding suggests that firms undertaking M&A deals and that are prone to overinvestment (a signal of high managerial diversion) have higher corporate tax avoidance. The results strongly support hypothesis H3, that the positive relationship between M&A activity and corporate tax avoidance is increased in firms with high levels of overinvestment (i.e. high managerial diversion). This indicates that the main results in Columns (3) and (4) of Table 2-8 are robust to an alternative measures of managerial diversion.

2.4.5.4.3 Additional measures of audit pricing

In this section, I employ two alternative proxies for audit pricing: total audit fees (audit plus non-audit fees) and tax fees. It is documented in the literature that auditing firms providing tax services could potentially have a better knowledge of the functions of audit and tax, which may improve the quality of the services jointly provided. Kinney Jr et al. (2004) and Seetharaman et al. (2011) indicate that both accounting restatements and tax restatements are less likely to arise in companies with auditor-provided tax services (APTS). Fortin and Pittman (2008) demonstrate that bondholders charge lower yield spreads for businesses that use auditor-related tax services and pay

proportionately higher tax fees. Hanlon et al. (2012) document that firms with APTS report full reserves for the Internal Revenue Service (IRS), while firms without APTS need extra reserves in their tax expense evaluation. Cook et al. (2008) find that earnings management is most prevalent among firms that pay auditors comparatively higher tax fees, leading to decreases in the effective tax rate in the third or fourth quarter. The bundling of audit with tax services offers auditing firms the ability to reduce audit services when paying a tax service's premium, which is also viewed as a value-added initiative (McGuire et al. 2012, Donohoe and Knechel 2014). Tax-aggressive firms with APTS may charge a lower audit premium than tax-aggressive clients not purchasing APTS (Donohoe and Knechel 2014). In general, higher fees are frequently implemented in organisations that are less operationally effective and more involved in acquisitive behaviour (Fields et al. 2004).

For each additional measure of audit pricing, I divide the original sample into two subsamples: firms that have total audit fees (or tax fees) above (below) the sample median are classified into the high (low) subsample. The regression results are presented in Table 2-10 Columns (3) and (4) for the subsamples of total audit fees, and Columns (5) and (6) for the subsamples of tax fees). It is found that the coefficient of the *M&A deals* variable is significantly negative ($p<0.01$) in the subsamples of high total audit fees (and high tax fees), but not in the subsamples of low total audit fees (and low tax fees). It suggests that the main results in Columns (5) and (6) of Table 2-8 are robust to alterative measures of audit pricing.

Table 2-10 M&A activities and tax avoidance – Additional proxies for managerial diversion and audit pricing

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: CASH ETR_t					
	Managerial Diversion		Audit pricing			
	Overinvestment	Underinvestment	High total audit fees	Low total audit fees	High tax fees	Low Tax fees
M&A deals	**-0.035*** **	**0.010**	**–0.034*** **	**0.012**	**-0.036*** **	**0.002**
	(-5.589)	**(0.874)**	**(–9.973)**	**(1.404)**	**(-9.964)**	**(0.217)**
Constant	0.354***	0.464***	0.261***	0.334***	0.900***	0.194**
	(3.622)	(2.669)	(9.251)	(5.634)	(31.524)	(2.437)
Obs.	8,333	6,766	28,756	10,860	28,821	9,675
Adj. R-squared	0.129	0.050	0.041	0.040	0.037	0.037
Other controls	YES	YES	YES	YES	YES	YES
Industry Dummy	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES

Notes: Table 2-10 reports the additional analyses on the relationship between tax avoidance and M&A deals by using different proxies for managerial diversion and audit pricing. The additional proxies for managerial diversion is firm investments, for audit pricing include total audit fees and tax fees. They are divided into low or high subsamples if below or above the median. Variables are defined in Appendix 2.1. Robust *t*-statistics are in brackets. *, **, and *** denote two-tailed significance at $p<0.1$, 0.05 and 0.01, respectively

2.5 Conclusion

This study examines the relationship between corporate tax avoidance and M&A activities. Findings indicate that firms that participated in M&A transactions engage in tax avoidance in the current and subsequent one year after M&A deals. Additionally, firms do not engage in any tax avoidance practices the year before and the second year following M&As. In addition, acquiring firms have a higher level of corporate tax avoidance in the periods prior to the IRS Repurchase Legislation (IRS 2007–48). This study explores three channels that have the potential to moderate this relationship, namely, agency costs, managerial diversion and audit pricing. Using a number of measures of agency costs (i.e. high CEO compensation, low sales-to-assets ratio, high FCF, high cash holdings, high SG&A and high R&D expenses), I find that the positive relationship between M&A activity and tax avoidance is further increased in firms with high agency costs. Furthermore, acquiring firms with low performance and overinvestments (measures of managerial diversion) are more strongly related to tax avoidance. Finally, bidding firms with high audit fees, total audit fees and tax fees engage in more tax avoidance than their lower-fee counterparts. This study provides more insights into the factors that affect the strength of the relationship between M&A deals and tax avoidance.

2.6 Appendix

Appendix 2.1 Variable Definitions and Measurement

Variable	Definition
Dependent variables: Tax avoidance	
CASH ETR	The cash effective tax rate, measured as cash tax paid, divided by the pre-tax accounting income from operations, minus special items. *CASH ETR* is omitted when the denominator is zero or negative. It is truncated to the range 0–1 (McGuire et al. 2014).
Additional proxies of tax avoidance	
UTB	Unrecognised tax benefits scaled by lagged assets (Missing values are set to zero).
SHELTER	*SHELTER* is computed using Wilson's tax shelter model (Wilson 2009, Rego and Wilson 2012), which examines how a company's performance is related to tax sheltering actions. It is a dummy variable, coded as 1 if the firm's estimated sheltering probability is in the top quintile in that year; otherwise set to 0.
$CASH\ ETR_{t-1}$	The cash effective tax rate one year before M&A transaction occurs.
$CASH\ ETR_{t+1}$	The cash effective tax rate one year after M&A transaction occurs.
$CASH\ ETR_{t+2}$	The cash effective tax rate two years after M&A transaction occurs.
Independent variable: Mergers and acquisitions	
M&A deals	A dummy variable set to 1 if the firm had proposed undertaking M&A activity during year *t*; otherwise set to 0.
Control variables	
SIZE	Firm size, measured as the natural log of total assets at the beginning of the year.
LEV	Firm leverage, measured as long-term and short-term debt divided by total assets.
R&D	R&D ratio, measured as R&D expenses divided by total assets at the beginning of the year. (Missing values are set to zero.)
ROA	Return on assets, measured as the pre-tax income minus extraordinary items scaled by total assets.
MTB	Market-to-book ratio, measured as market value of equity divided by book value of equity.
FI	Foreign income, measured as foreign income scaled by total assets. (Missing values are set to zero).
CASH	Firm's cash holdings, defined as cash and marketable securities divided by total assets.
INTANG	Intangible assets divided by total assets.
Sale growth	Changes in sales from previous year.
NOL	A dummy variable, coded as 1 if the loss carried forward is positive at the beginning of the year; otherwise set to 0.
PPE	Property, plant, and equipment divided by sales.
ADV	Advertising expenses divided by sales (Missing values are set to zero).
EBITDA	Earnings before interest, taxes, depreciation, and amortisation divided by lagged assets.
CAPEX	Capital expenditures divided by gross property, plant, and equipment.
Proxies of agency costs	
High/Low CEO compensation	The natural log of the total compensation minus salary. High or low CEO compensation is ranked as above or below the median of the sample.
High/Low Sales-to-assets ratio	The ratio of sales over total assets. High or low sales-to-assets ratio is ranked as being above or below the median.

Variable	Definition
High/Low Free cash flow	Net income from operating activities minus common and preferred dividends divided by total assets. High or low free cash flow is ranked as above or below the median.
High/Low Cash holding	Cash and short-term investment divided by sales. High or low cash holding is ranked as above or below the median.
High/Low SG&A	The natural log of selling, general and administration (SG&A) expenses. High or low SG&A is ranked as above or below the median.
High/Low R&D	R&D expense divided by total assets. Missing values are set to zero. High or low R&D is ranked as above or below the median.
Proxies of managerial diversion	
High/Low Performance	Income before extraordinary items, divided by total assets minus tax paid, scaled by pre-tax accounting income from operations minus special items. High or low performance is ranked as above or below the median of the sample.
Overinvestment/ Underinvestment	Overinvestment/underinvestment represents that portion of the firm's investment that cannot be explained by its fundamentals. It is measured using the residuals of the regression model of Atwood and Lewellen (2019) with positive (negative) residuals referring to overinvestment (underinvestment).
Proxies of audit pricing	
High/Low Total Audit Fees	The natural log of the total audit fees. High or low total audit fees are ranked as above or below the median of the sample.
High/Low Audit Fees	The natural log of the audit fees. High or low audit fees are ranked as above or below the median of the sample.
High/Low Tax Fees	The natural log of the tax fees. High or low tax fees are ranked as above or below the median of the sample.

Chapter Three

3

The influence of restatements on audit pricing for firms engaging in M&A activities

3.1 Introduction

U.S. merger and acquisition (M&A) transactions, both in terms of volume and size, have increased significantly over the past two decades. For example, the value of global M&A deals hit $3.9 trillion in 2018, increasing 15.9% over that recorded period compared to the same period in the previous year[17]. Additionally, there were 14,143 M&A transactions totaling US$2.03 trillion completed during the 12-month period ending 30 June 2019[18]. In the first quarter of 2020, the United States was the most acquisitive country, accounting for 45% of worldwide private equity volume, and the $18.9 billion sale of ThyssenKrupp Elevator AG was the region's largest private equity deal[19]. The acquisition process can involve significant complexity (Cai et al. 2016) and uncertainties pertaining to the integration of operational, financing and investment activities (Cai et al. 2016, Wu et al. 2020), and is likely to lead to increased audit risk, requiring increased audit effort and expertise to complete the audit effectively.

Using a large sample of firms over the period of 2000–2019, I find that firms do not pay higher audit fees in the year immediately prior to the occurrence of an M&A deal. However, they do incur higher audit fees in the year that a takeover is announced and, also, the year following that deal. The results are robust across several audit fee measures, such as: change in audit fees, audit fees ratio, and total audit and non-audit fees. Propensity score matching (PSM), the Heckman test and a difference-in-difference (DID) test confirm the base-level results and, collectively, alleviate endogeneity or self-selection bias concerns, given that the results could be affected by omitted variable bias, model misspecification or reverse causality. I further find that the positive association between audit fees and M&As is moderated by the existence of financial restatements. Acquiring firms with financial restatements are expected to have higher audit fees. Additionally, the results show that acquiring firms with specific types of restatements, namely, restatements occurring for accounting rule application failures, or restatements related to adverse effects in financial statements, or restatements related to errors in accounting and clerical applications (misrepresentations), are charged higher audit fees. The positive relationship between the interaction of M&A activity with financial restatements and audit fees is further enhanced in firms with internal control material weaknesses, in firms using non-Big4 audit firms, in firms with offices in a state (or city) different from that of their auditors, and in firms with higher agency costs. I use a number of proxies for agency costs, such as cash holdings, CEO compensation, board compensation and board size.

[17] Bloomberg. "Global M&A Market Review 2018." Retrieved 26 May 2021, from https://data.bloomberglp.com/professional/sites/10/Bloomberg-Global-MA-Legal-Ranking-1st-3Q2018.pdf.

[18] Factset. "US M&A News and Trends." Retrieved 26 May 2020, from https://www.factset.com/hubfs/mergerstat_em/monthly/US-Flashwire-Monthly.pdf

[19] Bloomberg. "Global M&A Market Review Q1 2020." Retrieved 27 May 2021, from https://www.bloomberg.com/press-releases/2020-04-01/bloomberg-global-m-a-mid-market-legal-rankings-q1-2020.

This study contributes to the literature in several important ways. Prior research (Firth 2002, Fields et al. 2004) shows that audit effort is likely to increase following M&As. However, this research did not investigate the channels through which this association could potentially operate. This study extends and contributes significantly to prior research in this area in a number of ways. First, this study examines audit pricing in firms that engaged in acquisitions both pre and post-takeover announcements. I find that acquiring firms experience higher audit fees in the year of acquisition and one year subsequent to the occurrence of a M&A deal, but not in the year immediately prior to a takeover announcement. These results demonstrate that the occurrence of M&A deals is likely to lead to higher audit fees. Second, I investigate how financial restatements could potentially affect audit fees charged in acquiring firms. The results show that firms with financial restatements that engaged in M&A activity, incur significantly higher audit fees. Primarily, this relationship is driven by the occurrence of restatements related to accounting rule application failures, restatements related to an adverse effect on the financial statement (financial statement materiality) or restatements related to errors in accounting and clerical applications. This study responds to the call from (Hay et al. 2006, DeFond and Zhang 2014, Habib et al. 2020) to further examine the impact of audit fees in firms engaging in M&A deals, given that these deals are likely to have flow-on consequences on governance, internal control, transparency and business risk (Gaver and Paterson 2007). Third, this study extends the work of Habib et al. (2020) by examining the channels that potentially could affect the relationship between audit fees, M&A deals and financial restatements. These channels include: strength of internal control material weaknesses (ICMW), level of audit quality (Big4 or non-Big4), geographical location of audit offices, and agency costs. The audit fees in acquiring firms with financial restatements are higher in firms with internal control material weaknesses, in firms that employ non-Big4 auditors, in firms located in a city (state) different from that of their auditors and in firms with higher agency costs.

Finally, the findings of this study will be of importance to a range of stakeholders. Given that M&As involve revaluation of assets and liabilities, valuation of new assets, and efficiency and risk assessments relating to the integration of business units, the findings will be of interest to investors, analysts, financial controllers and regulators. In particular, analysts will be interested in the likelihood of successful integration and continuity of business functions post-acquisition. Inefficiencies in the achievement of operational synergies, and increased complexity and uncertainty associated with integration, are likely to reflect increased operational risks and, consequently, higher audit fees. This may be reflected additionally in the increased occurrence of financial restatements and the requirement to restate material deficiencies. Further, the mapping of the audit pricing-M&A relationship before, during and after an M&A occurrence will be of interest to auditors, as they act as

information repositories for their clients and, hence, the continuity and interpretation of that information will be of importance to them, as firms transition through M&A deals.

The remainder of this chapter is structured as follows. Section 3.2 reviews the literature and develops the hypotheses. The sample selection and the regression model are discussed in Section 3.3. The empirical results, robustness check and cross-section tests are presented and discussed in Section 3.4. Finally, Section 3.5 concludes the study.

3.2 Literature Review and Hypotheses Development

3.2.1 The effect of restatements on the relationship between M&As and audit pricing

M&As are dynamic and complex phenomena with a high propensity to fail (Cartwright and Schoenberg 2006, Angwin 2007, Nguyen et al. 2012, Anagnostopoulou and Tsekrekos 2015). Auditor effort (i.e. audit hours and audit fees) is likely to increase as a consequence of M&A activities (Firth 2002). This is because M&A activities often require changes to the accounting, information, governance and management structures of the client (Pong and Whittington 1994, Firth 2002). Auditors require greater effort to understand how these systems have changed as a result of such deals (Firth 2002, Francis 2004). In particular, they will need to become familiar with the integration of both accounting information and internal control systems of target firms into those of acquiring firms, following the completion of takeovers (Cai et al. 2016).

Financial restatements constitute modifications in accounting transactions and in reporting structures as a consequence of accounting errors, fraud or irregularities (Hennes et al. 2008, Paik et al. 2018, Habib et al. 2020). Palmrose and Scholz (2004) differentiate restatements for core earnings from those for non-core earnings. Core restatements include misstatements of revenue; selling, general and administrative (SG&A) expenses; cost of goods sold; and other essential operating costs. In contrast, non-core restatements cover misstatements of special, one-time transactions, such as restructuring, asset impairments, mergers and acquisitions, and extraordinary items (Palmrose and Scholz 2004).

Prior research finds a positive relationship between audit fees and financial restatements, which means that more audit effort is required by auditors to find errors or omissions that may lead to restatements (Venkataraman et al. 2008, Feldmann et al. 2009, Asthana and Boone 2012). Hribar et al. (2014) find that the relationship between abnormal auditing and restatements is positive and significant. Economic bonding between auditor and client can create a situation in which the auditor does not exercise the adequate professional skepticism needed to interpret audit evidence correctly, or to assess evidence impartially (Bazerman et al. 1997). Consequently, high audit fees may

compromise the independence of auditors, and this could increase the likelihood of errors or omissions, with consequent requirements to restate (Habib et al. 2020).

Auditing Statement No.107 allows auditors to evaluate the likelihood of material misstatement and to change their audit plan accordingly[20]. In this regard, when auditors conclude that there is substantial audit risk, the audit procedures must be changed to collect more evidence, thus, raising audit engagement hours. If misstatements are subsequently found, the higher fees can compensate the auditor for future litigation and/or reputational damage (Simunic and Stein 1996). Prior research indicates that higher audit fees relate positively with higher risk clients (Bell et al. 2001, Niemi 2002, Hay et al. 2006) and higher audit fees are incurred by firms that are less operationally effective and involved in acquisition decisions (Fields et al. 2004). Bedard and Johnstone (2004) show that audit effort is increased where there is evidence of earnings-related risk and corporate governance risk. Higher audit fees are incurred by firms that disclose significant failure in their internal controls which can lead to an increased probability of financial restatement (Raghunandan and Rama 2006, Hogan and Wilkins 2008).

This study argues that financial restatements would lead to higher audit risk in M&A firms and, thus, to higher audit fees. Prior research indicates that auditors consider restatement firms to be riskier than non-restatement firms (Hribar et al. 2014, Habib et al. 2020), and restatements could result in higher audit fees. Taken together, the first hypothesis in this study is stated as:

H1: The positive relationship between M&A activities and audit fees is magnified in firms with financial restatements.

3.2.2 The effect of other channels on the relationship between the interaction of M&As and restatements and audit pricng

The determination of acquisition price is a dynamic and subjective process, based on management evaluation and expertise (Goodman et al. 2014). Inefficient and inadequate managerial due diligence could lead to costly M&A deals for acquiring firms. Internal control deficiencies may reveal weaknesses in the management policies, processes and systems required to effectively deal with M&As (Caplan et al. 2018). The presence of internal control material weakness (ICMW) may signal a lack of management competence, as management is in charge of creating and enforcing successful internal controls (Feng et al. 2009, Caplan et al. 2018). Prior research indicates that if firms disclose the existence of material deficiencies in internal controls, they tend to pay higher audit fees (Raghunandan and Rama 2006, Balakrishnan and Gruca 2008, Hogan and Wilkins 2008). This is consistent with claims that inadequate internal controls increase the probability that errors will occur,

[20] AICPA. "Pre-Clarity Statements on Auditing Standards." Retrieved 31 March 2021, from https://www.aicpa.org/research/standards/auditattest/sas.html.

intentionally or inadvertently, requiring greater audit work and increasing audit risk. Heller (2015) finds that the focus on internal checks has caused auditors to undertake more control testing which, in turn, raises client compliance costs and internal audit fees.

Previous research shows that Big4 accounting firms deliver better quality audits compared with their counterparts (DeFond et al. 2002, Francis and Yu 2009, Choi et al. 2010, Hay 2013). Auditors in Big4 firms are more likely to enforce the implementation of generally accepted accounting principles (GAAP) correctly, and this could minimise their risk of restatements (Francis et al. 2013). Eshleman and Guo (2014) find that clients of Big4 audit firms are less likely to issue an accounting restatement and more likely to receive better audit quality. This evidence suggests that Big4 audit firms help clients to reduce the probability of future restatements.

The location of audit firms can potentially affect the level of audit fees (Che-Ahmad and Houghton 1996). Auditor location can influence the audit cost through the effort required to communicate and meet with clients (Palmrose 1986, Goodwin and Wu 2014). This study argues that the geographical location of the auditor could affect the relationship between M&A deals and audit fees, because the informational benefits resulting from geographical proximity help auditors to gain awareness of client-specific characteristics, such as: financial reporting compliance impediments and audit risks. Such knowledge can be established in various ways when an auditor shares the same state as clients. Visits to clients can be made more often, lowering the cost of engagement. Geographical proximity offers opportunities to build personal and social relationships with clients (Hong et al. 2004).

Harford (1999) posits that firms with greater cash holdings are more likely to acquire, and their acquisitions are more likely to be value-decreasing. Dittmar and Mahrt-Smith (2007) state that shareholders allocate a lower valuation to an extra dollar in cash savings when agency expense concerns are prevalent. Management may retain cash to be used for their own purposes, such as empire-building, rather than for distribution to shareholders (Jensen 1986). Firms with high cash holdings tend to have more agency-related issues (Dittmar et al. 2003), indulge in value-destroying acquisitions (Harford 1999), and have cash worth less than its value (Pinkowitz et al. 2003, Faulkender and Wang 2006, Dittmar and Mahrt-Smith 2007). Consequently, managers tend to enforce less traditional accounting procedures (Ahmed and Duellman 2013), restate financial statements (Presley and Abbott 2013) and misreport earnings (Schrand and Zechman 2012). Higher audit fees can result, as a consequence of increased complexity and audit risk owing to greater cash holdings (Hay et al. 2006). Taken together, the second hypothesis in this study is stated as follows:

H2: The positive relationship between the interaction of financial restatements and M&A activities and audit fees is moderated by:

a. *Strength of the internal control material weakness (ICMW) restructures;*

b. *Level of audit quality;*

c. *Geographical location of auditor offices; and*

d. *Agency effects.*

3.3 Research design

3.3.1 Sample selection and data

Data was accessed from several sources. Thomson Reuters SDC Platinum was used to obtain all M&A transactions announced by listed U.S. firms over the 20-year period from January 2000 to December 2019. Following the approach adopted in previous literature (Bris 2005, King 2009, Shen et al. 2014), I included all completed M&A transactions, but removed leveraged buyouts, spinoffs, exchange offers, recapitalisations, self-tenants, repurchases, remaining interest acquisitions, acquisitions of minority shares, and privatisations (42,501 firm-year observations). I exclude multiple takeover announcements (13,411 firm-year observations) and announcements of firms in financial and utility industries (6,391 firm-year observations), i.e., two-digit SIC codes 49 and 60 to 69. The sample was further decreased by 12,016 firm-year observations after incorporating financial data from Compustat that is needed for the regression analysis. The final M&A sample consists of 10,683 firm-year observations.

The control sample in this study covers all U.S. firms in the Compustat database for the period of 2000–2019, giving a total of 173,810 firm-year observations. I excluded companies with two-digit sector codes of 49 and 60-69 from the utility and financial sectors (66,843 firm-year observations). Utility firms were omitted because they usually have large debt levels in their capital structures. Owing to major differences in their use of accounting policies and accounting estimates, and their regulatory and capital requirements, financial institutions were also removed. The sample was then merged with the Audit Analytics dataset, which contained the audit and restatement variables. I further removed 46,253 firm-year observations where critical data was missing. The final control sample consists of 60,714 firm-year observations. A summary of the final sample derivation is provided in Panel A of Table 3-1.

Panel B, Table 3-1 provides the sample distribution based on the (Fama and French 1997) 48 industry classification. The majority of firms in the full sample are in the Business Services sector (16.79%), followed by Pharmaceutical Products (9.77%) and Electronic Equipment (7.73%). For the M&A sample, most bidding firms are from the Business Services sector (22.60%), then Electronic Equipment (7.83%) and Petroleum and Natural Gas (5.86%).

Table 3-1 Sample Specifications and Industry distribution

Panel A: Sample selection	
Original sample [from Compustat (2000–2019)]	173,810
Less financial and utility firms (SIC codes 60–69 and 49)	(66,843)
Less firms for which accounting data for the regression analysis is missing	(46,253)
Control sample	**60,714**
M&A announcements [from SDC Platinum (2000–2019)]	42,501
Less multiple acquisitions announced by firms	(13,411)
Less financial and utility firms (SIC codes 60–69 and 49)	(6,391)
Less firms with missing accounting data	(12,016)
M&A sample	**10,683**

Panel B: Industry distribution

Full sample	**N**	**%**	**M&A sample**	**N**	**%**
Business Services	10,191	16.79	Business Services	2,414	22.60
Pharmaceutical Products	5,933	9.77	Electronic Equipment	863	7.83
Electronic Equipment	4,694	7.73	Petroleum and Natural Gas	626	5.86
Petroleum and Natural Gas	3,633	5.98	Computers	604	5.65
Retail	3,237	5.33	Wholesale	551	5.16
Medical Equipment	2,928	4.82	Pharmaceutical Products	510	4.77
Wholesale	2,229	3.67	Retail	477	4.18
Computers	2,413	3.97	Communication	461	4.32
Machinery	2,183	3.60	Machinery	449	4.20
Remaining industries	23,273	38.33	Remaining industries	3,728	34.89
Total	**60,714**	**100.00**	**Total**	**10,683**	**100.00**

Note: Panel A presents sample selection; Panel B presents the industry distribution of the sample.

3.3.2 Measurement of variables

3.3.2.1 Dependent variable: Audit price

Following prior literature, audit fees have been measured as the natural logarithm of fees paid to the external auditor (Menon and Williams 2001, Firth 2002, Fields et al. 2004, Gotti et al. 2012, Alexeyeva and Svanström 2015, Mitra et al. 2019). Additionally, the change in audit fees, the ratio of non-audit fees to audit fees, and total fees, are adopted as alternative measures of audit fees in this study (Maher et al. 1992, Srinidhi and Gul 2006, Huang et al. 2009). Detailed definitions of these variables are in Appendix 3.1.

3.3.2.2 Independent variable: The occurrence of M&As

In this study, the independent variable is the occurrence of mergers and acquisitions, *M&A deals*, a dummy variable set to 1 if the firm has made any M&A announcements during the year, otherwise set to zero. I investigate how the relationship between M&A activity and audit fees is moderated by the existence of restatements (*RES*), a dummy variable set to 1 if the firm recorded a financial restatement during the year, otherwise set to zero. In cross-sectional tests, I further examine how the relationship between M&A deals and audit fees in the presence of restatements is moderated

by internal control material weakness (*ICMW*), audit quality *(Big-4)*, geographical location and agency factors. Appendix 3.1 contains definitions of these variables.

3.3.2.3 Control variables

Based on prior audit fee research (Simunic 1980, Menon and Williams 2001, Firth 2002, Fields et al. 2004, Hay et al. 2006, Gotti et al. 2012, Beck et al. 2013, Bentley et al. 2013, Alexeyeva and Svanström 2015, Jung et al. 2016, Mitra et al. 2019), I control for variables that could affect audit fees. The control variables consist of firm size (*SIZE*), loss (*Loss*), leverage (*LEV*), December year end *(YE)*, return on assets (*ROA*), ratio of current assets to total assets (*Current*), ratio of current assets less inventories and prepaid expenses to current liabilities (*Quick ratio*), market growth (*MG*), number of business segments (*SEG-count*) and geographic segments (*GEO-count*), Big-4 auditors, auditor going-concern opinion records (*Going Concern*), foreign sales (*F-sales*), discretionary accruals (*DAC*), account receivable (*ARTA*), and inventory (*INTA*). Definitions of these control variables are in Appendix 3.1.

3.3.2.4 Empirical model

To confirm the relationship between M&A deals and audit fees, the following baseline ordinary least squares (OLS) regression model is estimated:

$$\begin{aligned} Audit\ fees_{i,t} = a_{0\,i,t} + \beta_1 M\&A\ deals_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 Loss_{i,t} + \beta_4 LEV_{i,t} \\ + \beta_5 YE_{i,t} + \beta_6 ROA_{i,t} + \beta_7 Current_{i,t} + \beta_8 Quick\ ratio_{i,t} \\ + \beta_9 \mathrm{MG}_{i,t} + \beta_{10}\ SEG - count_{i,t} + \beta_{11}\ GEO - count_{i,t} \\ + \beta_{12}\ Big - 4_{i,t} + \beta_{13} Going\ Concern_{i,t} + \beta_{14} F - sales_{i,t} \\ + \beta_{15} DAC_{i,t} + \beta_{16} ARTA_{i,t} + \beta_{17} INTA_{i,t} + IND_{FE} + YEAR_{FE} \\ + \varepsilon_{i,t} \end{aligned} \quad \text{(Equation 3.1)}$$

To investigate the impact of financial restatements on the association between M&A deals and audit fees (H1), the following model is estimated:

$$\begin{aligned} Audit\ fees_{i,t} = a_{0\,i,t} + \beta_1 M\&A\ deals_{i,t} + \beta_2 RES_{i,t} + \beta_3 M\&A\ deal_{i,t} \times RES_{i,t} \\ + \beta_4 CONTROLS_{i,t} + IND_{FE} + YEAR_{FE} + \varepsilon_{i,t} \end{aligned} \quad \text{(Equation 3.2)}$$

To examine the effect of other channels on the relationship between M&A activity and audit fees in the presence of financial restatements (H2), I perform subsample analyses and re-estimate equation (3.2) for each of two subsamples. In particular, the original sample is partitioned into the two sub-samples of firms with ICMW and without ICMW; firms with Big4 versus non-Big4 auditors; firms

having the same state versus a different state location as their auditors; firms with high versus low agency costs (i.e. high versus low cash-holding).

All variables in equations (3.1) and (3.2) are defined in Appendix 3.1. I control for the fixed effects of both year and industry in all of the regression analyses. The 1st and 99th percentiles are winsorized for all variables to decrease the potential effect of outliers on the results.

3.4 Empirical analyses

3.4.1 Descriptive statistics

The descriptive statistics of the full sample are provided in Table 3-2. Generally, they are close to the values stated in previous research (Simunic 1980, Menon and Williams 2001, Firth 2002, Fields et al. 2004, Hay et al. 2006, Gotti et al. 2012, Beck et al. 2013, Bentley et al. 2013, Alexeyeva and Svanström 2015, Jung et al. 2016, Mitra et al. 2019). The average value of audit fees (as the natural logarithm) for firms in the sample is 13.144, which is equivalent to $510,936. In the sample, there are, on average, 17.6% of firms that had M&A activities, and this is consistent with prior literature (Bentley et al. 2013, Mitra et al. 2019). Approximately 8.5% of firms in the sample received financial restatements, and this figure is similar to that reported in previous studies (Francis et al. 2013, Carver 2014). For the control variables, the average value of firm size is 5.356 (natural logarithm), which equals to $211.87 million. There are, on average, 44.8% of firms that report financial losses during the year, and 68.8% of firms had their financial year ending in December. The average value of firm financial leverage is 32.9%, and that of ROA is -0.30%. Firms in the sample have an average current assets ratio of 51.4% and a quick ratio of 234.6%. The sample firms, on average, have a sales growth of 24.5% and their ratio of account receivable to total assets is 14.2%. Furthermore, the ratio of inventory to total assets is 10.5%. The average number of business segments is 12.15, and that of geographical segments is 1.84. Moreover, 66.2% of firms had their financial statements audited by one of the Big4 auditors, and around 10.9% of firms received a going concern opinion from their auditors. There are, on average, 40.1% of firms that report foreign sales during the year and the mean value of discretionary accruals in the sample is 0.037.

Table 3-2 Descriptive Statistics

Variable	N	Mean	S.D	min	p25	Median	p75	max
Audit Fees	60,714	13.144	1.497	7.824	12.046	13.211	14.221	16.576
M&A deals	60,714	0.176	0.381	0.000	0.000	0.000	0.000	1.000
RES	60,714	0.085	0.280	0.000	0.000	0.000	0.000	1.000
Loss	60,714	0.448	0.497	0.000	0.000	0.000	1.000	1.000
ROA	60,714	-0.300	1.390	-11.931	-0.155	0.021	0.091	0.417
SIZE	60,714	5.356	2.544	-2.703	3.711	5.515	7.150	10.748
YE	60,714	0.688	0.463	0.000	0.000	1.000	1.000	1.000
LEV	60,714	0.329	0.656	0.000	0.010	0.180	0.379	5.194
Current	60,714	0.514	0.261	0.019	0.304	0.511	0.724	1.000
Quick ratio	60,714	2.346	3.149	0.006	0.852	1.419	2.568	28.426
MG	60,714	0.245	1.073	-0.996	-0.053	0.067	0.225	8.724
SEG-count	60,714	12.157	9.396	1.000	6.000	9.000	17.000	113.000
GEO-count	60,714	1.842	1.492	0.000	1.000	2.000	2.000	20.000
Big4	60,714	0.662	0.473	0.000	0.000	1.000	1.000	1.000
Going Concern	60,714	0.109	0.311	0.000	0.000	0.000	0.000	1.000
F-sales	60,714	0.401	0.490	0.000	0.000	0.000	1.000	1.000
DAC	60,714	0.037	0.514	-3.875	-0.040	0.013	0.128	2.348
ARTA	60,714	0.142	0.122	0.000	0.050	0.116	0.197	0.625
INTA	60,714	0.105	0.132	0.000	0.000	0.055	0.161	0.638

Notes: This table reports descriptive statistics for all variables that used in main analyses. All Variable definitions are presented in Appendix 3.1.

3.4.2 Correlation analysis

The Pearson pairwise correlation matrix is presented in Table 3-3. The independent variable, *M&A deals*, is positively correlated with audit fees (at $p<0.01$), indicating that firms with M&A transactions incur higher audit fees. For all variables in the model, I examine the variance inflation factors (VIFs) to mitigate the concerns of multicollinearity (Judge et al. 1988, Neter et al. 1990, Lyon and Maher 2005). The VIF value of 1 indicates that a regression coefficient is orthogonal to all others, so the regression analysis has zero collinearity, and VIF values greater than 5 imply substantial collinearity (Judge et al. 1988). I find (for a brief discussion, see Judge et al. 1988, Neter et al. 1990, Lyon and Maher 2005) that all of the variables are within acceptable limits, with the biggest VIF being 3.72 for firm size (*SIZE*).

3.4.3 Regression analysis

3.4.3.1 Association between M&A activities and audit pricing

Prior to investigating the potential underlining effects, I first established the known positive relationship between audit fees and M&As (Firth 2002, Fields et al. 2004). The results are documented in Table 3-4 with different measures of audit fees, i.e., the natural logarithm of audit fees, change in audit fees, ratio of non-audit fees to audit fees, and the natural logarithm of audit and non-audit fees (total fees). For each measure of audit fees, I run two separate regression analyses for

the model with and without control variables. The results indicate that the coefficient of the *M&A deals* variable is significantly positive (at $p<0.01$) across all four measures of audit fees, indicating that firms engaging in mergers and acquisitions (M&As) are more likely to have higher audit fees. The results extend prior findings in the literature on the relationship between audit fees and M&As (Firth 2002, Fields et al. 2004). The estimated coefficients of control variables are generally consistent with those in previous literature (Simunic 1980, Menon and Williams 2001, Firth 2002, Fields et al. 2004, Hay et al. 2006, Gotti et al. 2012, Bentley et al. 2013, Alexeyeva and Svanström 2015, Mitra et al. 2019). For example, I find that larger firms with higher net operating losses, higher current assets to total assets, a going concern opinion, Big-4 audit firms, and a December year-end have higher levels of audit fees (at $p \leq 0.10$).

Table 3-3 Pearson Correlation Matrix

	Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1)	Audit Fees	1.000																		
(2)	M&A deals	0.252*	1.000																	
(3)	RES	0.021*	-0.008	1.000																
(4)	Loss	-0.304*	-0.167*	0.042*	1.000															
(5)	ROA	0.314*	0.102*	-0.033*	-0.317*	1.000														
(6)	SIZE	0.858*	0.266*	-0.019*	-0.416*	0.480*	1.000													
(7)	YE	0.087*	0.019*	-0.004	0.075*	-0.028*	0.053*	1.000												
(8)	LEV	-0.173*	-0.069*	0.032*	0.180*	-0.616*	-0.285*	0.042*	1.000											
(9)	Current	-0.256*	-0.132*	-0.034*	0.133*	-0.105*	-0.393*	-0.104*	-0.089*	1.000										
(10)	Quick ratio	-0.117*	-0.046*	-0.035*	0.057*	0.094*	-0.075*	0.026*	-0.206*	0.351*	1.000									
(11)	MG	-0.096*	-0.011*	0.014*	0.071*	-0.054*	-0.093*	0.051*	0.004	0.024*	0.038*	1.000								
(12)	SEG-count	0.485*	0.140*	-0.007	-0.236*	0.197*	0.457*	-0.002	-0.134*	-0.105*	-0.082*	-0.098*	1.000							
(13)	GEO-count	0.314*	0.084*	-0.017*	-0.137*	0.174*	0.319*	-0.013*	-0.121*	-0.060*	-0.056*	-0.075*	0.532*	1.000						
(14)	Big4	0.578*	0.152*	-0.021*	-0.221*	0.251*	0.597*	0.055*	-0.171*	-0.133*	0.015*	-0.066*	0.276*	0.221*	1.000					
(15)	Going Concern	-0.365*	-0.138*	0.045*	0.337*	-0.511*	-0.496*	0.026*	0.422*	0.033*	-0.148*	0.081*	-0.232*	-0.189*	-0.322*	1.000				
(16)	F-sales	0.507*	0.149*	-0.004	-0.178*	0.168*	0.412*	-0.009	-0.123*	0.007	-0.045*	-0.078*	0.488*	0.402*	0.285*	-0.209*	1.000			
(17)	DAC	0.050*	0.016*	-0.035*	-0.104*	0.367*	0.075*	0.005	-0.179*	0.029*	0.069*	-0.035*	0.027*	0.031*	0.058*	-0.151*	0.036*	1.000		
(18)	ARTA	-0.060*	0.012*	-0.003	-0.085*	0.048*	-0.139*	-0.059*	-0.015*	0.347*	-0.164*	-0.040*	0.078*	0.073*	-0.111*	-0.019*	0.099*	0.021*	1.000	
(19)	INTA	-0.072*	-0.055*	-0.005	-0.093*	0.036*	-0.069*	-0.212*	-0.008	0.328*	-0.177*	-0.064*	0.059*	0.035*	-0.081*	-0.012*	0.019*	-0.012*	0.134*	1.000

Note: This table presents the Pearson correlations matrices among audit fees, M&A deal and all other control variables. * shows significance at the 0.01 level. All variable definitions are in Appendix 3.1.

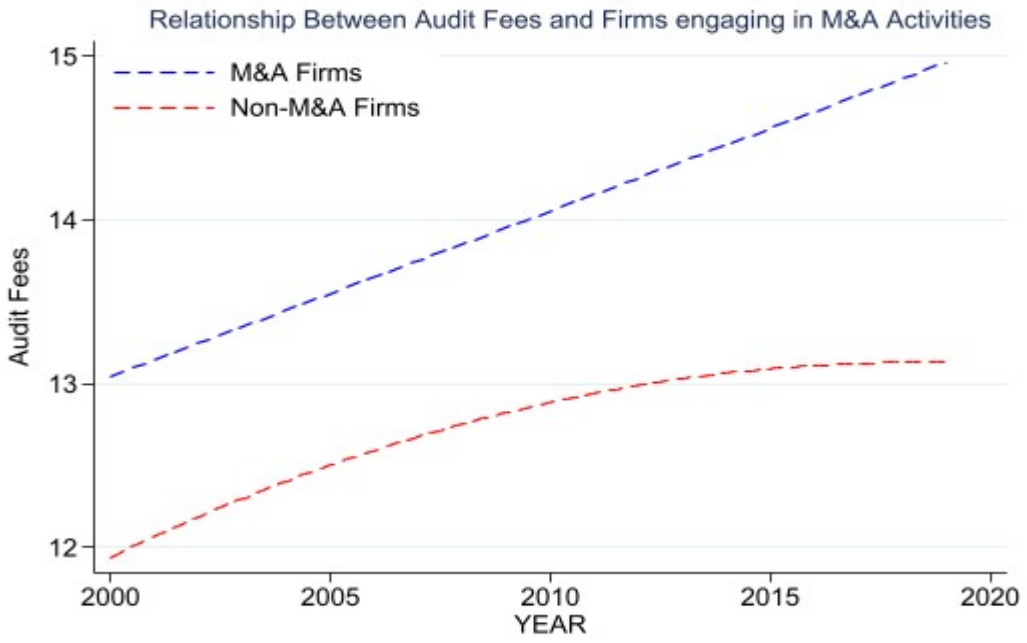
Table 3-4 Regression Results – The effect of M&A deals on audit pricing

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	**Audit Fees**		**Change in Audit Fees**		**Audit Fees Ratio**		**Total Fees**	
M&A deals	**0.971*** **	**0.068*** **	**0.068*** **	**0.053*** **	**0.022*** **	**0.008*** **	**1.039*** **	**0.092*** **
	(73.427)	**(10.906)**	**(14.901)**	**(10.967)**	**(21.296)**	**(7.136)**	**(75.907)**	**(14.709)**
Loss		0.155***		0.004		-0.007***		0.148***
		(27.111)		(0.967)		(-6.627)		(26.265)
ROA		-0.074***		-0.003		-0.005***		-0.082***
		(-22.535)		(-0.962)		(-6.763)		(-25.218)
SIZE		0.473***		0.005***		0.010***		0.502***
		(244.986)		(3.351)		(32.403)		(260.791)
YE		0.116***		0.003		-0.013***		0.078***
		(20.972)		(0.786)		(-14.058)		(14.244)
LEV		0.046***		-0.007		0.001		0.051***
		(8.515)		(-1.581)		(0.643)		(9.583)
Current		0.469***		-0.016		-0.009***		0.486***
		(28.635)		(-1.163)		(-3.192)		(30.180)
Quick ratio		-0.035***		0.002**		-0.000		-0.035***
		(-30.713)		(2.227)		(-1.294)		(-31.566)
MG		-0.021***		0.051***		0.001**		-0.017***
		(-7.702)		(18.106)		(2.075)		(-6.454)
SEG-count		0.010***		-0.001***		0.000		0.010***
		(31.215)		(-3.349)		(0.011)		(29.510)
GEO-count		0.008***		0.002		0.002***		0.018***
		(3.755)		(1.492)		(6.328)		(8.898)
Big4		0.384***		0.036***		-0.014***		0.364***
		(52.280)		(6.295)		(-11.094)		(50.816)
Going Concern		0.153***		-0.028***		0.001		0.148***
		(13.634)		(-3.001)		(0.502)		(13.479)
F-sales		0.268***		-0.007		-0.001		0.255***
		(41.844)		(-1.416)		(-1.309)		(40.684)
DAC		0.034***		-0.021***		0.001		0.034***
		(5.568)		(-4.167)		(0.737)		(5.620)
ARTA		0.256***		0.005		0.011**		0.237***
		(9.044)		(0.227)		(2.304)		(8.510)
INTA		-0.312***		-0.015		-0.030***		-0.410***
		(-11.256)		(-0.689)		(-6.053)		(-14.891)
Constant	11.857***	8.872***	0.007	-0.033	0.986***	0.956***	12.584***	9.497***
	(90.164)	(157.566)	(0.212)	(-0.935)	(107.329)	(104.906)	(91.689)	(171.061)
Obs.	60,714	60,714	56,825	56,825	51,439	51,439	60,714	60,714
Adj. R-squared	0.203	0.847	0.064	0.080	0.167	0.205	0.162	0.852
Industry Dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES	YES	YES

Note: This table presents the regression results of audit fees and M&A deals. Variable definitions are described in Appendix 3.1. Variance inflation factors (VIFs) do not suggest multicollinearity in the data. Coefficient estimates are reported with t-statistics in parentheses. Statistical significance of the estimates is 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.

Figure 3-1 shows the relationship between audit fees and M&A firms (or non-M&A firms). It is clear that audit fees for firms engaging in M&A activities are higher than those for firms not involved in M&A transactions. Figure 3-1 further indicates that firms undertaking M&As are more likely to have higher audit fees.

Figure 3-1 Audit fees – M&A firms vs non-M&A firms



Sources: Compustat and Audit Analytic Databases

3.4.4 Robustness checks

3.4.4.1 Robustness checks for the results of M&A activities and audit price

In this section, I use three robustness tests for checking the results in Table 3-4. Firstly, I employ a propensity score matching (PSM) method to mitigate the possibility that self-selection bias could affect the results shown in Table 3-4 (Shipman et al. 2017). I estimate propensity scores by applying a probit regression to predict the likelihood of occurrence of M&A deals. I match firms with M&A deals (treatment group) with firms that do not have M&A deals (control group) using propensity scores developed in the first stage probit model. I use a 1% caliper in the matching process. I then re-estimate Equation (3.1) using the PSM sample and report the findings of the PSM sample in Column 1 of Table 3-5. I find that the coefficient of the *M&A deals* variable is strongly positive (at $p<0.01$), suggesting that firms engaging in M&A activities incur higher audit fees.

Secondly, I adopt the Heckman analysis in order to mitigate the risk of self-selection bias (Heckman 1979). In the first stage, the likelihood of a firm involved in a M&A is estimated from a probit model, with all the variables on the right hand side of Equation 3.1 being used as determinants. Based on the estimation of the first stage, I calculate an inverse Mills ratio (*Mills-ratio*) and add it as

a determinant in the second stage regression model. The inverse Mills ratio governs the impact of the measurable determinants of a firm's decision to make acquisitions, on its relationship with audit fees. Columns (2) and (3) of Table 3-5 present the outcomes of the first and second stages of the Heckman analysis, respectively. The coefficient of the *M&A deals* variable is strongly positive (at p<0.01), indicating that the results in Table 3-4 remain robust after controlling for self-selection bias using the Heckman test.

Finally, to further control for possible endogeneity, I perform a difference-in-difference (DID) test (Roberts and Whited 2013) using the global financial crisis (GFC) as an exogenous shock. Although there is a paucity of research on audit pricing after the GFC (Sikka 2009), and the evidence is mixed (Xu et al. 2013, Krishnan and Zhang 2014), it can be argued that firms are subject to increased auditor monitoring during and following crises, and this can lead to higher fees, owing to the increased effort and hours expended on the audit process (Alexeyeva and Svanström 2015). On the other hand, lawsuit risk is potentially greater during times of economic recessions, as financial markets suffer sharp declines in stock values (Filip and Raffournier 2014). Changes in economic conditions could influence the need for audit and consultancy services for clients, as well as the level of perceived audit risks, and the level of market competition (Abdel-Khalik 1990, Srinidhi and Gul 2006). Such situations may theoretically influence the variety of required services, and affect their costs (Alexeyeva and Svanström 2015).

I separate the sample into two sub-periods to perform the DID analysis: 2000-2007 (before the GFC) and 2008-2019 (after the GFC). The dummy variable *TIME* is coded 1 for observations in the 2008-2019 period, and 0 for the 2000-2007 period. In order to observe the disparity in audit fees between treatment and non-treatment groups, before and after the year 2008, I create an interaction term, *M&A deals*TIME,* the coefficient of which represents the difference-in-difference. The following regression model is thus estimated as follows:

$$Audit\ fees_t = \beta_0 + \beta_1 M\&A\ deals_t + \beta_2 TIME_t + \beta_3 M\&A\ deals_t * TIME_t + \beta_{3-14} CONTROLS_t + \beta_m IND\ DUMMIES + \varepsilon_{i,t} \quad \text{(Equation 3.3)}$$

The regression results of model (3.3) are shown in Column (4) of Table 3-5. The coefficient of the interaction term, *M&A deals*TIME,* is significantly positive (at p<0.01), indicating that audit fees for M&A firms are significantly higher after the GFC.

Table 3-5 M&A activity and audit fees – Endogeneity tests

	Dependent variable: Audit Fees			
	PSM	**Heckman**		**DID**
		First stage	Second stage	
	(1)	**(2)**	**(3)**	**(4)**
M&A deals	**0.057*** **		**0.062*** **	**0.064*** **
	(7.534)		**(9.95)**	**(5.487)**
Mills-ratio			0.508***	
			(5.94)	
TIME				0.365***
				(57.569)
TIME* M&A deals				0.049***
				(3.765)
Loss	0.154***	-0.175***	0.087***	0.152***
	(14.465)	(-10.81)	(6.85)	(26.732)
ROA	-0.166***	-0.036**	-0.086***	-0.074***
	(-9.145)	(-2.02)	(-22.87)	(-22.667)
SIZE	0.497***	0.182***	0.547***	0.472***
	(155.135)	(37.42)	(44.04)	(243.488)
YE	0.124***	0.065***	0.144***	0.121***
	(13.687)	(4.30)	(19.93)	(21.897)
LEV	0.029	-0.355***	-0.121***	0.047***
	(1.408)	(-10.04)	(-4.23)	(8.690)
Current	0.548***	-0.981***	0.049	0.466***
	(16.386)	(-20.97)	(0.68)	(33.313)
Quick ratio	-0.041***	0.006**	-0.032***	-0.034***
	(-14.129)	(2.19)	(-26.05)	(-33.995)
MG	-0.018***	0.053***	0.002	-0.020***
	(-2.890)	(8.18)	(0.43)	(-7.433)
SEG-count	0.010***	-0.001	0.010***	0.010***
	(21.592)	(-1.09)	(28.66)	(31.348)
GEO-count	0.014***	-0.018***	0.001	0.008***
	(4.648)	(-3.43)	(0.28)	(3.893)
Big4	0.330***	-0.047**	0.368***	0.386***
	(24.517)	(-2.51)	(47.43)	(52.900)
Going Concern	0.206***	-0.402***	-0.033	0.152***
	(5.399)	(-9.57)	(-0.97)	(13.521)
F-sales	0.226***	0.084***	0.303***	0.272***
	(21.632)	(5.03)	(35.06)	(42.410)
DAC	0.021	-0.028	0.018***	0.034***
	(1.344)	(-1.48)	(2.76)	(5.551)
ARTA	0.405***	0.503***	0.481***	0.200***
	(7.686)	(6.83)	(10.39)	(6.631)
INTA	-0.365***	0.303***	-0.173***	-0.427***
	(-6.073)	(3.64)	(-4.87)	(-14.572)
Constant	8.615***	-1.720***	7.804***	9.670***
	(59.272)	(-11.77)	(41.60)	(168.126)
Obs.	20,726	60,714	60,714	60,714
Adj. R-squared	0.827	0.141	0.847	0.808
Industry Dummy	YES	YES	YES	YES
Year Dummy	YES	YES	YES	NO

Note: This table reports the results of endogeneity tests (propensity score matching [PSM], Heckman, and Difference-in-Difference [DID]).Variable definitions are described in Appendix 3.1. Coefficient estimates are reported with *t*-statistics in parentheses. Statistical significance of the estimates is 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 Additional test – additional control variables

Other control variables may have a potential impact on the results reported in Table 3-4. Consequently, following prior literature (Menon and Williams 2001, Firth 2002, Fields et al. 2004, Asthana and Boone 2012, Beck et al. 2013, Jung et al. 2016, Mitra et al. 2019), I have now included four other control variables which are audit specialist (*SPEC*), audit tenure (*tenure*), current assets to current liabilities (*CR*), and market to book ratio (*MTB*)[21]. I then re-estimate Equation (3.1) with additional control variables and report the findings in Columns (1)-(4) of Table 3-5. The results remain the same after including additional control variables that the coefficient of the *M&A deals* variable is significantly positive. This supports the previous results in Table 3-4 that firms participating in M&As have higher audit fees.

[21] Definitions of those additional control variables are in Appendix 3.1. Their descriptive statistics are similar to previous research (Menon and Williams 2001, Firth 2002, Fields et al. 2004, Asthana and Boone 2012, Beck et al. 2013, Jung et al. 2016, Mitra et al. 2019). Approximately 10.5% of auditors in the sample are considered as audit specialists. The average tenure of auditor-client relationship is 1.648. The average value for the ratio of current assets to current liabilities is approximately 2.850, and that for market-to-book ratio is 2.733.

Table 3-6 M&A activities and audit fees – Additional control variables

	(1)	(2)	(3)	(4)
Dependent variable:	**Audit Fees**	**Change in Audit Fees**	**Audit Fees Ratio**	**Total Fees**
M&A deals	**0.016***	**0.039*****	**0.007*****	**0.036*****
	(1.913)	**(6.654)**	**(4.542)**	**(4.170)**
Loss	0.088***	-0.011	-0.008***	0.080***
	(7.189)	(-1.221)	(-3.711)	(6.316)
ROA	-0.296***	-0.034	-0.008	-0.309***
	(-8.940)	(-1.321)	(-1.559)	(-8.954)
SIZE	0.492***	-0.001	0.013***	0.519***
	(139.899)	(-0.264)	(22.295)	(144.641)
YE	0.120***	0.010	-0.009***	0.088***
	(13.760)	(1.641)	(-5.836)	(9.927)
LEV	0.062***	-0.023	0.004	0.056***
	(3.092)	(-1.547)	(1.107)	(2.810)
Current	0.434***	-0.068***	-0.009	0.420***
	(12.429)	(-2.897)	(-1.404)	(11.924)
Quick ratio	0.024	-0.008	0.001	0.035**
	(1.550)	(-0.781)	(0.198)	(2.260)
MG	-0.030***	0.097***	0.002	-0.014
	(-2.752)	(7.121)	(0.855)	(-1.347)
SEG-count	0.009***	-0.000	0.000***	0.010***
	(19.937)	(-0.241)	(2.634)	(20.803)
GEO-count	0.025***	0.000	0.001*	0.027***
	(8.423)	(0.020)	(1.654)	(8.945)
Big4	0.213***	0.054***	0.005*	0.218***
	(13.118)	(4.482)	(1.888)	(13.832)
Going Concern	0.114	0.027	0.003	0.066
	(1.411)	(0.577)	(0.274)	(0.795)
F-sales	0.268***	-0.007	0.003	0.254***
	(24.478)	(-0.956)	(1.326)	(22.546)
DAC	0.049***	-0.015	-0.000	0.043***
	(2.855)	(-0.981)	(-0.108)	(2.582)
ARTA	0.746***	0.033	-0.016*	0.645***
	(12.154)	(0.947)	(-1.749)	(10.148)
INTA	0.161*	-0.014	-0.031**	0.095
	(1.859)	(-0.240)	(-1.993)	(1.077)
SPEC	0.063***	0.004	0.002	0.076***
	(5.723)	(0.532)	(1.039)	(6.640)
tenure	-0.037***	0.009***	0.000	-0.037***
	(-9.074)	(3.119)	(0.235)	(-8.794)
CR	-0.059***	0.012	-0.000	-0.070***
	(-4.184)	(1.255)	(-0.172)	(-4.815)
MTB	-0.001*	0.001	0.000***	-0.000
	(-1.645)	(1.590)	(3.051)	(-0.352)
Constant	8.975***	0.088	0.942***	9.796***
	(82.341)	(1.385)	(68.742)	(88.331)
Obs.	17,541	17,082	16,449	17,541
Adj. R-squared	0.806	0.162	0.298	0.783
Industry Dummy	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES

Note: This table presents the regression results of audit fees and M&A deals with additional control variables. Coefficient estimates are reported with *t*-statistics in parentheses. Statistical significance of the estimates is 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 Additional test - time series of audit fees

I further investigate the time effect of audit fees one year before, during the current year, and one year after the M&D deal. The regression model (3.1) is re-estimated with dependent variables

being audit fees at the announcement year (t), one year before (t-1) and one year following merger announcement (t+1). It is found in Table 3-7 that the *M&A deals* variable is only positively significant for *Audit Fees*$_t$ and *Audit Fees*$_{t+1}$, but insignificant for *Audit Fees*$_{t-1}$. This provides evidence that acquiring firms experience significantly higher audit fees in the current and one year following M&A transactions, but not in the year prior to the M&A announcement year. These additional findings support the previous results that firms participating in M&As have higher audit fees.

Table 3-7 M&A activity and audit fees – additional test of time changes of audit fees

	(1)	(2)	(3)
Dependent variable:	**Audit Fees t**	**Audit Fees t+1**	**Audit Fees t-1**
M&A deals	**0.068*** **	**0.129*** **	**0.010**
	(10.906)	**(13.775)**	**(1.062)**
Loss	0.155***	0.082***	0.099***
	(27.111)	(9.833)	(11.313)
ROA	-0.074***	-0.092***	-0.093***
	(-22.535)	(-16.255)	(-14.017)
SIZE	0.473***	0.409***	0.405***
	(244.986)	(137.397)	(127.155)
YE	0.116***	0.094***	0.088***
	(20.972)	(11.696)	(10.211)
LEV	0.046***	0.046***	0.024**
	(8.515)	(4.802)	(2.224)
Current	0.469***	0.555***	0.368***
	(28.635)	(23.074)	(13.792)
Quick ratio	-0.035***	-0.031***	-0.031***
	(-30.713)	(-19.603)	(-16.939)
MG	-0.021***	0.018***	-0.014**
	(-7.702)	(4.814)	(-2.446)
SEG-count	0.010***	0.022***	0.011***
	(31.215)	(40.363)	(22.589)
GEO-count	0.008***	0.008***	-0.012***
	(3.755)	(2.914)	(-3.598)
Big4	0.384***	0.325***	0.347***
	(52.280)	(33.409)	(32.038)
Going Concern	0.153***	0.131***	0.234***
	(13.634)	(7.733)	(12.703)
F-sales	0.268***	0.167***	0.279***
	(41.844)	(17.745)	(29.704)
DAC	0.034***	0.044***	0.036***
	(5.568)	(4.797)	(3.265)
ARTA	0.256***	0.010	0.272***
	(9.044)	(0.239)	(6.014)
INTA	-0.312***	-0.491***	-0.289***
	(-11.256)	(-12.053)	(-6.307)
Constant	8.872***	9.301***	10.223***
	(157.566)	(106.480)	(113.140)
Obs.	60,714	60,713	60,714
Adj. R-squared	0.847	0.666	0.631
Industry Dummy	YES	YES	YES
Year Dummy	YES	YES	YES

Note: This table presents the regression results of audit fees and M&A deals during time changes. Variable definitions are described in Appendix A. Coefficient estimates are reported with *t*-statistics in parentheses. Statistical significance of the estimates is 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.

3.4.5 M&A activities and audit pricing – moderation effect of fiancial restatements

The first hypothesis (H1) examines the moderation effect of financial restatements on the relationship of M&A activities and audit fees. The regression results of model 3.2 are shown in Column (1) of Table 3-8. The coefficients of the *M&A deals, RES* and *M&A deals*RES* variables are all significantly positive (at $p<0.01$). These findings support H1 that M&A firms with financial restatements are more likely to have higher audit fees. The estimated coefficients of the control variables are generally consistent with those found in prior literature (Firth 2002, Fields et al. 2004, Gotti et al. 2012, Bentley et al. 2013, Alexeyeva and Svanström 2015, Mitra et al. 2019, Habib et al. 2020). For example, I find that larger firms with higher net operating losses, higher current assets to total assets, more going concern opinions, Big4 auditors, higher numbers of business/geographical segments, and their financial year ending in December, incur higher audit fees (at $p \leq 0.10$).

I further investigate the restatement severity by type of restatement. I follow previous literature (Palmrose and Scholz 2004, Hennes et al. 2008, Armstrong et al. 2010, Paterson and Valencia 2011, Hennes et al. 2014, Paik et al. 2018, Habib et al. 2020) to differentiate restatement severity by separating it into different types. These include restatements occurring for: accounting rule application failures (*ACC_RES*); adverse effect on financial statement (*ADV_RES*); improved effect on financial statement (*IMPR_RES*); misstated SEC filings (*SEC_RES*); financial fraud, improper revenue recognition and irregularities (*FRAUD_RES*); errors in accounting and clerical application (*CLER_RES*); and other significant issues noted (*OTHER_RES*). All types of restatements are defined in Appendix 3.1[22]. I re-estimate Equation 3.2 with different types of restatements and the results are shown in Column (2)-(8) of Table 3-8. It is found that the coefficients of the interaction term between M&A deals and the type of accounting restatements is significantly positive (at $p<0.05$) only for accounting restatement (*M&A deals*ACC_RES*), adverse restatement (*M&A deals*ADV_RES*), and (at $p<0.05$) for clerical applications restatements (M&A deals*CLER_RES). The results indicate that firms engaging in M&A deals and receiving accounting restatements, or adverse restatements (financial statement materiality), or clerical applications restatements (misrepresentations) incur higher audit fees. In the sample, the interaction term of M&A deals with all other type of restatements (i.e. financial fraud restatements, SEC restatements, restatements relating to improved effect on financial statements, and other restatements) is not significant, suggesting that firms engaging in M&A activities and receiving any kind of these restatements do not incur higher audit fees.

[22] The number of observations for all the types of restatements used in this study is 6,947 for *ACC_RES*; 6,120 for *ADV_RES*; 145 for *FRAUD_RES*; 1,181 for *IMPR_RES*; 744 for *OTHER_RES*; 439 for *SEC_RES*; and 297 for *CLER_RES*.

Table 3-8 M&A activities and audit fees – interaction effect of restatements

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:					**Audit Fees**			
M&A deals	0.063***	0.064***	0.064***	0.067***	0.067***	0.067***	0.068***	0.068***
	(9.913)	(10.161)	(10.181)	(10.750)	(10.857)	(10.724)	(10.973)	(10.887)
RES	0.126***							
	(11.252)							
M&A deals×RES	**0.067*** **							
	(2.799)							
ACC_RES		0.127***						
		(11.007)						
M&A deals× ACC_RES		**0.052** **						
		(2.125)						
ADV_RES			0.118***					
			(9.511)					
M&A deals× ADV_RES			**0.067** **					
			(2.556)					
CLER_RES				0.124***				
				(2.689)				
M&A deals× CLER_RES				**0.242*** **				
				(2.649)				
FRAUD_RES					0.328***			
					(3.516)			
M&A deals× FRAUD_RES					**0.241**			
					(1.242)			
IMPR_RES						0.142***		
						(5.825)		
M&A deals× IMPR_RES						**0.059**		
						(1.022)		
OTHER_RES							0.288***	
							(8.818)	
M&A deals* OTHER_RES							**0.036**	
							(0.518)	
SEC_RES								0.208***
								(3.952)
M&A deals× SEC_RES								**0.068**
								(0.759)
Loss	0.151***	0.151***	0.152***	0.154***	0.154***	0.154***	0.152***	0.154***
	(26.532)	(26.568)	(26.666)	(27.059)	(27.055)	(26.998)	(26.765)	(26.998)
ROA	-0.074***	-0.074***	-0.075***	-0.075***	-0.074***	-0.074***	-0.075***	-0.074***
	(-22.510)	(-22.501)	(-22.535)	(-22.548)	(-22.534)	(-22.506)	(-22.562)	(-22.536)
SIZE	0.473***	0.473***	0.473***	0.473***	0.473***	0.473***	0.473***	0.473***
	(245.396)	(245.381)	(245.240)	(245.011)	(244.890)	(245.135)	(245.134)	(245.080)
YE	0.116***	0.116***	0.116***	0.116***	0.116***	0.116***	0.116***	0.116***
	(21.047)	(21.035)	(21.029)	(20.975)	(20.979)	(20.988)	(20.913)	(21.009)
LEV	0.046***	0.046***	0.046***	0.046***	0.046***	0.046***	0.047***	0.046***
	(8.509)	(8.503)	(8.472)	(8.521)	(8.539)	(8.560)	(8.575)	(8.530)
Current	0.476***	0.475***	0.474***	0.469***	0.469***	0.470***	0.470***	0.470***
	(29.076)	(29.056)	(28.978)	(28.649)	(28.648)	(28.718)	(28.725)	(28.680)
Quick ratio	-0.035***	-0.035***	-0.035***	-0.035***	-0.035***	-0.035***	-0.035***	-0.035***
	(-30.752)	(-30.767)	(-30.748)	(-30.696)	(-30.701)	(-30.712)	(-30.758)	(-30.677)
MG	-0.022***	-0.022***	-0.021***	-0.021***	-0.021***	-0.021***	-0.021***	-0.021***
	(-7.861)	(-7.869)	(-7.805)	(-7.690)	(-7.671)	(-7.757)	(-7.717)	(-7.729)

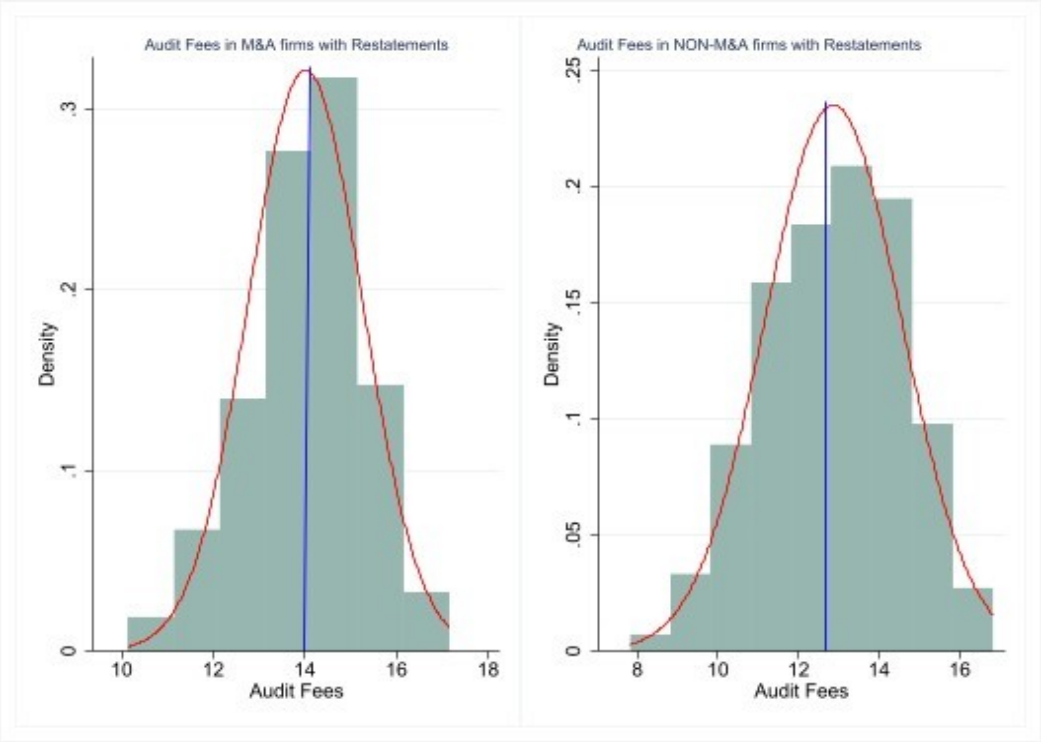
Table 3-8 (continued)

SEG-count	0.010***	0.010***	0.010***	0.010***	0.010***	0.010***	0.010***	0.010***
	(31.109)	(31.106)	(31.102)	(31.217)	(31.230)	(31.232)	(31.223)	(31.239)
GEO-count	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***	0.008***
	(3.871)	(3.865)	(3.837)	(3.774)	(3.729)	(3.786)	(3.734)	(3.739)
Big4	0.384***	0.384***	0.384***	0.384***	0.384***	0.384***	0.384***	0.385***
	(52.391)	(52.367)	(52.363)	(52.318)	(52.286)	(52.304)	(52.353)	(52.399)
Going Concern	0.150***	0.150***	0.150***	0.153***	0.152***	0.153***	0.152***	0.152***
	(13.372)	(13.361)	(13.396)	(13.653)	(13.611)	(13.623)	(13.596)	(13.567)
F-sales	0.267***	0.267***	0.267***	0.268***	0.268***	0.268***	0.268***	0.268***
	(41.776)	(41.766)	(41.787)	(41.838)	(41.867)	(41.834)	(41.798)	(41.850)
DAC	0.036***	0.036***	0.036***	0.034***	0.034***	0.034***	0.035***	0.034***
	(5.811)	(5.795)	(5.799)	(5.587)	(5.602)	(5.564)	(5.665)	(5.587)
	0.253***	0.253***	0.253***	0.257***	0.255***	0.256***	0.254***	0.256***
	(8.939)	(8.936)	(8.946)	(9.071)	(8.979)	(9.045)	(8.962)	(9.026)
	-0.314***	-0.314***	-0.313***	-0.312***	-0.312***	-0.312***	-0.315***	-0.311***
	(-11.320)	(-11.320)	(-11.309)	(-11.261)	(-11.266)	(-11.265)	(-11.357)	(-11.238)
Constant	8.868***	8.869***	8.869***	8.871***	8.873***	8.871***	8.875***	8.871***
	(158.280)	(158.318)	(157.955)	(157.512)	(157.582)	(157.902)	(157.868)	(157.786)
Obs.	60,714	60,714	60,714	60,714	60,714	60,714	60,714	60,714
Adj. R-squared	0.847	0.847	0.847	0.847	0.847	0.847	0.847	0.847
Industry Dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES	YES	YES

Note: This table presents the regression results of audit fees and the interaction of M&A deals and restatements. Variable definitions are described in Appendix 3.1. Coefficient estimates are reported with t-statistics in parentheses. Statistical significance of the estimates is 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.

Figure 3-2 visually shows audit fees in M&A firms with restatements versus audit fees in non-M&A firms with restatements. The histograms show their normal density is differentiated, with an average value of audit fees (as the natural logarithm) in M&A firms with restatements being 14.01 (equivalent to $1,214,691), and that in non-M&A firms with restatements being 12.86, which is equivalent to $384,616. The visual evidence supports the argument that M&A firms with financial restatements are more likely to have higher audit fees (H1) compared with their counterparts.

Figure 3-2 Audit fees and financial restatements – M&A firms vs non-M&A firms



3.4.6 Cross-sectional anaylses

This study conducts cross-sectional tests to examine the channels that could moderate the relationship between M&A deals and audit fees in the presence of financial restatements in the second hypothesis (H2). The channels comprise strength of the internal control material weakness (ICMW) restructures, level of audit quality (Big4 audit firms), geographical location of audit offices and agency effects.

3.4.6.1 Strength of the internal control material weakness (ICMW) restructures

To investigate the impact of ICMW on the relationship between audit fees and M&A deals in the presence of financial restatements, I split the sample into two subsamples: firms with an ICMW and firms without an ICMW during the year in which an M&A transaction occurred. Columns (1) and (2) of Table 3-9 show that the coefficient of the interaction variable between M&A deals and restatements (*M&A deals*RES*) is significantly positive for firms that received an ICMW record during the M&A year (at p<0.01). However, it is not significant for firms that did not receive an ICMW record during the M&A transaction year. The finding indicates that M&A firms that had financial restatements and recorded an ICMW incur higher audit fees compared with their counterparts. The existence of ICMWs suggests a lack of managerial experience and demonstrates that firms have fewer effective internal controls (Feng et al. 2009, Caplan et al. 2018), thereby contributing to a greater risk of choosing improper accounting practices when participating in M&As.

Insufficient internal controls increase the chance of errors or omissions occurring deliberately or accidentally, requiring higher audit work and increasing audit risk, resulting in higher audit fees.

3.4.6.2 Level of audit quality (Big4 audit firms)

To examine the impact of Big4 audit firms on the relationship between audit fees and M&A deals in the presence of financial restatements, I split the sample into two subsamples: firms with Big4 auditors and firms without Big4 auditors. The regression results are presented in Columns (3) and (4) of Table 3-9. The coefficient of the interaction variable *M&A deals*RES* is significantly positive for firms that use non-Big4 audit firms (at $p<0.01$) but is not significant for firms that employ Big4 audit firms. The findings indicate that, in the presence of financial restatements, M&A firms that use non-Big4 audit firms incur higher audit fees than those using Big4 audit firms. This results are consistent with prior literature in that clients of Big4 audit firms are less likely to issue accounting restatements and are provided with audits of a higher quality than clients of non-Big4 audit firms (Eshleman and Guo 2014).

3.4.6.3 Geographical location of audit firms

To investigate the effect of the geographical location of audit-client offices on the relationship between audit fees and M&A deals in the presence of restatements, I divide the sample into two subsamples of the same and different states, depending on the location of auditor-client offices. The regression results are presented in Columns (5) and (6) of Table 3-9. It can be seen that the coefficient of the interaction variable, *M&A deals*RES,* is significantly positive (at $p<0.05$) for firms located in a state different from that of their auditors. However, this coefficient is not statistically significant for firms located in the same state as the auditor. The findings indicate that, in the presence of financial restatements, M&A firms located in states different from those of their auditors incur more audit fees than those located in the same state. This may relate to the fact that auditors in the same state as their clients would be able to establish personal and social links with clients, which could reduce auditor autonomy and increase the auditor's economic reliance on close clients by strengthening auditor-customer relations. In addition, clients and auditors located in the same state would limit misreporting asymmetrically between groups. Under this perspective, auditors and clients in different states will be less inclined to curtail any misreporting, and that could contribute to a higher incidence of financial restatements.

3.4.6.4 Agency factors

To investigate the effect of the agency cost of cash holdings on the relationship between audit fees and M&A deals in the presence of restatements, I split the sample into high and low cash-holding

subsamples based on the above-median and below-median cash levels. The regression analyses of the two subsamples are reported in Columns (7) and (8) of Table 3-9. The coefficient of the interaction variable between M&A deals and restatements is significantly positive for firms with high levels of cash-holding (at $p<0.05$), but not significant for firms with low levels of cash-holding. The findings indicate that acquiring firms with both high levels of cash-holding and financial restatements incur higher audit fees than those with low levels of cash-holding. Audit fees are increased in acquiring firms in the presence of financial restatements and high agency costs.

Table 3-9 M&A activities and audit fees in the presence of restatements – Moderating effect of material weaknesses, size of audit firms, geographical location, and agency costs

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	**Audit Fees**							
	Material Weaknesses		**Size of Audit Firms**		**Geographical Location**		**Agency Costs**	
	ICMW=1	**ICMW=0**	**Big4**	**Non-Big4**	**Same state**	**Different state**	**High Cash-Holding**	**Low Cash-Holding**
M&A deals	0.005	0.080***	0.064***	0.067***	0.047***	0.108***	0.059***	0.069***
	(0.144)	(11.431)	(9.315)	(4.293)	(6.711)	(7.568)	(6.321)	(7.822)
RES	0.056*	0.074***	0.172***	0.057***	0.146***	0.075***	0.059***	0.069***
	(1.947)	(5.483)	(12.799)	(2.995)	(11.527)	(3.389)	(6.321)	(7.822)
M&A deals×RES	**0.179*****	**-0.007**	**0.008**	**0.159*****	**0.042**	**0.131****	**0.071****	**0.039**
	(2.751)	**(-0.269)**	**(0.291)**	**(2.899)**	**(1.604)**	**(2.250)**	**(2.088)**	**(1.197)**
Constant	9.707***	9.957***	9.109***	9.090***	8.799***	9.071***	8.885***	8.885***
	(24.119)	(165.541)	(123.266)	(117.509)	(127.498)	(99.078)	(95.485)	(132.406)
Obs.	4,879	34,900	40,191	20,523	43,949	16,765	30,017	29,017
Adj. R-squared	0.849	0.856	0.802	0.718	0.844	0.845	0.834	0.849
Other controls	YES	YES	YES	YES	YES	YES	YES	YES
Industry Dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES	YES	YES

Note: This table reports the moderation effect of material weaknesses, size of audit firms, geographical location and agency costs. Variable definitions are described in Appendix 3.1. Coefficient estimates are reported with *t*-statistics in parentheses. Statistical significance of the estimates is 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.

3.4.6.5 Additional proxies for geographical location and agency costs

In this section, I employ a number of different measures of agency costs and the geographical location of audit firms, to check the robustness of the results presented in Table 3-9.

3.4.6.5.1 Same and different city as the additional proxy for geographical location

A former SEC Commissioner Wallman (1996) stressed that auditing research should concentrate more on city-level studies rather than on national-level analyses, because local auditing offices make decisions with respect to a specific client. I, thus, employ locations (same and different cities) between client and auditor as an additional proxy for geographical location. The regression results for these two subsamples are reported in Columns (1) and (2) of Table 3-10. The coefficient of the interaction variable *M&A deals*RES* remains significantly positive (at $p<0.10$) for firms located in a city different from that of their auditors but is not significant for firms located in the same city as their auditors. This result indicates that acquiring firms in a city different from their auditors will, in the presence of restatements, incur higher audit fees than those located in the same city as their auditors.

3.4.6.5.2 Other measures of agency costs

CEO compensation will signal issues relating to agency effects, since firm management can have enhanced compensation at the expense of shareholders (Bebchuk and Fried 2003, Jiraporn et al. 2005). As the wealth of CEOs is also vulnerable to short-term stock prices (Cheng and Warfield 2005), CEOs can engage in earnings management in order to increase the short-term stock price and their personal wealth, which can lead to more financial restatements (Cheng and Farber 2008).

Board members are responsible for monitoring firms and their agents (Jensen and Meckling 1976). In public companies with separate ownership and management, management can be both inclined and able to take advantages in their own interests, to the detriment of the needs of shareholders. The board has the right to assign firm capital on behalf of shareholders (the principal) (Crespí–Cladera and Gispert 2003). García-Meca and Sánchez-Ballesta (2009) indicate that the size of the board has a negative impact on earnings control. Moreover, large boards suffer higher costs of cooperation, and build problems of self-governing operators and wasteful decisions that limit board-monitoring effectiveness (Lipton and Lorsch 1992). These could, consequently, give company management the ability to indulge in financial misreporting, which would later be evidenced by a greater restatement rate (Habib et al. 2020).

Following previous literature, I use different measures of agency costs, such as CEO compensation, board compensation and board size, for robust checks of the results presented in Table

3-9. For each additional measure of agency costs, I split the sample into the subsamples of low and high, based on the median value, and present the regression results in Columns (3)-(8) of Table 3-10. The positive relationship between audit fees and M&A deals in the presence of financial restatements is stronger in firms with higher agency costs (i.e. high CEO compensation, high board compensation, and large board size) at $p<0.10$. The interaction variable *M&A deals*RES* is significantly positive in the high-agency-cost subsample, but not in the low-agency-cost subsample. These findings indicate that the main results in Columns (7) and (8) of Table 3-9 are robust across different measures of agency costs.

Table 3-10 M&A activities and audit fees in the presence of restatements – Additional proxies for geographical location, and agency costs

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	**Audit Fees**							
	Geographical Location		**Agency Costs**					
	Same city	**Different city**	**High CEO Compensation**	**Low CEO Compensation**	**High Board Compensation**	**Low Board Compensation**	**High Board Size**	**Low Board Size**
M&A deals	0.071***	0.055***	0.081***	0.006	0.060***	0.065***	0.067***	0.062***
	(6.218)	(7.293)	(10.727)	(0.483)	(7.973)	(5.630)	(7.893)	(5.158)
RES	0.132***	0.124***	0.121***	0.154***	0.128***	0.112***	0.107***	0.167***
	(6.162)	(9.425)	(9.628)	(5.392)	(9.991)	(4.820)	(7.094)	(8.452)
M&A deals×RES	**0.040**	**0.050***	**0.071****	**-0.001**	**0.073*****	**0.059**	**0.115*****	**-0.009**
	(0.975)	**(1.810)**	**(2.492)**	**(-0.011)**	**(2.607)**	**(1.285)**	**(3.652)**	**(-0.204)**
Constant	8.666***	8.566***	8.891***	8.620***	8.856***	8.933***	8.939***	8.585***
	(73.676)	(169.332)	(140.189)	(46.971)	(138.841)	(83.277)	(120.395)	(82.229)
Obs.	17,008	43,706	48,122	9,203	46477	14237	35,165	17,751
Adj. R-squared	0.834	0.842	0.851	0.732	0.839	0.863	0.862	0.795
Other controls	YES	YES	YES	YES	YES	YES	YES	YES
Industry Dummy	YES	YES	YES	YES	YES	YES	YES	YES
Year Dummy	YES	YES	YES	YES	YES	YES	YES	YES

This table reports additional analysis for the moderation effect of geographical location and agency costs. Variable definitions are described in Appendix 3.1. Coefficient estimates are reported with *t*-statistics in parentheses. Statistical significance of the estimates is 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 Conclusion

This study examines the relationship between audit fees and the occurrence of M&A deals. Firms that participate in M&A transactions incur higher audit fees. This study finds these firms did not incur high audit fees one year prior to participating in M&A transactions, but they experienced increased audit fees in the year of, and one year following, takeover announcements. Acquiring firms that have financial restatements are found to incur higher audit fees. Furthermore, acquiring firms with specific types of restatement, such as, restatements related to accounting rule application failures, restatements that have adverse effects on a firm's financial statement (financial statement materiality), or restatements related to errors in accounting and clerical applications, are charged higher audit fees. This study explores four channels that could potentially affect the relationship of M&As, restatements and audit fees, namely, strength of the internal control material weaknesses (ICMW) restructures, the level of audit quality (Big4 or non-Big4 auditors), geographic location of audit offices, and agency effects. I find that the positive association between audit fees and acquiring firms having restatements, is further increased in firms with reported ICMWs, and in firms that employ non-Big4 audit firms. This study uses two measures of geographic location for client and auditor (i.e., same and different state, same and different city), and find that the positive relationship between acquiring firms having restatements with audit fees is further increased when firms have a geographic location different from that of their auditors. Moreover, I use a number of measures of agency costs (i.e. high cash holdings, high CEO compensation, high board compensation, and large board size) to provide a complete picture of the influence of agency costs on the effect of M&A and restatements on audit fees. The finding of this study indicates that this positive relationship is further increased in firms with high agency costs. This study provides more insights into the factors that affect the strength of the relationship between audit fees and acquiring firms having restatements.

3.6 Appendices

Appendix 3.1 Definition of Variables

Variable	Definition
Dependent variables: Audit pricing	
Audit Fees	The natural logarithm of audit fees.
Additional proxies of audit fees	
Change Audit Fees	The difference in values of audit fees between the ''current'' year and the preceding year.
Audit Fees Ratio	The ratio of non-audit fees to audit fees.
Total Fees	The natural logarithm of the total fees (audit and non-audit fees).
Audit Fees$_{t-1}$	The natural logarithm of audit fees one year before M&A transaction occurs.
Audit Fees$_{t+1}$	The natural logarithm of audit fees one year after M&A transaction occurs.
Independent variables	
M&A deals	A dummy variable set to one if the firm had any M&A activity during year *t*; zero otherwise.
RES	A dummy variable taking the value one if the company recorded a financial restatement during the year; zero otherwise
Different type of restatements	
ACC_RES	The restatement identified as accounting rule application (GAAP/FASB) failures.
ADV_RES	The restatement identified as having an adverse effect on financial statement.
FRAUD_RES	The restatement identified as financial fraud, irregularities and misrepresentations.
IMPR_RES	The restatement identified as having an improved effect on financial statement.
OTHER_RES	The restatement is related to other significant issues.
SEC_RES	The restatement identified as having SEC involvement in the restatement process.
CLER_RES	The restatement is related to errors in accounting and clerical applications.
Control variables	
SIZE	Firm size, measured as the natural logarithm of total assets at the beginning of the year.
Loss	A dummy variable taking the value one if net profit is less than zero; zero otherwise.
LEV	Firm leverage, measured as long-term and short-term debt divided by total assets.
YE	A dummy variable coded one if the accounting year-end is December; zero otherwise (Chan et al. 1993).
ROA	Return on assets, measured as the pre-tax income minus extraordinary items scaled by total assets.
Current	The ratio of current assets to total assets
Quick ratio	The ratio of current assets less inventories and prepaid expenses scaled by current liabilities.
MG	Changes in sales from previous year.
SEG-count	The square root of the number of business segments (Menon and Williams 2001).
GEO-count	The square root of the number of geographical segments.
Big4	A binary indicator equal to one if the firm is audited by Big4 auditing firms (i.e. Deloitte & Touche, Ernst & Young, KPMG, or PricewaterhouseCoopers), zero otherwise
Going Concern	A binary indicator equal to one if audit opinion modified for going concern, zero otherwise.

Variable	Definition
F-sales	Foreign sales, measured as a dummy variable taking the value one if foreign sale of company is positive; zero otherwise.
DAC	I calculate discretionary accruals as the residual of the model below (Jones 1991): $\mathrm{TA}_t / A_{t-1} = \beta_0 + \beta_1(1/A_{t-1}) + \beta_2((\Delta\mathrm{REV}_t - \Delta\mathrm{REC}_t)/A_{t-1}) + \beta_3(\mathrm{PPE}_t / A_{t-1}) + \beta_4 ROA_t + +\varepsilon_t$ where: TA_t = Total accruals calculated as net income minus cash flows from operations; A_{t-1} = Beginning balance of total assets; ΔREV_t = Changes in revenue; ΔREC_t = Changes in accounts receivable; and PPE_t = Gross property, plant and equipment minus land and assets under construction.
ARTA	Account receivable divided by total assets.
INTA	Inventory scaled by total assets.
SPEC	Audit specialist, measure as a dummy variable set to one if auditor holds more than 10% market share than its closest competitor in a given year industry, otherwise set for zero.
tenure	Total years of the auditor-client relationship, expressed in natural logarithm.
CR	The ratio of current assets to current liabilities.
MTB	The market-to-book ratio, measure as the ratio of market value of equity to book value of equity.
Proxy of internal control material weaknesses	
ICMW	A binary indicator equal to one if material weakness is found in the firm internal control, zero otherwise.
Proxies of agency costs	
High/Low Cash holding	Cash and short-term investments divided by sales. High or low cash-holding is ranked as above or below the median of the sample.
High/Low CEO compensation	The natural logarithm of the total CEO compensation minus salary. High or low CEO compensation is ranked as above or below the median of the sample.
High/Low board compensation	The natural logarithm of the total board compensation minus salary. High or low board compensation is ranked as above or below the median of the sample.
High/Low board size	The number of directors on the board of directors. High or low board size is ranked as above or below the median of the sample.
Proxy of geographical location	
Same State	A dummy variable equal to one if firms are in the same state as their auditors; zero otherwise.
Different State	A dummy variable equal to one if firms are located in states different from their auditors; zero otherwise.
Same City	A dummy variable equal to one if firms are in the same city as their auditors; zero otherwise.
Different City	A dummy variable equal to one if firms are in a city different from their auditors; zero otherwise.

Chapter Four

4

The influence of firm life cycle on the asymmetric cost behaviour of U.S. acquiring firms

4.1 Introduction

Measuring performance and reporting operational results to stakeholders begins with measuring costs and revenues (Cooper and Kaplan 1992, Noreen and Soderstrom 1994). Recent research recognises how resources change costs, and how managers' optimism about future sales affect their decisions to retain, or to free up, slack resources (Anderson et al. 2003, Anderson et al. 2007, Banker and Byzalov 2014). Anderson et al. (2003) contrasts the standard model of cost behaviour where costs shift proportionately with changes in the level of operations, with an alternative model based on the assumption that sticky selling, general and administrative (SG&A) costs result from managements' resource allocation to activities when revenues decrease. They classify costs as sticky if the magnitude of cost increases associated with a given volume increase in revenue is greater than the magnitude of cost decreases associated with the same volume decrease in revenue. With respect to concurrent sales, or other cost drivers, traditional cost behaviour categorises all costs as either fixed or variable (Anderson et al. 2003, Banker et al. 2014). However, the relationship between costs and cost drivers can be complicated, as some costs grow faster with increased activities than they fall with proportionately lower activity levels (Cooper and Kaplan 1998).

Prior literature (Grinstein and Hribar 2004, Bugeja et al. 2012) shows that firms participating in merger and acquisition (M&A) activities face different constraints to firms not involved in M&As. Given that M&A deals are one of a firms' largest investments, high levels of adjustment costs, such as installation and disposal costs for fixed assets or hiring and firing costs, translate to greater cost stickiness (Bentolila and Bertola 1990, Cooper and Haltiwanger 2006), and are likely to have a significant impact on M&A performance (Jang and Yehuda 2020). Adjustment costs are anticipated to play a key part in generating merger profits and synergies as M&A activities are one of the biggest investment decisions made by companies (Jang and Yehuda 2020). Furthermore, the market for corporate control may have different consequences for different acquirers with sticky costs (Uğurlu et al. 2019). According to Alexandridis et al. (2010), market competition is a significant external force influencing business behaviour, with outcomes, such as increased premium payments to target firms, and lower acquirer profits. In this regard, the acquirer's cost stickiness may limit its resource adjustment flexibility, making post-integration more challenging and lowering acquirer returns (Uğurlu et al. 2019). Hence, this study investigates whether there is any difference in the asymmetric cost behaviour between M&A firms and non-M&A firms. Moreover, cost stickiness is an important cost management concept that can be linked to firm life cycle (Habib and Hasan 2019), since firms tend to have different costing strategies over different stages of their development. Therefore, I examine if the cost stickiness behaviour of acquiring firms varies across different stages of life cycle development.

Using a large sample of firms involved in M&A activities over the period of 1990–2019, this

study finds that M&A firms have lower levels of cost stickiness compared with non-M&A firms. The baseline result is further confirmed by propensity score matching (PSM), the generalised method of moments (GMM), and a difference-in-difference (DID) test, all of which mitigate endogeneity concerns that could relate to omitted variable bias, autocorrelation and heteroscedasticity, model misspecification, or reverse causality. Furthermore, the results indicate that the cost stickiness behaviour of acquiring firms is different across the five stages of a corporate life cycle as delineated by Dickinson (2011). Although acquiring firms in the introduction and decline stages have higher levels of cost stickiness, anti-stickiness cost behaviour is found for acquirers in the growth, maturity and shakeout stages. The results are robust to a different measure of firm life cycle as classified in DeAngelo et al. (2006).

This study also explores two channels: level of capital expenditure (*CAPEX);* level of research and development (*R&D*) expenses, that potentially affect the cost stickiness behaviour of acquiring firms across their firm life cycle. I find that the high level of cost stickiness is observed only for acquiring firms with low *CAPEX* in the introduction stage. It is still prevalent in the decline stage, regardless of *CAPEX* levels. In contrast, the anti-stickiness cost behaviour is found only for acquirers with low *CAPEX* in the maturity stage, but is consistent in the growth stage for all acquirers, irrespective of *CAPEX* levels. Similar results are also found for the moderating effect of *R&D* expenses. Although the high level of cost stickiness is observed only for acquiring firms with high *R&D* expenses in the introduction stage, it is no different for acquirers with various levels of *R&D* expenses in the decline stage. The anti-stickiness cost behaviour is observed for acquiring firms with high levels of *R&D* expenses in the maturity stage, but this distinction dissipates for acquirers in the growth stage.

This study contributes to the literature in a number of ways. First, to the best of my knowledge, this study is the first to show that firms engaging in M&A activities have lower levels of cost stickiness behaviour than firms not engaging in M&As. I answer the call from Anderson et al. (2016) to investigate cost behaviour under different circumstances, such as those pertaining to M&A activities. Previous literature shows that the asymmetric cost behaviour varies across different business strategies (Ballas et al. 2020). This study adds to the literature by documenting that this behaviour is also different in firms participating in M&A activities compared to those not participating. Second, this study investigates the cost stickiness behaviour of acquiring firms over their life cycle stages, based on the Dickinson (2011) and DeAngelo et al. (2006) models. This study demonstrates that acquiring firms in the introduction and decline stages exhibit higher levels of cost stickiness behaviour, but they have anti-stickiness cost behaviour in the growth, mature and decline stages. In doing so, I answer the call from (Habib and Hasan 2019) by investigating how the cost stickiness of acquirers changes across life cycle development. Third, this study contributes to the

literature on firm cost behaviour, M&As, and corporate life cycle development, by investigating two channels that can potentially affect acquiring firms' cost stickiness behaviour across different stages of the firm life cycle. High and low capital expenditures, and high and low R&D expenses are investigated as potential channels that might affect this relationship. In doing so, this study provides a more nuanced examination of the mechanisms that could increase the level of cost stickiness in firms that engage in M&A activities across firm life cycle stages.

The rest of this chapter is structured as follows. Section 4.2 reviews the literature and develops the hypotheses. The sample selection and regression model are discussed in Section 4.3. The empirical results, robustness checks and cross-sectional tests are presented and discussed in Section 4.4. Finally, Section 4.5 concludes the study.

4.2 Literature review and hypothesis development

4.2.1 Cost stickiness and M&As

Cost stickiness is a term that describes asymmetric cost behaviour. Consistent with prior literature, the corresponding of SG&A costs is analysed in conjunction with the level of sales (revenue), as the amount of sales determines many of SG&A's expenses (Cooper and Kaplan 1991). When sales demand grows, management expands SG&A expenses to such an extent that more revenue can be accommodated. However, as sales volume decreases, certain SG&A expenses are not removed until decided upon by management (Calleja et al. 2006). The SG&A costs get sticky if management do not plan to modify costs whilst maintaining unused capital as sales volume decreases. Managers calculate expected transition costs by evaluating the volatility of upward and downward changes in demand, as well as their projections of the costs of eliminating and then replacing dedicated resources (Anderson et al. 2003). When managers estimate the costs of scaling down and then scaling up again as being more permanent, planned adjustment costs decline. Less-sticky acquiring firms have more capital adjustment versatility, achieve higher abnormal returns, and buy more intangible-intensive targets (Jang and Yehuda 2020). Prior research shows that acquiring firms appear to suffer large losses, and lose more value, when making takeover announcements (Alexandridis et al. 2012). Furthermore, managerial anticipation of potential demand for the firm's products, increases the degree of cost stickiness (Banker et al. 2014). As the adjustment costs of acquirers are greater, their versatility with respect to cutting resources is lower.

In situations when managers are under pressure to hit a specific revenue target, they are more prone to participate in myopic real revenue management, cutting slack resources disproportionately when sales decline, and delaying the purchase of new resources when sales improve (Dierynck et al. 2012, Kama and Weiss 2013). As a result, cost stickiness will be reduced below an efficient level (Banker et al. 2014). As long as future savings surpass present losses, managers will forgo current

period earnings to maintain an appropriate degree of slack in order to prevent future adjustment costs (Banker et al. 2014). Excessive resource cuts may boost short-term financial performance, but they deplete long-term value by causing an inefficiently significant increase in future adjustment costs (Banker et al. 2014), which may lead to cost stickiness.

Based on the theory of economic behaviour, asymmetric cost behaviour is the product of managers' prudent decisions to avoid resource adjustment costs, whereby managers do not react adequately to short-term income reductions in order to control long-term re-financing costs (Banker et al. 2008). Stickier cost behaviour is associated with higher costs of adjusting resources (such as higher levels of assets, capital expenditures, or staff levels) or where there is greater uncertainty with managements' decision-making, such as volatility in revenue or returns (Venieris et al. 2015). Optimistic managers will maximise capacity of resources when conditions of demand change, but will reduce the capacity when demand declines (Banker et al. 2008). Firms respond to environmental changes that affect their operating risk by making appropriate economic decisions such as adjusting their cost structures through resource acquisition decisions (Holzhacker et al. 2015). M&A transactions constitute major investments, adjustment costs, such as installation and disposal expenses for fixed assets, or hiring and firing, which are likely to have a substantial impact on M&A success (Jang and Yehuda 2020). Eberly and Mieghem (1997) investigate the optimum resource capability adjustment, and find that the greater the projected demand, the more confident the managers are about their resource acquisition decisions.

Physical capital is added and removed naturally in the life of a firm as a result of M&A transactions (Anderson et al. 2016). When a company adds additional physical capital or expands its capacity, administrative and overhead costs are certainly going to increase. With the addition of new physical capital, Lee (2018) argues that the operating resource commitments grow in two ways: through resource commitments that are tied directly to that investment (e.g. plant overhead for a manufacturing facility) and through commitments that are organisation-wide (e.g. sales administration). It is likely that cost inertia will occur with the latter type of resource commitment since such resources will not be naturally disregarded upon closure of a facility, but they can be easily repurposed in ways that may include the construction of new physical capital (Anderson et al. 2016). There are several options for companies when demand increases owing to M&A transactions. Firms can use existing employees by offering bonuses for working overtime, or they can hire more part-time employees if managers believe the demand will continue to increase in the near future. Conversely, when demand decreases, firms may lower payments to full-time employees (e.g. reducing overtime or incentive pay), or layoff full-time employees (Anderson et al. 2016). Firms with high demand volatility such as those engaged in M&A transactions are more likely to optimise plans for adding and discharging employee resources designed to adjust costs (Anderson et al. 2016).

Adjustment costs are likely to be the motivation for resource redeployment. For instance, non-diversified acquisitions can help produce value by allowing asset redeployment and value transfers (Jang and Yehuda 2020). Healy et al. (1992) find that the post-acquisition operating performance of merged firms outperforms that of their industry peers in terms of asset productivity, and creates higher future operating cash flows. M&A transactions commonly result in significant resource realignment between acquirers and targets (Capron et al. 1998), and acquiring firms are found not to reduce their long-term investments (Jang and Yehuda 2020). It is evidenced in the literature that the diversification of the acquired plant increases production (Schoar 2002), acquirers rearrange targets to make use of their competitive advantage (Maksimovic et al. 2011) or to gain required resources (Casciaro and Piskorski 2005, Haleblian et al. 2009).

On the basis of aforementioned arguments, firms engaging in M&A activities would potentially have more opportunities to cut slack resources and adjust their costs than firms not engaging in M&A activities. The first hypothesis, therefore, is stated as follows:
H1: Cost stickiness behaviour differs between M&A firms and non-M&A firms.

4.2.2 The effect of firm life cycle on the cost stickiness of acquiring firms

The theory of firm life cycle argues that firms experience different levels of financing activities, risks, strategic choices and resources at different stages of their life cycle progression (Helfat and Peteraf 2003, Dickinson 2011). Dickinson (2011) draws on resource availability and management of cash flows to delineate five distinct stages of firm life cycle (i.e. introduction, growth, mature, shakeout, and decline). Firms in the introduction stage may rely on debt financing to grow but servicing that debt may reduce cash flows (Myers 1977, Barclay and Smith 2005). Managerial optimism pushes firms to enter the market ahead of competitors (Spence 1977, Spence 1979, Spence 1981) with the effect that firms in the introduction stage have negative investment-related cash flows (Dickinson 2011). Firms may make significant investments in the early stages of their life cycle to expand market share, achieve economies of scale, and discourage future rivals from entering that market (Spence 1979, Spence 1981). Lee (2018) finds that the life cycle stage of a firm is connected with managers' future growth goals. Compared to mature firms, firms in the introduction stage might have more cost stickiness (Lopatta et al. 2020), as they generally face cash constraints, high demands and high volatility (Owen and Yawson 2010). At this stage, businesses are small, managers are inexperienced with future sales and costs (Jovanovic 1982) and their key goal is to position themselves in the market successfully (Cyert and March 1963, Salancik and Pfeffer 1978). Firms in the early stages of their life cycle have to establish a competitive business model in order to increase their market share over that of their rivals and to impede the entrance of other firms and, hence, firms make significant investments in infrastructure and services (Spence 1979).

Growth firms have greater access to debt financing compared with firms in the introduction stage (Myers 1977, Barclay and Smith 2005). Profit margins are maximised when investment and efficiency are increased (Spence 1979, Wernerfelt 1985), implying that operating cash flows are positive during the growth and mature stages (Dickinson 2011). A decline in sales over time is a sign of a more permanent shift in activity levels, which would result in decreased cost stickiness (Lopatta et al. 2020). On the other hand, managers may view revenue declines as more transient during times of economic expansion, resulting in higher levels of SG&A cost stickiness (Lopatta et al. 2020). According to Kama and Weiss (2013), management incentives to achieve objectives lead to decreased SG&A cost stickiness, since managers are more inclined to cut expenses if sales drop. Based on successful market entry, growth firms are more predictable than introduction stage firms (Vorst and Yohn 2018).

Mature stage firms pursue productivity by increasing business and consumer awareness (Spence 1981, Wernerfelt 1985). Markets are more well-known at this stage, with less uncertainty than businesses in the development stages (Habib and Hasan 2019). According to Jensen (1986), mature companies tend to overinvest in their main business (or in an unrelated core acquisition). When mature companies have exhausted their positive net present value investment options, they either start servicing debt, or disperse capital, resulting in suboptimal initiatives that reduce overall profitability (Dickinson 2011, Lopatta et al. 2020). Based on firm life cycle stage development, mature stage firms refresh old properties to prevent obsolescence and to preserve competition (Jovanovic 1982, Wernerfelt 1985). They can also add assets to develop new markets and cut assets in poorly functioning markets.

Declining businesses tend to reduce asset underperformance. However, fixed assets such as plant and equipment are not easy to change in this stage (high resistance) and their related costs include out-of-pocket expenses and management time and effort to purchase or dispose of such assets (Wernerfelt 1985). Firms in the mature or decline stages will likely decrease their level of investment owing to sluggish business growth and reduced revenue derived from acquisitions (Porter 1980). However, decline stage firms lose competitiveness. Loss in competition results in decreased revenue and a decline in prices (Wernerfelt 1985), with the effect of liquidation of assets to service debt. Given cash preservation has a strong link with firm survival, businesses at this stage reduce underperforming assets and focus on either debt reduction or renegotiation, leading to more sticky costs.

As acquiring firms in different stages of their firm life cycle have different patterns in revenue and costs, I develop the second hypothesis as below:

H_2: Cost stickiness behaviour in acquiring firms varies across different stages of their life cycle progression.

4.2.3 The effect of other channels on the relationship between firm life cycle and cost stickiness for firms engaging in M&A activities

4.2.3.1 Capital expenditure (CAPEX)

Acquisitions necessitate a high level of organisational ability in integrating operations, while capital expenditures incorporate decisions affecting current operations (Maksimovic and Phillips 2008). A substantial body of literature suggests that changes in sales growth and capital expenditure signal the firms' strategic focus (e.g., capturing market share and expanding capital capacity versus cost cutting) (Spence 1977, Spence 1979, Spence 1981, Anthony and Ramesh 1992). Moreover, the cost effectiveness of a strategy varies with firm life cycle stages. The fundamental concept captured in the report of the Boston Consulting Group (BCG 1968) is that firms maximise revenue growth to produce permanent cost or demand-advantages over competitors in their early life cycle stage, but have slower market growth in their mature stages with lower-rewarding investments (Porter 1980). It is often argued that a firm's growth and capital strategy depends upon the stage of its firm life cycle, as the benefit/cost ratio of market share acquisition and construction capacity is at its greatest in the early stage (Anthony and Ramesh 1992). Spence (1977) indicates that firms can discourage entry by other firms through developing capacities and incurring major capital expenditures in an early stage of their life cycle, thereby, making the market unattractive for prospective entry-level firms. Growth rates are seen as an indicator of the financial strength of an enterprise and may lead to higher requirements for raising equity funds from outside sources. Firms with high growth rates need to increase additional funding to support their capital expenditure strategy (Anthony and Ramesh 1992, Alkhatib 2012). The capital expenditure ratio is used for investment opportunities (Titman and Wessels 1988, Rajan and Zingales 1995, Gaud et al. 2005, Akhtar and Oliver 2009), or to measure the opportunities for growth (Berger and Ofek 1995). Better investment opportunities for firms are needed to achieve high levels of performance (Anthony and Ramesh 1992).

The theory of economic behaviour takes into consideration that asymmetrical cost behaviour is caused by managers' rational decisions on resource adjustment costs; that is, managers do not react adequately to short-term income reductions, in order to control long-term re-financing costs (Banker et al. 2008). Consequently, the higher the costs for resource adjustment (e.g. capital expenditures or staffing levels), or the more ambiguous the manager's progress (e.g. sales or return fluctuations), the more costs reflect stickiness behaviour. From the perspective of dynamic resource theory, the early stages of the corporate life cycle are likely to fail in human capital, social capital and resources (e.g. finance, technology and material) (Helfat and Peteraf 2003). Owing to uncertainties regarding future cash flows, earnings and potential challenges in raising additional capital in the early stages of the life cycle, firms may have high capital costs (Jenkins et al. 2004, Hasan et al. 2015). In the mature

stage, firms might have a greater competitive advantage by using resources, and managing capacity and maintenance (Gray and Ariss 1985, Helfat and Peteraf 2003). The continuous security of the operational cash flows, income, innovations and investments, and profit margins of mature firms, may make these firms less susceptible to financial distress. On the basis of the above discussion, I posit the following hypothesis:

H_{3a}: The level of capital expenditure is related to the cost stickiness behaviour of acquiring firms differently at different stages of a firm's life cycle progression.

4.2.3.2 Research and development (R&D)

Aghion and Howitt (1992) indicate that firms with the expertise to run with input of the same production factors would generate relatively greater firm value. Investment in research and development (R&D) is becoming a core strategy of firms, because growth strategies based on technological innovation are needed in the long term to ensure long-term growth potential (Yoo et al. 2019). R&D investment has a direct impact on future profitability, because it allows for the growth of new products and technologies (Chun et al. 2014) and can also reduce costs, thus, positively affecting future performance. R&D outcomes, on the other hand, are uncertain, which means that the consequences of R&D investment do not always have a positive impact on firm value (Yoo et al. 2019). Amir et al. (2007) show that R&D investment has higher future uncertainty than tangible asset investment in industries with high R&D intensity, while there is no difference in industries with low R&D intensity. Through technological innovation and new product development, R&D investment has a positive impact on future management performance (Chauvin and Hirschey 1993). Furthermore, due to factors such as time lag, costliness, and non-application, R&D investment has a negative effect by increasing future uncertainty (Kay 1988).

In the introduction stage of firm life cycle, firms enter the market first with a high level of risk and uncertainty (Yoo et al. 2019). In the growth phase, firms experience rapid growth and competition, and they invest continually in R&D to increase competitiveness (Yoo et al. 2019). The mature phase is a period of fierce competition with stagnant sales and business growth, and firms in this stage reap the benefits of R&D innovation (Fellner 1951). In contrast, firms in the decline phase face a reduction in growth, and they need to implement a recuperation strategy, thereby minimising the impact of R&D investment (Miller and Friesen 1984, Anthony and Ramesh 1992, Dickinson 2011).

R&D may decrease in response to M&As because duplicated R&D has been eliminated. However, M&As may achieve R&D economies of scale, so acquiring firms may have more incentives than before the M&A event to carry out further R&D investment (Cassiman et al. 2005). Jensen and Ruback (1983) argue that M&As are often used to address inadequacies, agency problems and

imperfections in capital markets. Previous research shows that an increased financial leverage of M&A activities affects R&D financing by increasing the opportunity costs of R&D investment, resulting in the elimination of R&D projects and higher risk aversion in R&D project selection (Jensen and Ruback 1983, Cassiman et al. 2005). The dimension of technological relatedness is of particular importance, in order to better understand the relationship between M&As and R&D (Cassiman et al. 2005). Kogut and Zander (1992) provide evidence relating to the integration of expertise from both technological and organisational perspectives and the acquisition of knowledge bases. As common skills and languages allow easier technical communication, firms are likely to face challenges in applying new and unrelated knowledge (Haspeslagh and Jemison 1991). In addition, firms face differences in the management environment, organisational structure and strategy in each stage of their life cycle progression (Miller and Friesen 1984, Anthony and Ramesh 1992, Dickinson 2011). I therefore investigate whether the impacts of R&D expenditures on the cost of stickiness are different according to each firm life cycle, reflecting the differences in firms' strategy during M&A activities. On the basis of the above discussion, I posit the following hypothesis:

H3b: The level of R&D expenses is related to the cost stickiness behaviour of acquiring firms differently in different stages of a firm's life cycle.

4.3 Research design

4.3.1 Sample selection and data

Thomson Reuters SDC Platinum was used to obtain M&A transactions announced by listed U.S. firms over the 30-year period from January 1990 to December 2019. Following previous literature (Bris 2005, King 2009, Shen et al. 2014, Lee 2018), I include all M&A deals that have been completed, but transactions on leveraged buyouts, spinoffs, exchange offers, recapitalisations, self-tenants, repurchases, remaining interest acquisitions, acquisitions of minority shares, and privatisations are removed from the sample (73,332 firm-year observations). I exclude multiple takeover announcements (25,169 firm-year observations) and announcements of firms in financial and utility industries (24,987 firm-year observations). The sample is further decreased by 6,823 firm-year observations after merging M&A data with financial data from Compustat. The sample is further decreased by 2,399 firm-year observations after excluding observations which do not meet the requirements for calculating the cost asymmetry of the SG&A expenses:

- Sales and SG&A costs are not available or recorded as zero for both the current and prior year;
- Ratio of sales current year to prior year ($Sales_t/Sales_{t-1}$) and that of SG&A expenses current year to prior year ($SG\&A_t/SG\&A_{t-1}$) are not negative.

The final M&A sample consists of 13,954 firm-year observations.

For the first hypothesis (H1), I require a sample of firms not involved in M&A transactions. All U.S. firms in the Compustat database over the period of 1990–2019 that do not have acquisition activities in the current year are initially included in the sample (311,911 firm-year observations). Following the sample procedure with the M&A sample, I exclude 112,010 firm-year observations for financial and utility industries, 124,058 observations for financial data unavailability, 9,100 observations which do not meet the requirements for calculating the cost asymmetry of the SG&A expenses. The final non-M&A sample consists of 66,743 firm-year observations. A summary of sample derivation for M&A and non-M&A samples is provided in Panel A of Table 4-1.

Panel B, Table 4-1 provides the sample distribution for both M&A and non-M&A samples based on the 48 industry classifications by (Fama and French 1997). The majority of firms in the non-M&A sample are in the Business Services sector (13.60%), followed by Electronic Equipment (11.27%), Retail (8.20%), and Pharmaceutical Products (7.29%). Similar pictures are observed in the M&A sample with the highest concentration of M&A firms in the Business Services sector (19.50%), followed by Electronic Equipment (10.23%), then Computers (8.52%).

Table 4-1 Sample Specifications and Industry distribution

Panel A: Sample selection		
Original sample [from Compustat (1990–2019)]	325,865	
Less firms involved in M&A transactions in the year	(13,954)	
Total companies that do not have acquisition activities in the current year	311,911	
Less financial and utility firms (SIC 60–69 and 49)	(112,010)	
Less firms for which accounting data for the regression analysis is missing	(124,058)	
Fewer firms that do not meet the requirements for calculating the cost asymmetry of the SG&A expenses	(9,100)	
Non-M&A sample total		**66,743**
M&A announcements [from SDC Platinum (1990–2019)]	73,332	
Less multiple acquisitions announced by firms	(25,169)	
Less financial and utility firms (SIC codes 60–69 and 49)	(24,987)	
Less firms with missing accounting data after merged with Compustat	(6,823)	
Fewer firms that do not meet the requirements for calculating the cost asymmetry of the SG&A expenses	(2,399)	
M&A sample total		**13,954**
Total Sample (M&A and non-M&A)		**80,697**

Panel B: Industry distribution					
Non M&A sample	N	%	M&A sample	N	%
Business services	9,078	13.60	Business Services	2,721	19.50
Electronic equipment	7,519	11.27	Electronic Equipment	1,428	10.23
Retail	5,475	8.20	Computers	1,189	8.52
Pharmaceutical Products	4,866	7.29	Machinery	815	5.84
Computers	4,335	6.50	Medical Equipment	813	5.83
Medical Equipment	4,226	6.33	Retail	787	5.64
Machinery	3,574	5.35	Wholesale	715	5.12
Measuring and Control Equipment	2,571	3.85	Pharmaceutical Products	677	4.85
Wholesale	2,371	3.55	Measuring and Control Equipment	651	4.67
Chemicals	2,203	3.30	Chemicals	433	3.10
Remaining industries	20,525	30.75	Remaining industries	3,725	26.69
Total	**66,743**	**100**	**Total**	**13,954**	**100.00**

4.3.2 Model specifications

The original model of cost stickiness developed by Anderson et al. (2003) is as follows:

$$log\left(\frac{SG\&A_{i,t}}{SG\&A_{i,t-1}}\right) = a_{0\,i,t} + \beta_1\ log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) + \beta_2\ DEC * log\left(\frac{Sales_{i,t}}{Sales_{i,t-1}}\right) + \varepsilon_{i,t} \quad \text{(Equation 4.1)}$$

The model determines the percentage change in SG&A costs for a change of one percent in sales. *DEC* is a dummy variable that is triggered in year *t* when sales decrease. The percentage increase in SG&A costs is, therefore, measured by the coefficient β_1 with a one percent increase in

sales. When sales decrease by one percent, the sum of coefficients, $\beta_1+\beta_2$, measures the percentage decline in SG&A costs. If SG&A costs are sticky, I expect to observe $\beta_1>0$ and $\beta_2<0$ (Anderson et al. 2003). The smaller the sum of coefficients ($\beta_1+\beta_2$) or the larger absolute value of β_2, the greater the cost stickiness.

Following prior literature (e.g. Anderson et al. 2003, Banker and Chen 2006, Lee 2018), I include other firm financial characteristics into model 4.1, and run the following baseline ordinary least squares (OLS) regression model to investigate whether cost stickiness behaviour is different in M&A firms and non-M&A firms (the first hypothesis - H1):

$$\begin{aligned}\Delta\ln SG\&A_{i,t} = a_{0\,i,t} + \beta_1 \Delta\ln SALE_{i,t} + \beta_2 DEC\Delta\ln SALE_{i,t} + \beta_3 \text{Assets Intensity}_{i,t} \\ + \beta_4 \text{EMPLOYMENT}_{i,t} + \beta_5 \text{SECC DEC}_{i,t} + \beta_6 \text{SIZE}_{i,t} \\ + \beta_7 \text{R\&D Intensity}_{i,t} + \beta_8 \text{LEV}_{i,t} + \beta_9 \text{ PPE DEC}_{i,t} + \beta_{10} \text{ GM}_{i,t} \\ + \beta_{11} \text{ ROE}_{i,t} + IND_{FE} + YEAR_{FE} + \varepsilon_{i,t}\end{aligned} \quad \text{(Equation 4.2)}$$

To examine whether cost stickiness among M&A firms is moderated by the firm life cycle, I classify M&A firms in the sample into various stages of their life cycle progression by adopting the model of Dickinson (2011). Arguing that cash flows can capture the variations in firm growth, profitability and risk, Dickinson (2011) categorises firms in different stages based on relative differences in cash flows from operations, investments and financing activities with five stages delineated as the introduction, growth, mature, shakeout, and decline phases of the life cycle. To investigate the impact of firm life cycle on the cost stickiness of acquiring firms (the second hypothesis, H2), the following model is estimated:

$$\begin{aligned}\Delta lnSG\&A_{i,t} = a_{0\,i,t} + \beta_1 \Delta lnSALE_{i,t} + \beta_2 DEC\Delta lnSALE_{i,t} + \beta_3 INTRO_{i,t} \\ + \beta_4 INTRO \times DEC\Delta lnSALE_{i,t} + \beta_5 GROWTH_{i,t} \\ + \beta_6 GROWTH \times DEC\Delta lnSALE_{i,t} + \beta_7 MATURITY_{i,t} \\ + \beta_8 MATURITY \times DEC\Delta lnSALE_{i,t} + \beta_9 SHAKEOUT_{i,t} \\ + \beta_{10} SHAKEOUT \times DEC\Delta lnSALE_{i,t} + \beta_{11} DECLINE_{i,t} \\ + \beta_{12} DECLINE \times DEC\Delta lnSALE_{i,t} + \beta_{13} Assets\ Intensity_{i,t} \\ + \beta_{14} EMPLOYMENT_{i,t} + \beta_{15} SECC\ DEC_{i,t} + \beta_{16} SIZE_{i,t} \\ + \beta_{17} R\&D\ Intensity_{i,t} + \beta_{18} LEV_{i,t} + \beta_{19}\ PPE\ DEC_{i,t} \\ + \beta_{20}\ GM_{i,t} + IND_{FE} + YEAR_{FE} + \varepsilon_{i,t}\end{aligned} \quad \text{(Equation 4.3)}$$

In cross-sectional tests, this study further examines how capital expenditure (CAPEX), and research and development (R&D) are related to the cost stickiness of acquiring firms across different life cycle stages (H3a and H3b). Definitions of these moderating variables are in Appendix 4.1. In doing this, I perform subsample analyses (Anthony and Ramesh 1992, Banker and Chen 2006, Maksimovic and Phillips 2008) and re-estimate equation 4.3 for each of the two subsamples. In

particular, the original sample is partitioned into the two sub-samples of firms with Big4 versus non-Big4 auditors; firms with high versus low capital expenditure (CAPEX); firms with high versus low research and development (R&D). I control for the fixed effects of both year and industry in all of the regression analyses. All regressions are estimated with standard errors clustered by firms. The 1st and 99th percentiles are winsorized for all variables to decrease the potential effect of outliers.

4.3.3 Control variables

Following prior studies, I control for other factors that could potentially affect SG&A cost asymmetry, such as asset intensity (*Assets Intensity*), employee intensity (*EMPLOYMENT*) (Anderson et al. 2003), and successive declines in sales (*SECC DEC*) (Anderson et al. 2003, Anderson et al. 2007, Chen et al. 2012), since managers are more likely to perceive a negative demand shock to be permanent when there are sales declines in two consecutive years. Additionally, based on prior literature related to cost stickiness (Banker and Chen 2006, Calleja et al. 2006, Anderson et al. 2007, Banker et al. 2008, Chen et al. 2012, Lee 2018, Fourati et al. 2020, Lopatta et al. 2020), I control for property, plant and equipment decrease (*PPE_DEC*), gross margin ratio (*GM)*, research and development intensity (*R&D Intensity*), firm size (*SIZE*), firm leverage (*LEV*), and return on equity (*ROE*). Appendix 4.1 contains definitions of these variables.

4.4 Empirical results

4.4.1 Descriptive statistics

The descriptive statistics of samples for non-M&A firms and M&A firms are reported separately Table 4-2. Generally, they are close to the values provided in previous research (Anderson et al. 2003, Banker and Chen 2006, Calleja et al. 2006, Anderson et al. 2007, Banker et al. 2008, Chen et al. 2012, Lee 2018, Fourati et al. 2020, Lopatta et al. 2020). Panel A of Table 4-2 provides summary statistics on annual revenues and SG&A costs, and shows that sales and SG&A expenses exhibit a wide range of variation. For the non-M&A sample, firms have mean (median) sales of $3,104 million ($130 million) and SG&A costs of $557 million ($40 million). It is clear that M&A firms have higher levels of sales and SG&A expenses with the corresponding figures for sales of $4,595 million ($451 million) and for SG&A costs of $980 million ($124 million).

Panel B of Table 4-2 shows descriptive statistics on the remaining variables that are used in this study, separately for M&A and non-M&A firms. The average changes in the natural logarithm of SG&A expenses and of sales in the non-M&A sample are 8.3% and 9.5%, respectively, while these figures are higher for M&A firms (18.3% and 18.9%). There are approximately 7.8% of non-M&A firms with a decrease in sales compared with the last year, but only 3.4% of M&A firms experience this decrease. The ratio of the number of employees (or total assets) to sales as the natural logarithm

for non-M&A firms *(EMPLOYMENT* or *Asset Intensity*) is, on average, -5.17 (or 0.074), indicating that the number of employees (or total assets) is equivalent to 0.57% (or $1.07 million) of sales revenue. Those equivalent figures are higher for non-M&A firms where the natural logarithm is -5.30 (or 0.15). Neither M&A nor non-M&A firms have experienced two consecutive years of sales decreases in the past two years (the mean value of *SECC DEC* is 0.35 and 0.22, respectively).

Consistent with prior literature (Grinstein and Hribar 2004, Bugeja et al. 2012), M&A firms are larger in size compared with non-M&A firms, with average total assets (in natural logarithms) of 6.27 and 4.99 (or $147,377 million and $526,894 million), respectively. However, the average R&D expenses for M&A (or non-M&A) firms is 12.4% (or 27.2%) of total sales. Compared with the non-M&A sample, firms in the M&A sample have not experienced a decrease in their property, plant and equipment (*PPE_DEC*) between years *t-1* and *t*. The level of short-term and long-term debt is almost the same for firms in the two subsamples, with the average figure for the *LEV* variable of 27.6% for non-M&A firms and 20.3% for M&A firms. It is evident that M&A firms are more profitable than non-M&A firms, with figures for return on equity (*ROE*) and gross margin (*GM*) of -0.2% and -1.7%, compared with -4.3% and -0.8%, respectively. Finally, the non-M&A sample contains 20.3% firms in the introduction stage, 23.8% firms in the growth stage, 37.5% in the mature stage, 9.9% in the shakeout stage, and 8.3% in the decline stage. The equivalent figures for the M&A samples are 13.5% in the introduction stage, 40% in the growth stage, 35.1% in the mature stage, 7.1% in the shakeout stage, and 4.4% in the decline stage.

Table 4-2 Descriptive Statistics

Panel A: Data description

	Non-M&A sample			M&A sample		
	Mean	**S.D**	**Median**	**Mean**	**S.D**	**Median**
Sales Revenue (millions)	$ 3,104	$ 16,720	$130	$4,595	$ 19,042	$ 451
SG&A (millions)	$ 557	$ 2,458	$40	$980	$ 3,889	$ 124

Panel B: Summary statistics

	Non-M&A sample				M&A sample			
	N	Mean	S.D	Median	N	Mean	S.D	Median
ΔlnSG&A	66743	0.083	0.297	0.062	13954	0.183	0.293	0.124
Δln$SALE$	66743	0.095	0.409	0.067	13954	0.189	0.367	0.125
DECΔln$SALE$	66743	-0.078	0.214	0.000	13954	-0.034	0.134	0.000
Assets Intensity	66743	0.074	0.819	-0.016	13954	0.150	0.661	0.099
EMPLOYMENT	66743	-5.171	0.890	-5.190	13954	-5.297	0.788	-5.315
SECC DEC	66743	0.355	0.479	0.000	13954	0.221	0.415	0.000
SIZE	66743	4.993	2.534	4.885	13954	6.267	2.120	6.221
R&D Intensity	66743	0.272	1.973	0.037	13954	0.124	0.697	0.039
LEV	66743	0.276	0.532	0.158	13954	0.203	0.194	0.173
PPE DEC	66743	0.219	0.414	0.000	13954	0.123	0.328	0.000
GM	66743	-0.008	0.444	-0.001	13954	-0.002	0.248	-0.000
ROE	66743	-0.043	1.487	0.068	13954	-0.017	0.967	0.092
INTRO	66743	0.203	0.402	0.000	13954	0.135	0.341	0.000
GROWTH	66743	0.238	0.426	0.000	13954	0.400	0.490	0.000
MATURITY	66743	0.375	0.484	0.000	13954	0.351	0.477	0.000
SHAKEOUT	66743	0.099	0.298	0.000	13954	0.071	0.256	0.000
DECLINE	66743	0.083	0.275	0.000	13954	0.044	0.204	0.000

4.4.2 Correlation matrix analysis

This study presents the Pearson pairwise correlation matrix for the M&A sample with other control variables in Table 4-3. It shows that the correlation between Δ$lnSG\&A$ and Δ$lnSALE$ is 0.731 and the correlation between Δ$lnSG\&A$ and DECΔln$SALE$ is 0.264, indicating that M&A firms exhibit cost stickiness. In the non-M&A sample[23], the correlation between Δ$lnSG\&A$ and Δ$lnSALE$ is 0.547 and the correlation between Δ$lnSG\&A$ and DECΔln$SALE$ is 0.327 indicating that non-M&A firms exhibit different cost stickiness behaviour.

[23] The results will be available upon request.

Table 4-3 Correlation Statistics for M&A firms

	Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1)	ΔlnSG&A	1.000																
(2)	Δln$SALE$	0.731*	1.000															
(3)	DECΔln$SALE$	0.264*	0.522*	1.000														
(4)	Assets Intensity	0.160*	0.124*	-0.186*	1.000													
(5)	EMPLOYMENT	0.137*	0.105*	-0.085*	0.145*	1.000												
(6)	SECC DEC	-0.129*	-0.078*	-0.105*	0.041*	0.051*	1.000											
(7)	SIZE	-0.192*	-0.165*	0.116*	0.091*	-0.415*	-0.072*	1.000										
(8)	R&D Intensity	0.048*	-0.049*	-0.295*	0.313*	0.159*	0.034*	-0.094*	1.000									
(9)	LEV	-0.058*	-0.044*	0.022*	-0.039*	0.040*	0.014	0.187*	-0.057*	1.000								
(10)	PPE DEC	-0.273*	-0.254*	-0.280*	0.012	-0.025*	0.172*	0.013	0.025*	0.011	1.000							
(11)	GM	-0.026*	-0.148*	-0.095*	-0.015	-0.013	-0.012	0.009	0.064*	0.007	0.009	1.000						
(12)	ROE	-0.040*	-0.021	0.129*	-0.097*	-0.095*	-0.042*	0.152*	-0.096*	0.043*	-0.050*	-0.009	1.000					
(13)	INTRO	0.264*	0.243*	-0.074*	0.125*	0.176*	0.055*	-0.337*	0.109*	0.026*	-0.011	-0.012	-0.138*	1.000				
(14)	GROWTH	0.097*	0.085*	0.123*	-0.000	0.021	-0.104*	0.018	-0.056*	0.100*	-0.153*	0.003	0.072*	-0.322*	1.000			
(15)	MATURITY	-0.227*	-0.201*	0.057*	-0.174*	-0.153*	0.005	0.302*	-0.063*	-0.050*	0.029*	0.004	0.102*	-0.290*	-0.600*	1.000		
(16)	SHAKEOUT	-0.074*	-0.071*	-0.086*	0.062*	-0.038*	0.054*	-0.016	0.004	-0.073*	0.150*	0.007	-0.014	-0.109*	-0.225*	-0.203*	1.000	
(17)	DECLINE	-0.052*	-0.051*	-0.195*	0.121*	0.060*	0.079*	-0.162*	0.094*	-0.076*	0.131*	-0.005	-0.161*	-0.084*	-0.174*	-0.157*	-0.059*	1.000

Note: This table presents the Pearson correlations matrices among cost stickiness variables and all other control variables for firms engaged in M&A deal. * shows significance at the 0.01 level

4.4.3 Regression results

4.4.3.1 M&A activities and cost stickiness (H1)

To examine H1, I perform analyses on the level of cost stickiness behaviour for the two samples (non-M&A versus M&A firms) and present the results in Panel A of Table 4-4. For M&A firms (Column 1), the estimated value of B_1 in model (4.2) is 0.599 (t-statistic =102.42), showing that SG&A costs increase 0.60% for a 1% increase in revenues. The estimated value of B_2 of -0.259 (t-statistic = -3.14) provides evidence of the presence of the sticky costs occurring with M&A deals. The sum of $B_1 + B_2$ =0.30 indicates that SG&A costs decrease by only 0.30% for each 1% decrease in the revenues of acquiring firms. The results in B_1 and $B_1 + B_2$ are statistically significant at $p<0.01$. This indicates that SG&A costs were not proportional to changes in revenue, even though this cost driver is apparently strong. For non-M&A firms (Column (2) of Panel A), the estimated value of B_1 in model (4.2) is 0.423 (t-statistic =126.98), showing that SG&A costs increase 0.42% for each 1% increase in revenues for a firm not engaging in M&A activities. The estimated value of B_2 of -0.273 (t-statistic = -10.89) provides evidence of sticky costs occurring for firms not engaging in M&A deals. The sum of $B_1 + B_2$ =0.15 indicates that SG&A costs decrease only 0.15% for each 1% decrease in revenues, based on the non-M&A sample. The results in B_1 and $B_1 + B_2$ are statistically significant at $p<0.01$, implying that firms engaging in M&A activities have different cost stickiness behaviour to non-M&A firms.

This study conducts additional tests of the mean differences in the cost stickiness main variables (Δln SG&A, Δln $SALE$ and $DEC\Delta\ln SALE$) between the two subsamples of M&A firms and non-M&A firms and report the results in Panel B of Table 4-4. I observe that the mean difference in Δln SG&A, Δln $SALE$ and $DEC\Delta\ln SALE$ across M&A firms and non-M&A firms is -0.094, -0.89 and -0.42, respectively. The mean differences between the two subsamples for those three variables are all significant at $p<0.01$. The analyses in Panel B support the finding that firms engaging in M&A deals have different cost stickiness behaviour.

I also perform additional analyses on the full sample and modify equation (4.2) to include the $M\&A$ variable (a dummy variable if firms announced takeover deals during the year) and the interaction variable $M\&A\times DEC\Delta\ln SALE$. The results are presented in Panel C of Table 4-4. I find similar results to the subsample analysis that presented in Panel A. The estimated value for $\Delta\ln SALE$ is 0.457 (*t*-statistic =155.61), showing that SG&A costs increase 0.46% for each 1% increase in revenues. The estimated value of $DEC\Delta\ln SALE$ is -0.305 (*t*-statistic = -12.95), and of $M\&A\times DEC\Delta\ln SALE$ is -0.035 (*t*-statistic = -2.28), indicating that there are differences in estimated coefficients of $DEC\Delta\ln SALE$ between M&A and non-M&A firms. In addition, the net effect of the

$DEC\Delta\ln SALE$ variable for M&A firms is -0.34 (-0.305-0.035), providing evidence of sticky costs occurring for firms engaging in M&A deals.

Table 4-4 Cost stickiness – M&A firms versus non-M&A firms

Panel A: Sub-sample analysis		
	M&A firms	**Non-M&A firms**
	(1)	**(2)**
Dependent variable:	**ΔlnSG&A**	
Δln*SALE*	**0.599*** **	**0.423*** **
	(102.42)	**(126.985)**
DEC*Δln*SALE	**-0.259*** **	**-0.273*** **
	(-3.14)	(-10.898)
Assets Intensity	0.025***	0.021***
	(7.37)	(12.673)
Assets Intensity×*DEC*Δln*SALE*	-0.175***	-0.060***
	(-11.37)	(-14.089)
EMPLOYMENT	-0.003	0.012***
	(-0.92)	(7.784)
EMPLOYMENT×*DEC*Δln*SALE*	0.044***	-0.014***
	(2.74)	(-2.923)
SECC_DEC	-0.043***	-0.031***
	(-10.27)	(-14.843)
SECC_DEC×*DEC*Δln*SALE*	-0.015	0.058***
	(-0.61)	(6.782)
SIZE	-0.002**	0.008***
	(-2.05)	(16.202)
SIZE×*DEC*Δln*SALE*	0.047***	0.026***
	(7.54)	(11.751)
R&D Intensity	-0.013***	-0.003***
	(-3.06)	(-4.578)
R&D Intensity×*DEC*Δln*SALE*	-0.004	-0.006***
	(-1.02)	(-7.853)
LEV	-0.028***	-0.043***
	(-3.06)	(-20.403)
LEV×*DEC*Δln*SALE*	-0.180***	-0.023***
	(-3.70)	(-5.849)
PPE_DEC	-0.062***	-0.085***
	(-11.33)	(-33.394)
PPE_DEC×*DEC*Δln*SALE*	0.283***	0.132***
	(11.35)	(14.767)
GM	0.090***	0.066***
	(12.07)	(26.406)
GM×*DEC*Δln*SALE*	0.084***	0.054***
	(6.09)	(15.941)
ROE	0.000	0.002**
	(0.23)	(2.377)
ROE×*DEC*Δln*SALE*	0.004	-0.004**
	(0.81)	(-2.381)
Constant	0.062	0.084***
	(1.46)	(4.346)
Observations	13,954	66,743
Adjusted R-squared	0.606	0.391
YEAR	YES	YES
INDUSTRY	YES	YES

Note: Panel A presents the regression results of cost stickiness for M&A and non-M&A firms. Variable definitions are in Appendix 4.1. Coefficient estimates are reported with *t*-statistics in parentheses. Statistical significance of the estimates is 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.

Panel B: Two-sample mean differences t-test

	M&A firms	Non-M&A firms	Mean differences	*t*-statistics for differences
ΔlnSG&A	.182	.088	-.094	-34.62
p-value		(0.000)		
Δln$SALE$	.189	.099	-.089	-24.25
p-value		(0.000)		
DECΔln$SALE$	-.034	-.076	-.042	-22.75
p-value		(0.000)		

Note: Panel B reports *t*-tests for mean differences between M&A and non-M&A subsamples. Variables are defined in Appendix 4.1. Robust *t*-statistics are in brackets. *, **, and *** denote two-tailed significance at p<0.1, 0.05 and 0.01, respectively.

Panel C: Full sample analysis with interaction variable

Dependent variable:	**Δln SG&A**
Δln $SALE$	0.457***
	(155.610)
DECΔln$SALE$	-0.305***
	(-12.951)
M&A	0.031***
	(13.687)
M&A#DECΔln$SALE$	**-0.035****
	(-2.282)
Observations	80,697
Adjusted R-squared	0.430
YEAR	YES
INDUSTRY	YES
Other control variables	YES

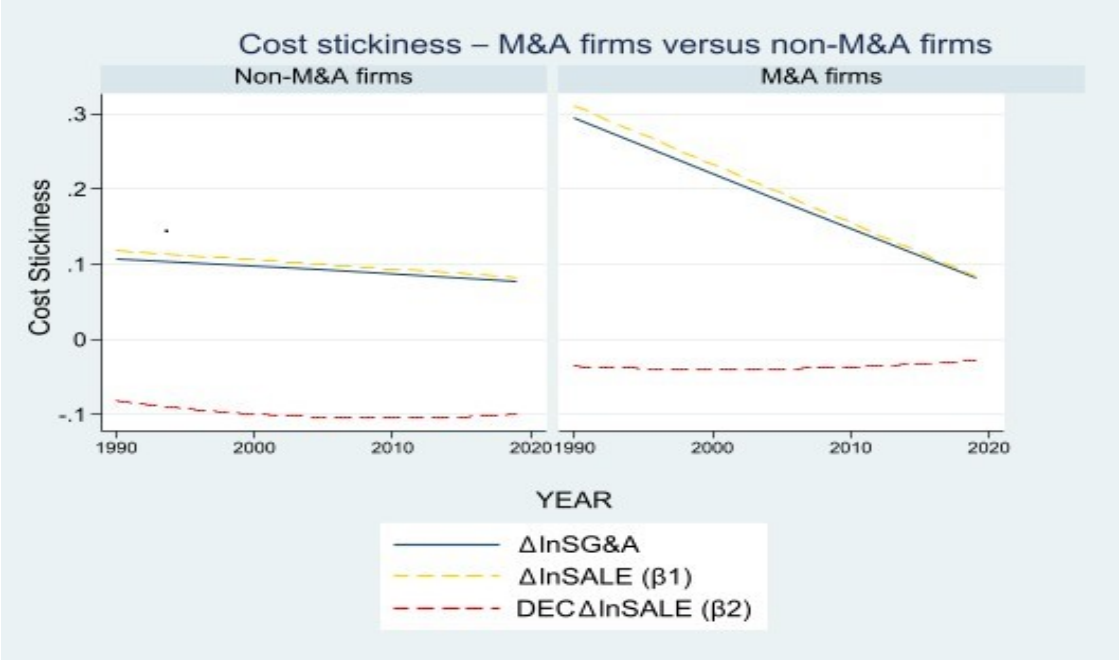
Note: Panel C reports the regression analysis on the full sample. *M&A* is a dummy variable if firms have any takeover announcement during the year. All other control variables are the same to those in Panel A and defined in Appendix A.

In additional analyses to examine when managers start to adjust their cost decisions around M&A announcement, I run regressions on our full sample (like the one presented in Panel C Table 4-4) separately for the announcement year, one year before and one year following takeover deals. In these three regressions, each of the M&A indicator variables ($M\&A_t$, $M\&A_{t-1}$ and $M\&A_{t+1}$) are interacted with DECΔln$SALE$. I find that the estimated coefficients of $M\&A_{t-1}\times DEC$Δln$SALE$ and $M\&A_{t+1}\times DEC$Δln$SALE$ are significantly positive (p<0.01) while that of $M\&A\times DEC$Δln$SALE$ is significantly negative[24]. The results indicate that firms have anti-stickiness cost behaviour in the year before and the year after their M&A activities, and the stickiness cost behaviour is only observed in the year of M&A announcements.

Figure 4-1 shows the components of the cost stickiness measures of the Anderson et al. (2003) model (ΔlnSG&A, Δln$SALE$, and DECΔln$SALE$), separately for M&A and non-M&A samples. It is clear that firms engaging in M&A activities have different cost stickiness behaviour compared with firms not engaging in M&A deals.

[24] For brevity, we do not present the regression results and they will be available upon request.

Figure 4-1 Cost stickiness – M&A firms versus non-M&A firms



4.4.3.2 Additional analysis: robustness check

In this section, I use three robustness tests to assess the validity of the base-line results provided in Table 4-4. Firstly, this study employs a propensity score matching (PSM) method to mitigate the chances of self-selection bias affecting the main results (Shipman et al. 2017). A probit regression is used to predict the probability of cost stickiness in M&A transactions. I match firms initially with cost stickiness by creating a dummy variable of 1 if a firm has a negative value for the interaction term between DEC and $\Delta\ln SALE$ (treatment group) to firms that do not have cost stickiness, measured as those with a positive value for the interaction term (control group), using propensity scores generated in the first stage probit model. For matching, firms are selected to have the nearest propensity for cost stickiness in M&A transactions, based on a calliper of 1%. I then re-estimate Equation 4.2 using the PSM sample, and report the findings of the PSM sample in Column (1) of Table 4-5. This study finds that the coefficient of the change in sales (B_1) is strongly positive (at $p<0.01$), and the coefficient of the interaction term between DEC and $\Delta\ln SALE$ (B_2) is negative (at $p<0.05$), suggesting that firms engaging in M&A activities incur cost stickiness.

Second, to deal with autocorrelation and heteroscedasticity problems, I use the generalised method of moments (GMM) analysis for further estimation techniques of dynamic panel results (Arelleno and Bover 1995, Blundell and Bond 2000). The GMM method can provide a simple mechanism for obtaining asymptotically efficient estimators in the presence of arbitrary heteroscedasticity, while taking the structure of residuals into account to produce consistent estimates (Arellano and Bond 1991, Bond 2002). To create orthogonality constraints, the lags of the dependent

variable in the regression are used as instruments, and the validity of additional moments is tested using a non-parametric estimator of the covariance matrix (Hansen 1982). I use a two-step robust GMM estimation, based on the finite-sample correction for the two-step covariance matrix of Windmeijer (2005) in order to obtain estimates that are more reliable and effective than the one-step GMM estimators. Column (2) in Table 4-5 shows the results of the system GMM with the lagged dependent variable being instrumented, while all other explanatory variables are treated as independent variables. It is evident that the GMM method produces similar results to those reported in Table 4-4.

Finally, I use the global financial crisis (GFC) as an exogenous shock to conduct a difference-in-difference (DID) test to further control for potential endogeneity issues. While cost stickiness prevails in a normal year, during the 2008-2009 crisis, revenue and costs were dramatically anti-sticky, suggesting exceptionally high pessimism (Banker et al. 2013, Roberts and Whited 2013). I separate the sample into two sub-periods to perform the DID analysis: 1990-2007 (before the GFC) and 2008-2019 (after the GFC). The regression results for model 4.2 are shown in Columns (3) and (4) of Table 4-5. I find that the coefficient of the change in sales variable ($\Delta lnSALE$), denoted as B_1, is strongly positive (at p<0.01), and the coefficient of the interaction term ($DEC\Delta lnSALE$) denoted as B_2 is significantly negative (at p<0.01). The DID results indicate that cost stickiness is M&A firms is significantly higher before the GFC.

Table 4-5 Cost stickiness in acquiring firms – Endogeneity tests

	Dependent variable: ΔlnSG&A			
	(1)	(2)	(3)	(4)
	PSM	GMM	DID	
			Before GFC	After GFC
L. ΔlnSG&A		0.127***		
		(7.699)		
Δln*SALE*	**0.535*** **	**0.580*** **	**0.607*** **	**0.540*** **
	(26.382)	**(30.352)**	**(88.339)**	**(43.271)**
DEC*Δln*SALE	**-0.531** **	**-0.211*** **	**-0.398*** **	**0.078**
	(-2.431)	(-5.627)	(-3.825)	(0.430)
Assets Intensity	0.025***	-0.002	0.028***	0.023***
	(2.846)	(-0.104)	(6.602)	(4.662)
Assets Intensity×DECΔln$SALE$	-0.135**		-0.155***	-0.186***
	(-2.349)		(-7.436)	(-7.457)
EMPLOYMENT	-0.001	0.117***	-0.008**	0.007*
	(-0.214)	(6.303)	(-2.022)	(1.693)
EMPLOYMENT×DECΔln$SALE$	-0.030		0.017	0.101***
	(-0.664)		(0.835)	(3.344)
SECC_DEC	-0.042***	-0.002	-0.053***	-0.018***
	(-6.137)	(-0.294)	(-9.751)	(-3.272)
SECC_DEC×DECΔln$SALE$	0.059		-0.041	0.113**
	(0.911)		(-1.324)	(2.524)
SIZE	-0.004**	0.102***	-0.002*	-0.003**
	(-2.255)	(7.310)	(-1.958)	(-2.201)
SIZE×DECΔln$SALE$	0.030*		0.044***	0.051***
	(1.826)		(5.518)	(4.700)
R&D Intensity	0.000	0.050	-0.016***	0.003
	(0.037)	(1.593)	(-3.271)	(0.201)
R&D Intensity×DECΔln$SALE$	0.005		-0.009*	-0.007
	(0.320)		(-1.662)	(-0.760)
LEV	-0.026	-0.046	-0.035***	0.003
	(-1.287)	(-1.484)	(-2.902)	(0.236)
LEV×DECΔln$SALE$	-0.049		-0.174***	0.040
	(-0.271)		(-3.010)	(0.351)
PPE_DEC	-0.068***	-0.039***	-0.077***	-0.037***
	(-9.478)	(-6.177)	(-10.472)	(-5.305)
PPE_DEC×DECΔln$SALE$	0.265***		0.288***	0.221***
	(4.051)		(9.441)	(4.889)
GM	0.086**	0.078***	0.067***	0.300***
	(2.036)	(2.818)	(7.620)	(16.669)
GM×DECΔln$SALE$	0.095		0.098***	0.254***
	(0.899)		(3.839)	(10.332)
ROE	0.000	-0.006	0.000	0.002
	(0.015)	(-1.381)	(0.113)	(0.778)
ROE×DECΔln$SALE$	-0.003		-0.004	0.042***
	(-0.210)		(-0.646)	(3.415)
Constant	0.025	0.124*	0.161***	0.019
	(0.244)	(1.842)	(3.123)	(0.357)
Observations	5,741	12,332	9,693	4,261
Adjusted R-squared	0.526		0.617	0.503
YEAR	YES	YES	NO	NO
INDUSTRY	YES	YES	YES	YES
Hansen (p-value)		580.42(0.085)		
Diff-Hansen (p-value)		562.17(0.201)		
AR 1 (p-value)		-10.72 (0.000)		
AR 2 (p-value)		1.06 (0.288)		
Groups (Instruments)		3483(627)		

Note: This table reports the results of endogeneity tests (propensity score matching [PSM], the generalised method of moment [GMM], and Difference-in-Difference [DID]).Variable definitions are in Appendix 4.1. Coefficient estimates are reported with *t*-statistics in parentheses. Statistical significance of the estimates is 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.

4.4.4 Cost stickiness of acquiring firms and firm life cycle (H2)

The second hypothesis (H2) examines the moderation effect of firm life cycle on cost stickiness of acquiring firms, as it is shown in the previous section that M&A firms have a different cost stickiness behaviour to non-M&A firms (H1). The regression results of acquiring firms' cost stickiness behaviour across five stages of the life cycle as categorised by Dickinson (2011) are provided in Columns (1)-(5) of Table 4-6. The estimated coefficients of the interaction term of *INTRO*×*DEC*Δ*lnSALE* is significantly negative (-0.176) at $p<0.01$, thereby, indicating that discretionary cost stickiness is higher for acquiring firms in the introduction stage (Column 1). The result is consistent with prior literature in that managers of firms in the introduction stage are optimistic with future revenue projections, lack experience, face high uncertainty, and have high expectations of the future (Jovanovic 1982, Owen and Yawson 2010), resulting in firms at this stage having higher cost stickiness attributable to the presence of agency conflicts.

In addition, the interaction term, *DECLINE*×*DEC*Δ*lnSALE* in Column (5) is significantly negative (-0.07) with $p<0.05$, supporting the notion that discretionary cost stickiness is higher for acquirers in the decline stage. This finding indicates that firms in the decline stage lose competitiveness, resulting in a decrease of revenue and prices (Wernerfelt 1985). Businesses at this stage often reduce underperforming assets to preserve cash, and focus on either debt reduction or renegotiation, leading to more sticky costs.

The estimated coefficients of the interaction term of *GROWTH*×*DEC*Δ*lnSALE, MATURITY*×*DEC*Δ*lnSALE,* and *SHAKEOUT*×*DEC*Δ*lnSALE* (Columns (2)-(4) of Table 4-6) are all positive and significant at levels of 1% and 5%. The results indicate that acquiring firms in the growth, maturity or shakeout stage show anti-stickiness cost behaviour. Firms in the growth stage have greater access to debt financing, and their profit margins are maximised when investment and efficiency are increased (Spence 1979, Wernerfelt 1985), incentivising them to avoid sticky costs. Firms in the mature stage are less uncertain about the future, and they tend to overinvest, or refresh old properties, to prevent obsolescence and to preserve competitiveness (Porter 1980), making them less prone to cost stickiness.

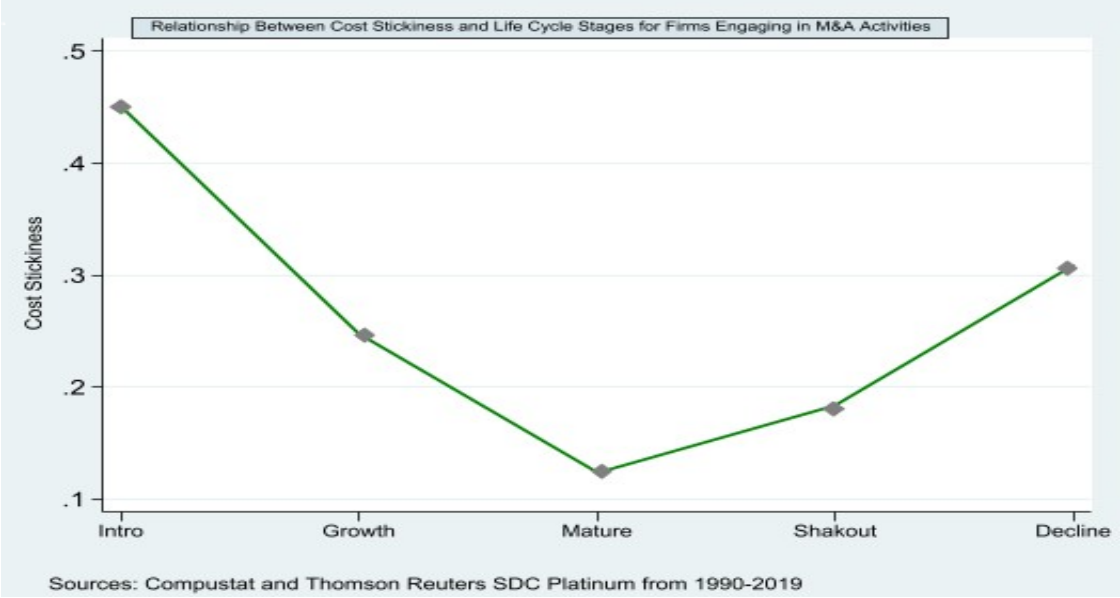
Table 4-6 Cost stickiness in acquiring firms – the impact of firm life cycle

	(1)	(2)	(3)	(4)	(5)
Dependent variable:			**ΔIn SG&A**		
Δln$SALE$	0.591***	0.598***	0.595***	0.599***	0.598***
	(99.29)	(102.43)	(101.21)	(102.31)	(102.45)
DECΔln$SALE$	-0.138*	-0.283***	-0.280***	-0.261***	-0.252***
	(-1.65)	(-3.44)	(-3.38)	(-3.16)	(-3.06)
INTRO	0.031***				
	(5.74)				
INTRO×DECΔln$SALE$	**-0.176*** **				
	(-6.05)				
GROWTH		0.020***			
		(5.81)			
GROWTH×DECΔln$SALE$		**0.130*** **			
		(3.19)			
MATURITY			-0.022***		
			(-5.76)		
MATURITY×DECΔln$SALE$			**0.089** **		
			(2.43)		
SHAKEOUT				-0.011*	
				(-1.69)	
SHAKEOUT×DECΔln$SALE$				**0.075** **	
				(2.27)	
DECLINE					-0.062***
					(-6.98)
DECLINE×DECΔln$SALE$					**-0.070** **
					(-2.37)
Constant	0.046	0.060	0.071*	0.061	0.069
	(1.08)	(1.43)	(1.67)	(1.45)	(1.62)
Observations	13,954	13,954	13,954	13,949	13,954
Adjusted R-squared	0.609	0.607	0.608	0.606	0.608
YEAR	YES	YES	YES	YES	YES
INDUSTRY	YES	YES	YES	YES	YES
CONTROL	YES	YES	YES	YES	YES

Note: This table presents the regression results of cost of stickiness and M&A deals in the present of firm life cycle. Variable definitions are in Appendix 4.1. Coefficient estimates are reported with *t*-statistics in parentheses. Statistical significance of the estimates is 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.

Figure 4-2 plots the cost stickiness of acquiring firms in the sample over the five different stages of Dickinson (2011)'s firm life cycle. It is clear that acquiring firms' cost stickiness is higher in the introduction and decline stages, but acquiring firms in the growth, maturity, or shakeout stages have anti-stickiness behaviour.

Figure 4-2 Acquiring firms' cost stickiness over different firm life cycle



4.4.4.1 Alternative proxy for firm life cycle

As a robustness check of the regression results, I employ another proxy for the firm life cycle that developed by DeAngelo et al. (2006), retained earnings to total assets (*RE/TA*). The original sample is divided into three sub-samples (young, mature and old) to reflect three life cycle stages. Young firms are in the bottom one-third of the *RE/TA* cohort, mature firms are in the middle one-third and old firms are in the top third. I rerun model (4.3) with the firm life cycle classified by DeAngelo et al. (2006) and present the results in Table 4-7. In Column (1) of Table 4-7, the estimated value of B_1 for young firms is 0.479 (t-statistic =40.95), showing that SG&A costs increase 0.48% for a 1% increase in revenues. The estimated value of B_2 for young firms is -0.262 (t-statistic = -1.70), providing evidence of cost stickiness. The sum value of $B_1 + B_2$ =0.217 for young firms indicates that SG&A costs decrease only 0.22% for each 1% decrease in revenues. This result, that discretionary cost stickiness is higher for young firms, is consistent with the main result in Table 6 for firms in the introduction stage. Furthermore, the interaction term of *DEC*Δ*lnSALE* in Column (2) of Table 4-7 is significantly positive at $p<0.01$, supporting the proposition that mature firms show anti-stickiness behaviour which is consistent with the main results in Table 4-6.

Table 4-7 Cost stickiness in acquiring firms –alternative proxy measure of firm life cycle

Dependent variable:	**ΔIn SG&A**		
	(1)	**(2)**	**(3)**
	Young	**Mature**	**Old**
Δln*SALE*	**0.479*** **	**0.779*** **	**0.760*** **
	(40.95)	**(65.50)**	**(96.95)**
DEC*Δln*SALE	**-0.262***	**0.588*** **	**-0.236**
	(-1.70)	(3.34)	(-1.59)
Constant	0.031	0.131**	0.068
	(0.29)	(2.07)	(1.40)
Observations	3,480	3,479	6,995
Adjusted R-squared	0.577	0.700	0.702
YEAR	YES	YES	YES
INDUSTRY	YES	YES	YES
CONTROL	YES	YES	YES

Note: This table presents the regression results of cost of stickiness and M&A deals in the present of firm life cycle by using alternative proxy measure of firm life cycle. Variable definitions are in Appendix 4.1. Coefficient estimates are reported with *t*-statistics in parentheses. Statistical significance of the estimates is 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.

4.4.5 Cross-sectional anaylses

I conduct cross-sectional tests to examine the channels that could affect acquiring firms' cost stickiness behaviour at different firm life cycle stages. The channels include Big-4 audit firms, capital expenditure (CAPEX), and research and development (R&D).

4.4.5.1 Capital expenditure (CAPEX)

To examine the impact of capital expenditure on acquiring firm's cost stickiness at different stages of firm life cycle (H3a), I split the sample into high and low CAPEX subsamples based on the above-median and below-median CAPEX levels. The regression results are presented in Columns (1)-(10) of Table 4-8. The coefficients of the interaction variable *INTRO*×*DEC*Δ*lnSALE* in Columns (1) and (2) of Table 4-8 is significantly negative for introduction-stage acquiring firms with lower levels of *CAPEX* (at $p<0.01$), but is not significant for firms with high levels of *CAPEX*. This indicates that acquiring firms in the introduction stage with lower levels of *CAPEX,* exhibit higher cost stickiness behaviour in the introduction stage than do those with higher levels of *CAPEX.* Previous literature (Porter 1980, Spence 1981) argues that firms in the early life cycle stage should maximise revenue growth to produce permanent cost- or demand-advantages over competitors. In addition, firms at this stage can prevent entrance by building capacity and incurring large capital expenditures. Anthony and Ramesh (1992) show that firms with higher capital expenditure ratios (high growth rates) can achieve high levels of performance. Hence, introduction-stage firms with low *CAPEX* could

have lower performance and less investment opportunities, leading to higher cost stickiness behaviour.

The coefficient of the interaction variable $MATURITY \times DEC\Delta lnSALE$ in Columns (5) and (6) of Table 4-8 is significantly positive for maturity-stage acquiring firms with lower levels of *CAPEX* (at $p<0.10$), but is not significant for firms with higher levels of *CAPEX*. These findings indicate that acquiring firms with lower levels of *CAPEX* have anti-stickiness cost behaviour in the mature stage than those with higher levels of *CAPEX*. Firms in the mature stage have higher certainties regarding future cash flows and earnings, and have lower costs of resource adjustment (Gray and Ariss 1985). The continuous security in operational cash flows, income, investments and profit margins of mature firms may make these firms less susceptible to financial distress, potentially leading to anti-stickiness cost behaviour.

The coefficients of the interaction variables $GROWTH \times DEC\Delta lnSALE$ in Columns (3) and (4) of Table 4-8 are both significantly positive for acquiring firms in the growth stage, regardless of the level of capital expenditures. The results indicate that acquiring firms in the growth stage always have anti-stickiness cost behaviour. This is owing to their need to have a flexible costing strategy in order to cope with their growth. The results in Columns (9) and (10) of Table 4-8 indicate that acquirers in the decline stage have higher cost stickiness behaviour, regardless the level of *CAPEX*. In the decline stage, firms lose competitiveness and face high resistance to change (Porter 1980), resulting in higher cost stickiness.

Table 4-8 Acquiring firms' cost stickiness and firm life cycle - Moderating effect of CAPEX

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	ΔIn SG&A									
	High CAPEX	**Low CAPEX**	**High CAPEX**	**Low CAPEX**	**High CAPEX**	**Low CAPEX**	**High CAPEX**	**Low CAPEX**	**High CAPEX**	**Low CAPEX**
Δln *SALE*	0.578***	0.499***	0.585***	0.502***	0.582***	0.499***	0.585***	0.504***	0.585***	0.507***
	(77.53)	(42.86)	(79.96)	(43.39)	(79.10)	(42.91)	(79.82)	(43.54)	(79.95)	(43.92)
*DEC*Δln*SALE*	-0.505***	-0.186*	-0.562***	-0.363***	-0.526***	-0.332***	-0.506***	-0.336***	-0.528***	-0.317***
	(-3.10)	(-1.90)	(-3.53)	(-3.75)	(-3.22)	(-3.44)	(-3.16)	(-3.47)	(-3.34)	(-3.28)
INTRO	0.033***	0.019**								
	(4.60)	(2.35)								
INTRO×*DEC*Δln*SALE*	**-0.021**	**-0.229*** **								
	(-0.36)	**(-6.81)**								
GROWTH			0.010**	0.029***						
			(2.10)	(6.39)						
GROWTH×*DEC*Δln*SALE*			**0.199** **	**0.145*** **						
			(2.18)	**(3.42)**						
MATURITY					-0.025***	-0.017***				
					(-4.39)	(-3.66)				
MATURITY×*DEC*Δln*SALE*					**-0.008**	**0.138*** **				
					(-0.10)	**(3.60)**				
SHAKEOUT							-0.015	-0.007		
							(-1.47)	(-0.83)		
SHAKEOUT×*DEC*Δln*SALE*							**0.080**	**0.055**		
							(1.13)	**(1.54)**		
DECLINE									-0.021	-0.080***
									(-1.58)	(-7.17)
DECLINE×*DEC*Δln*SALE*									**-0.171** **	**-0.091*** **
									(-2.49)	**(-2.84)**
Constant	0.094	0.051	0.114*	0.053	0.126*	0.068	0.111*	0.062	0.113*	0.070
	(1.40)	(1.00)	(1.70)	(1.02)	(1.88)	(1.31)	(1.65)	(1.21)	(1.68)	(1.37)
Observations	7,066	6,888	7,066	6,888	7,066	6,888	7,061	6,888	7,066	6,888
Adjusted R-squared	0.639	0.446	0.638	0.443	0.638	0.443	0.638	0.440	0.638	0.444
YEAR & INDUSTRY FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROL	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Note: This table reports the moderation effect of capital expenditure. Variable definitions are in Appendix 4.1. Coefficient estimates are reported with *t*-statistics in parentheses. Statistical significance of the estimates is 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.

4.4.5.2 Research and development (R&D)

To examine the impact of R&D expenses on the cost stickiness behaviour of acquiring firms at different stages of the firm life cycle (H3b), I split the sample into high and low R&D subsamples based on the above-median and below-median R&D expenditure. The regression results are presented in Table 4-9[25]. The coefficient of the interaction variable $INTRO \times DEC\Delta lnSALE$ for firms in the introduction stage (Columns (1) and (2) of Table 4-9) is significantly negative for firms with higher levels of R&D (at $p<0.01$), but is not significant for firms having low levels of R&D. This indicates that acquiring firms with higher levels of R&D expenditures exhibit higher cost stickiness in the introduction stage than those with lower levels of R&D. Amir et al. (2007) argue that R&D investment has higher future uncertainty than tangible asset investment in industries with high R&D intensity, while there is no difference in industries with low R&D intensity. Firms in the introduction stage have higher risk and uncertainty, leading managers to generate more cost stickiness.

The coefficient of the interaction variable $MATURITY \times DEC\Delta lnSALE$ for firms in the mature stage (Columns (5) and (6) of Table 4-9) is significantly positive for firms with higher levels of R&D (at $p<0.01$), but is not significant for firms with lower levels of R&D. This indicates that acquiring firms with higher levels of R&D have more anti-stickiness cost behaviour in the mature stage than those with lower levels of R&D. Firms in the mature stage experience fierce competition, with stagnant sales, business growth, and have the benefits of innovation (Fellner 1951), increasing R&D expenditure. Therefore, mature firms may show anti-stickiness cost behaviour when they invest more in R&D expenses.

The coefficients of the interaction variables $GROWTH \times DEC\Delta lnSALE$ for firms in the growth stage (Columns (3) and (4) of Table 4-9) are significantly positive for acquiring firms with both high and low levels of R&D (at $p<0.1$). This implies that acquiring firms have anti-stickiness cost behaviour in the growth stage regardless of the level of R&D expenses. The coefficient of the interaction variables $DECLINE \times DEC\Delta lnSALE$ for firms in the decline stage (Columns (9) and (10) of Table 4-9) are significantly negative for acquiring firms with both high and low levels of R&D (at $p<0.1$). This shows that acquiring firms in the decline stage have higher cost stickiness behaviour regardless of the level of R&D expenditures.

[25] The *R&D Intensity* variable which is in the original model reported in Table 4, is no longer in the list of control variables of regression results in Table 10.

Table 4-9 Acquiring firms' cost stickiness and firm life cycle - Moderating effect of R&D

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					ΔIn SG&A					
	High R&D	Low R&D	High R&D	Low R&D	High R&D	Low R&D	High R&D	Low R&D	High R&D	Low R&D
Δln *SALE*	0.546***	0.634***	0.553***	0.643***	0.549***	0.639***	0.553***	0.643***	0.552***	0.643***
	(66.08)	(73.75)	(68.27)	(76.03)	(67.42)	(75.16)	(68.12)	(75.99)	(68.19)	(76.17)
*DEC*Δln*SALE*	-0.269**	-0.169	-0.354***	-0.304**	-0.363***	-0.301**	-0.342***	-0.289**	-0.310***	-0.319**
	(-2.32)	(-1.20)	(-3.04)	(-2.41)	(-3.11)	(-2.37)	(-2.94)	(-2.28)	(-2.68)	(-2.52)
INTRO	0.028***	0.042***								
	(3.75)	(5.50)								
INTRO×*DEC*Δln*SALE*	**-0.160*** **	**-0.078**								
	(-4.55)	**(-1.33)**								
GROWTH			0.025***	0.012***						
			(5.08)	(2.65)						
GROWTH×*DEC*Δln*SALE*			**0.134** **	**0.107***						
			(2.51)	**(1.70)**						
MATURITY					-0.023***	-0.022***				
					(-4.20)	(-4.27)				
MATURITY×*DEC*Δln*SALE*					**0.145*** **	**0.038**				
					(2.91)	**(0.68)**				
SHAKEOUT							-0.007	-0.024**		
							(-0.78)	(-2.18)		
SHAKEOUT×*DEC*Δln*SALE*							**0.068**	**0.008**		
							(1.51)	**(0.15)**		
DECLINE									-0.060***	-0.051***
									(-5.78)	(-3.01)
DECLINE×*DEC*Δln*SALE*									**-0.063***	**-0.202*** **
									(-1.83)	**(-2.84)**
Constant	-0.087	0.211***	-0.057	0.220***	-0.051	0.229***	-0.065	0.227***	-0.053	0.224***
	(-1.56)	(3.03)	(-1.02)	(3.16)	(-0.92)	(3.28)	(-1.16)	(3.26)	(-0.95)	(3.21)
Observations	6,977	6,977	6,977	6,977	6,977	6,977	6,975	6,974	6,977	6,977
Adjusted R-squared	0.617	0.617	0.616	0.616	0.616	0.616	0.614	0.616	0.616	0.616
YEAR & INDUSTRY FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
CONTROL	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

This table reports the moderation effect of R&D. Variable definitions are described in Appendix 4.1. Coefficient estimates are reported with *t*-statistics in parentheses. Statistical significance of the estimates is 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.

4.5 Conclusion

This study examines the cost stickiness behaviour of acquiring firms. I find that firms that participated in M&A activities have a lower level of cost stickiness compared with non-M&A firms. While acquiring firms in the introduction and decline stages have higher cost stickiness, they experience anti-stickiness cost behaviour in the growth, mature and shakeout stages of their corporate life cycle. In addition, this study explores three channels that have the potential to influence the cost stickiness of acquiring firms over their firm life cycle, namely, capital expenditures (high and low *CAPEX*), and *R&D* expenses (high and low R&D). This study finds that the high level of cost stickiness for acquiring firms in the introduction stage is observed only in firms with low *CAPEX* levels, and it is prevalent in the decline stage in firms with both high and low *CAPEX* levels. Although the anti-stickiness cost behaviour is found only in acquiring firms in the maturity stage with low *CAPEX,* it is consistent in the growth stage for all acquirers regardless of *CAPEX* levels. Finally, firms engaging in M&As with high *R&D* expenses have more cost stickiness in the introduction stage. However, the high level of cost stickiness for acquirers in the decline stage is persistent irrespective of *R&D* levels. Acquiring firms in the mature stage with higher R&D expenses exhibit anti-stickiness cost behaviour, but this difference is not observed for firms in the growth stage. This study provides insights into the factors that affect the acquiring firm's cost stickiness behaviour across their corporate life cycle.

4.6 Appendices

Appendix 4.1 Variable Definitions

Variable	Definition
$\Delta lnSG\&A$	The natural logarithm of the change in selling, general, and administrative (SG&A) costs of firm *i* in year *t* relative to year *t-1*.
$\Delta lnSALE$	The natural logarithm of the change in sales revenue of firm *i* in year *t* relative to year *t-1*.
DEC	Equals 1 if sales revenue of firm *i* decreased between year *t* and year *t-1*, 0 otherwise.
$DEC\Delta lnSALE$	Interaction term between DEC and $\Delta \ln SALE$.
Assets Intensity	The natural logarithm of the ratio of total assets to sales revenue at time *t*.
EMPLOYMENT	The natural logarithm of the ratio of the number of employee to sales revenue at time *t*.
SECC DEC	Successive decrease is an indicator variable that takes the value of one if sales revenues in year *t-1* are less than those in year *t-2,* and zero otherwise (Chen et al. 2012).
SIZE	Firm size is measured by the natural logarithm of total assets.
R&D Intensity	Research and Development (R&D) Intensity is calculated as the ratio of the total R&D expenses to sales revenue.
LEV	Firm leverage, measured as long-term and short-term debt divided by total assets.
PPE DEC	Property, Plant and Equipment (PPE) decrease is measured when gross PPE decreases between periods *t-1* and *t*.
GM	Gross margin is the difference between the ratio of gross profit to sales at year *t-1* and that at year *t*.
ROE	Return on equity, measured as net income before extraordinary items divided by total assets at year *t*.

Firm life cycle

I used the Dickinson (2011) model for firm life cycle. The sample firms are classified into different life cycle stages on the basis of the following cash flow patterns:

INTRO	Firms are classified in the Introduction stage if OPCF < 0, INCF < 0 and FCF > 0
GROWTH	Firms are classified in the Growth stage if OPCF > 0, INCF < 0 and FCF > 0
MATURE	Firms are classified in the Mature stage, if OPCF > 0, INCF < 0 and FCF < 0
DECLINE	Firms are classified in the Decline stage, if OPCF < 0, INCF > 0 and FCF </ > 0
SHAKEOUT	The remaining firms are considered to be in the shakeout stage
where:	
OPCF	Cash flows from operations
INCF	Cash flows from investment
FCF	Financing cash flows

I also used the retained earnings to total assets (RE/TA) as an alternative proxy for firm life cycle (DeAngelo et al. 2006).

Young	Young firms if they are in the bottom one-third of the RE/TA cohort.
Mature	Mature firms if they are in the middle one-third of the RE/TA cohort.
Old	Old firms if they are in the top one-third of the RE/TA cohort.

Proxies of channels

Variable	Definition
CAPEX	The natural logarithm of the change in capital expenditures of firm *i* in year *t* relative to year *t-1*. High or low CAPEX is ranked as above or below the median of the sample.
R&D	R&D ratio, measured as R&D expenses divided by total assets of firm *i* in year *t*. High or low R&D is ranked as above or below the median of the sample.

Chapter Five

5

Conclusion

5.1 Introduction

This thesis examines several of important questions that been comprises in three essays. The first essay (Chapter 2) examines the association between M&A activities and tax avoidance. The second essay (Chapter 3) investigates the effects of financial restatement on the relationship between M&A activities and audit fees. The third essay (Chapter 4) examines whether there is any difference in the asymmetric cost behaviour between M&A firms and non-M&A firms. It also investigates if the cost stickiness behaviour of acquiring firms varies across different stages of life cycle development.

5.2 Summary of Major Findings

The first essay examines the relationship between corporate tax avoidance and M&A activities. The findings indicates that there is a negative association between M&A deals and CASH ETR, suggesting that firms participating in M&A transactions have higher levels of tax avoidance in the current and subsequent one year after M&A deals. It is also found that firms do not participate in any tax avoidance strategies in the year preceding and the second year following M&As. Furthermore, previous to the IRS Repurchase Legislation (IRS 2007–48), acquiring corporations have a greater percentage of corporate tax avoidance. This association is moderated by agency costs, managerial diversion and audit pricing. It is found that the positive relationship between M&As and tax avoidance is further increased in firms with high agency costs, high managerial diversion and high audit pricing. This study provides a deeper understanding of the elements that influence the strength of the association between M&A transactions and tax avoidance. It also adopts alternative measures of corporate tax avoidance and any potential endogeneity issues that might affect the main results through employment of propensity score matching (PSM) and the Heckman's selection bias. This essay makes several key contributions. First, this study examines the business effective tax rates in the years around the M&A announcement year to give a complete examination of the link between M&A agreements and corporate tax avoidance. This essay finds that corporations engage in tax avoidance in the current year and one year after M&A transactions, but not in the year before or two years after M&As, indicating that M&A deals are one of the main methods contributing to tax avoidance. Second, this essay shows that laws might possibly prohibit corporations from engaging in tax avoidance. Results indicate that after the enactment of the IRS Repurchase Legislation (IRS 2007–48), acquiring corporations participated in reduced tax avoidance. Third, this essay provides an inclusive analysis of the association between corporate tax avoidance and M&As by examining different channels that might possibly affect that association. This essay investigates the effect of agency costs, managerial diversion and audit pricing on the positive association between M&As and corporate tax avoidance. It is found that the association between corporate tax avoidance and M&A

activity is stronger in firms with higher agency costs, higher managerial diversion and higher audit pricing. Fourth, this study adds to the literature on corporate tax avoidance as well as that on M&As. This essay answers the call from Hanlon and Heitzman (2010) appealing for greater research on the implications of tax avoidance among enterprises that have engaged in M&A activity. There are several theories in this essay to describe managers' behaviour in making M&A choices (managerial power theory vs incentive alignment theory), and in implementing aggressive tax-avoidance techniques (agency theory vs neoclassical view of tax management). The findings of this study will be useful to regulators and tax authorities.

The second essay examines the association between audit fees and the occurrence of M&A deals. Audit fees are greater for firms that participate in M&A deals. It is also found that these companies did not incur high audit fees one year prior to engaging in M&A deals, but they did incur higher audit fees in the current year and one year after takeover announcements. Acquiring businesses with financial restatements are reported to have higher audit fees. Furthermore, acquiring firms that have specific types of restatements, such as restatements related to accounting rule application failures, restatements that have adverse effects on a firm's financial statement (financial statement materiality), or restatements related to errors in accounting and clerical applications, are charged higher audit fees. This study further examines the channels that could possibly affect the association of M&As, restatements and audit fees, namely, strength of the internal control material weaknesses (ICMW) restructures, the level of audit quality (Big4 or non-Big4 auditors), geographic location of audit offices, and agency effects. The findings indicate that the positive relationship between audit fees and acquiring firms having restatements is greater in firms with reported ICMWs, in firms that employ non-Big4 audit firms, firms have a geographic location different from that of their auditors and firms with high agency costs. This essay provides more understanding into the factors that affect the strength of the association between audit fees and acquiring firms having restatements. This study addresses any potential endogeneity issues that might be affected by omitted variable bias, model misspecification or reverse causality the main results by employing propensity score matching (PSM), the Heckman test and a difference-in-difference (DID) tests. This essay makes an important contribution to the literature in various respects. Prior research (Firth 2002, Fields et al. 2004) indicates that audit effort is likely to rise following mergers and acquisitions. This study, however, did not look into the routes via which this connection may potentially act. In a variety of ways, this study extends and contributes considerably to previous research in this field. First, this essay look at audit prices in organisations that have made acquisitions both before and after the announcement of the acquisition. It is found that the year of acquisition and one year after the occurrence of an M&A deal are observed to have increased audit fees for acquiring firms, but not in the year prior to a takeover announcement. These findings show that mergers and acquisitions are likely to result in

increased audit fees. Second, this study looks into how financial restatements could affect audit fees imposed on acquiring companies. The findings demonstrate that companies that engaged in M&A activity and had financial restatements pay much higher audit fees. Restatements are separated into different categories such as restatements due to accounting rule application failures, restatements related to an adverse effect on the financial statement (financial statement materiality), and restatements related to mistakes in accounting and clerical applications are the primary drivers of this association. This study answers the call from (Hay et al. 2006, DeFond and Zhang 2014, Habib et al. 2020) to investigate the influence of audit fees in firms engaging in M&A activities, given that these activities are expected to have ramifications for governance, internal control, transparency, and business risk (Gaver and Paterson 2007). Third, this study builds on the work of Habib et al. (2020) by investigating the channels that could potentially affect the relationship between audit fees, M&A deals and financial restatements. These channels include strength of internal control material weaknesses (ICMW), level of audit quality (Big4 or non-Big4), geographical location of audit offices, and agency costs. Audit fees in acquiring companies with financial restatements are greater in firms with internal control material weaknesses, in firms that employ non-Big4 auditors, in firms located in a city (state) different from that of their auditors and in firms with higher agency costs. Furthermore, the results of this essay will be important to a variety of stakeholders. Given that M&As entail asset and liability revaluation, new assets valuation, and efficiency and risk evaluations related to business unit integration, the findings will be of interest to investors, analysts, financial controllers, and regulators. Analysts will be particularly interested in the chances of successful post-acquisition integration and continuity of company activities. Inefficiencies in achieving operational synergies, as well as increased complexity and uncertainty associated with integration, are likely to represent greater operational risks and, as a result, higher audit fees. This may also be reflected in the increased prevalence of financial restatements and the need to recast substantial shortcomings. Furthermore, auditors will be interested in mapping the audit pricing-M&A relationship before, during, and after an M&A occurrence because auditors act as information repositories for their clients, and thus the continuity and interpretation of that information will be important to them as firms transition through M&A activities.

The third essay reports the examination of the cost stickiness behaviour of acquiring firms. This essay explores whether firms engaged in M&As have lower levels of cost stickiness than non-M&A firms. While acquiring companies' exhibit increased the level of cost stickiness in the introduction and decline stages of their corporate life cycle, they exhibit anti-stickiness cost behaviour in the growth, mature, and shakeout stages. Furthermore, this essay investigates three channels that can potentially impact the cost stickiness of acquiring organisations during their life cycle, namely capital expenditures (high and low CAPEX), and R&D expenses (high and low R&D). The findings

indicate that the high level of cost stickiness for acquiring firms in the introduction stage is further increased in firms with low levels of CAPEX and firms with high R&D expenses. However, in the mature stage, the anti-stickiness cost behaviour is found only in acquiring firms with low CAPEX and firms with higher R&D expenses. This essay sheds light on the elements that influence acquiring firms' cost stickiness behaviour across their corporate life cycle. The results of this study are robust across a series of endogeneity and selection bias tests including propensity score matching (PSM), generalised method of moments (GMM) and difference-in-difference (DID). This study contributes to the literature in a variety of ways. To my knowledge, this is the first study to indicate that businesses engaged in M&A activities exhibit lower levels of cost stickiness behaviour than firms not engaged in M&As. This study responds to the call from (Anderson et al. 2016) to study cost behaviour under various conditions, such as those associated with M&A activity. Second using the Dickinson (2011) and DeAngelo et al. (2006) models, this study analyses the cost stickiness behaviour of acquiring enterprises over their life cycle stages. According to the findings, acquiring firms exhibit higher levels of cost stickiness in the introduction and decline phases, but anti-stickiness cost behaviour in the growth and mature stages. In this respects, this study responds to Habib and Hasan (2019)’s call by analysing how acquirers' cost stickiness evolves over the firms life cycle. Third, this study adds to the literature on firm cost behaviour, mergers and acquisitions, and corporate life cycle development by analysing three mechanisms that might possibly influence acquiring businesses' cost stickiness behaviour at different stages of the firm life cycle. High and low capital expenditures, and high and low R&D expenditures are all studied as potential channels that may influence this association. As a result, this essay provides a more nuanced study of the factors that may enhance the amount of cost stickiness in businesses that participate in M&A operations at various points of the firm's life cycle.

5.3 Directions for Future Research

The findings from this thesis provide insights and a framework for key stakeholders, including academics, regulators and shareholders. The findings contribute to an understanding of the M&A activities, tax avoidance, audit pricing and asymmetric cost behaviour. Firstly, this thesis shows that there is a positive relationship between corporate tax avoidance and firms engaging in M&A activities. The Tax Cuts and Jobs Act (TCJA), enacted by President Donald Trump in January 2018, reduced the corporate tax rate from 35% to 21%. In 2021, President Joe Biden suggested raising the corporate income tax rate from 21% to 28%. One specific purpose of the Biden proposal is to discourage US firms from relocating intangible assets and corresponding income to controlled subsidiaries in countries with lower tax rates as compared to that of the US. It is well-known that political economic developments can have an influence on a firm's tax avoidance. Future research on the impact of political economics events on the decision of engaging to more M&A activities and how these events could affect tax avoidance.

Findings reported in the second essay show that firms engaging in M&A activities and having financial restatements incur significantly higher audit fees. This essay divided financial restatements into different types and examines four channels that moderated the association of financial restatement and audit fees for acquiring firms. As the regulation and implementation of Generally Accepted Accounting Principles (GAAP) for state and local federal government sectors are different from those in private sectors, future research may be focus on the private sector as the audit regulations is different to the public sector. Additionally, the second essay demonstrates that different states and cities between auditors and clients increase audit pricing for firms engaging in M&A deals. Future studies may focus on different regulations between states and how this effects M&A activities and whether there is any variation of issuing financial restatement among state level.

All of the three essays explore channels that moderate the association for each essay. Future research can focus on exploring more channels affecting the association of M&A activities on tax avoidance, audit pricing or asymmetric cost behaviour. The three essays in this thesis focus on the acquiring firms and how they act and react with different events during the M&A activities. Future research may focus on the target firms and take different events that mention from the target perspective. Furthermore, the period under examination in this thesis finishes in 2019 and it did not cover an important events such as COVID-19 which started in 2020 and the increasing value of M&A activities that occurred in 2021. Therefore, future studies could examine the effect of M&A on tax avoidance, audit pricing and asymmetric cost behaviour before and during the COVID-19 period.

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