Adoption of FRS 102 – Evidence from UK SMEs

This Thesis is Submitted for the Degree of Doctor of Philosophy in Accounting and Financial Management

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Declaration

I confirm that this is my own work and the use of all material from other sources has been properly and fully acknowledged.

Omar Arabiat   **Date: 28/08/2021**

Dedication

To my parents

To my lovely siblings

To my friendly friends

To my unknown future wife

To myself….

Abstract

Under IASB's initiatives of developing International Financial Reporting Standards (IFRS) for Small and Medium-sized Entities (SMEs), UK has played an important role in this by rolling out the new UK GAAP – FRS 102 *The Financial Reporting Standard applicable in the UK and Republic of Ireland* (FRS 102 thereafter). It's widely acknowledged that FRS 102 is broadly based on the IFRS for SMEs. This research sets out to examine the determinants and consequences of FRS 102 adoption by UK SMEs, with a manually collected dataset of UK SMEs from 2009 to 2019. This PhD thesis consists of three empirical papers. *The first paper* focuses on the factors driving the UK SMEs towards adopting FRS 102. Our results show that SMEs with a higher level of leverage are less likely to adopt FRS 102, suggesting that SMEs with a higher level of long-term debt would have already established their private communication channel with the creditors, and their financial reports are less relied upon by the creditors. Further, the adoption of FRS 102 is significantly associated with firms' growth prospect, audit quality, and industry classifications. *The second paper* examines the impact of FRS 102 on financial reporting quality, and also on the relationship between earnings management and leverage. We find that the adoption of FRS 102 by UK SMEs increases the quality of their financial statements. Further, before FRS 102 adoption, SMEs' managers seek to manipulate earnings to avoid the prospect of violating debt covenants, while the adoption of FRS 102 has facilitated more intense monitoring from creditors. *The third paper* investigates the moderating impact of FRS 102 adoption on the relationship between trade credit and bank credit. Our results show that bank finance substitutes trade credit received, where FRS 102 adoption has weakened this relationship. This suggests that the adoption of FRS 102 has facilitated better financial information disclosure and alleviated the level of information asymmetry, and consequently, creditors such as banks would be better at assessing the financial risk associated with lending to the UK SMEs. To some extent, the adoption of FRS 102 has attracted more intense monitoring from the creditors. Further, despite that UK SMEs play the role of financial intermediaries by financing their sales activities via extending short-term bank credit to their customers, as recipients of trade credit, their customers would be indifferent to whether the UK SMEs adopted FRS 102 or not.

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List of Abbreviations

ABS	Australian Bureau of Statistics
ACCA	Association of Chartered Certified Accountants
AICPA	American Institute of Certified Public Accountants
AWCA	Abnormal Working Capital Accrual
DID	Difference-in-Differences
EC	European Commission
EFAA	European Federation of Accountants and Auditors
EFRAG	European Financial Reporting Advisory Group
EM	Earning Management
EU	European Union
FRC	Financial Reporting Council
FRS	Financial Reporting Standard
FRSSE	Financial reporting standard for smaller entities
GDP	Gross domestic product
IAS	International Accounting Standards
IASB	International Accounting Standards Board
IASC	International Accounting Standards Committee
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
KSBS	Key Small Business Statistics
OECD	Organisation for Economic Co-operation and Development
PAT	Positive Accounting Theory

PWC	Price Waterhouse Cooper
RAM	Real Activities Manipulation
SBA	Small Business Administration
SEC	Security Exchange Commission
SIC	Standard Industrial Classification
SME	Small and medium-sized enterprises
UK GAAP	UK Generally Accepted Accounting Principles
UNCTAD	United Nations Conference on Trade and Development
VIF	Variance of Inflation
WB	World Bank
WBES	World Business Enterprise Survey

Chapter 1 Introduction

1. Introduction

The private sector is regarded as one of the most remarkable drivers of economic growth, in terms of its improvement to production and employment as well as its contribution to the formation and development of economies (Klapper, Sarria-Allende and Sulla, 2002; Francis, et al., 2008; OECD, 2016). SMEs, as a very special subset of private firms (OECD, 2016) employ more than half of the workforce in the private sector (OECD, 2014) and constitute 99% of all business in the EU (EC, 2003), and more than 99% of the UK's firms (Rhodes, 2019). Despite their importance, our understanding of the accounting role and operations played in these firms is still limited (Francis, et al., 2008). To illustrate, private firms, compared to listed firms, may not have any incentive to prepare high-quality reports (Ball and Shivakumar, 2005; Katz, 2006), due to the presence of special (i.e., private) channels in their communication with creditors and, in this case, the accounting policy choices may not be important for these companies (Zarzesk, 1996; Ball and Shivakumar, 2005). Conversely, Francis, et al. (2008) suggest that private/SMEs entities have contractual motives to enhance financial reporting' quality via voluntary implementation of accounting standards. This research is contemporary with recent developments of accounting standards for SMEs. Thus, highlighting these firms will enhance our understanding of the contractual environment and their accounting options. Moreover, studying private firms, compared to listed companies, will shed light on market imperfections in terms of information asymmetry and agency conflict, as private firms lack transparency in their financial reports, which can lead to problems with external parties (Francis, et al., 2008). Hence, this study focuses on SMEs and its accounting standards.

In 2015, the Financial Reporting Council (FRC) issued the FRS 102 *The Financial Reporting Standard applicable in the UK and Republic of Ireland*, which includes new requirements for small entities (FRC FRS 102, 2015). This gives an interesting setting to focus on SMEs in the

UK as a fertile and effective environment for actualizing and implementing new accounting standards, especially for SMEs. The application of FRS 102 by SMEs (i.e., the study sample) was voluntary during the study period. As a result, it is desirable to comprehend the economic trade-offs that these enterprises encounter in voluntarily choosing between different accountings policies. This is also expected to give insights for constituents (i.e., policymakers, standards setters, preparers, users, and regulators) to constitute an initial image of the FRS 102 adoption from the lens of SMEs in the UK. This will contribute to further recognizing the economic cost and benefits that SMEs encounter in selecting FRS 102 among the various accounting policies. It is also possible for standards-setters, policymakers and regulators to take advantage of the arguments and results of this study about the process of movement from switching to FRS 102. In addition, it could be valuable to add insights to the IASB theoretical framework, as the new UK GAAP 'FRS 102' are exclusive and a new subject was recently issued by FRC, as a prescribed body, and the fact that the effect of applying these standards is still somewhat ambiguous means that it could be a topic of high value to the FRC and IASB.

Cost and benefit are necessary to assess accounting standards (Sellhorn and Gornik-Tomaszewski, 2006; Nobes, 2010). Thus, this study is expected to contribute to a better understanding of the implications of the new standards because it is a new option for SME managers rather than the old criteria option, especially given that FRS 102 brought significant changes to various scopes such as financial instruments, which could affect the estimation and valuation options for assets and liabilities, which in turn affect the reporting of financial position and contracting environments. Moreover, the decision regarding the process of transition to new standards in terms of cost and benefit gives decision makers the ability to make a rational decision by providing them with well-structured theoretical model and results. Hence, this could provide valuable insights for the judgment and decision-making process.

This chapter is organized as follows. Section 1.1 presents the research background by highlighting the development of the accounting standards for SMEs and their application in the UK. Section 1.2 addresses the research aims and objectives. Section 1.3 outlines the research philosophy. Section 1.4 briefly discusses the research methods. Section 1.5 provides an overview of the research gap and contribution. Section 1.6 presents the summary of the key findings. Section 1.7 identifies the thesis structure.

1.1 Research Background

Since 1998, the International Accounting Standards Committee (IASC) has had a futuristic view, where the committee commended the fact that international accounting standards should contribute significantly to improving the corporate disclosure in terms of comparability and quality (IASC, 1998). The International Accounting Standard Board (IASB) believes that, to maintain the consistency in the IASB's conceptual framework and to meet the users' needs as well as ensuring the comparability, the concerned of small and medium sized-entities (SMEs) regulation should not be left to other regulators (Evans, et al., 2005). Therefore, the IASB was keen to create and develop a single set of international accounting standards that are characterized by many qualities: high quality, understandable and, most importantly, enforceable. The Board additionally commended its insight to work with local standard setters to achieve the goal of convergence (Pacter, 2005, p.71; Van der Meulen, Gaeremynck and Willekens, 2007). Prior to 2009 and especially prior to the introduction of the International Financial Reporting Standards (IFRS) for SMEs; SMEs that were not subject to public accountability were either following the Generally Accepted Accounting Principles (GAAP) or IFRS in compliance with the laws of individual jurisdictions (Tyrrall, Woodward and Rakhimekova, 2007; Alp and Ustundag, 2009). Therefore, there was a crucial need to develop an appropriate conceptual framework that gives high importance to the comparative accounting information given by SMEs. Thus, the adoption of the International Financial Reporting

Standards (IFRS) for SMEs has come to raise the financial reporting comparability of companies that do not apply IFRS, and this might be considered as a possible solution in the EU (Albu, et al., 2013). Accordingly, the IASB decided to add the IFRS for SMEs on its own agenda as a result of the pressures that have been faced by the external parties (Ram and Newberry, 2013, p.4). Following that stage, on 9 July 2009, the IASB issued the IFRS for SMEs as a result of the solid global request from both developed and developing economies to include new specific requirements for SMEs (Jermakowicz and Epstein, 2010), and to create a simplified version of the IFRS, with a measurable reduction in the disclosure requirements and measurement principles (IASB 2009; Perera and Chand, 2015).

SMEs are the backbone of any market economy as they constitute the vast majority of firms (Evans, et al., 2005; Siam and Rahahleh, 2010; Maseko and Manyani, 2011; Hope, Thomas and Vyas, 2013; Kaya and Koch, 2015); however, there is an inadequate understanding of accounting issues faced by these entities (Francis, et al., 2008). Although the IASB issued the IFRS for SMEs to primarily meet the needs of users of financial statements for small and medium-sized enterprises also to ease the financial reporting burden on SMEs, it appears that the IASB was unable to identify the target beyond these standards (Ram and Newberry, 2013) for several reasons. Firstly, although the users' roles of IFRS for SMEs are very important as they are the real users of these standards, it has been observed that the IASB consultation processes on IFRS for SMEs does not include a significant role for those users (Quagli and Paoloni, 2012). Secondly, "moves for differential reporting are frequently driven by other groups than users, such as practitioners and academics" (Evans, et al., 2005, p.38). Thirdly, it was noted that users are less dynamic than the preparers, especially in the consultation processes (Ram and Newberry, 2013; Quagli and Paoloni, 2012). Fourthly, it has been asserted that users incorporated into the consultation process are not representative of SMEs (Ram and Newberry, 2013).

Overall, the trend towards IFRS for SMEs remains controversial as a result of the difference in the degree of application of these standards by nations (Ram and Newberry, 2013). In Europe, for illustration, the choice to implement IFRS for SMEs at the supranational level was refused by the European Commission (EC, hereafter), which left the choice to EU member states (Kaya and Koch, 2015). Thus, with the trend towards IFRS for SMEs still controversial, different nations resort to various endeavours to converge. The UK has always played an active role in finding realistic solutions for both public interest, company size, information needs and the company complexity through revising and updating the old standards 'Old UK GAAP' by issuing new set of standards named 'The new UK GAAP'. FRS 102 is the core among the new UK GAAP standards, which is largely based on the IFRS for SMEs, as it includes new requirements for small entities with the aim at diminishing the intricacy and cost for SMEs, while presenting a coherent and concise set of guidelines and standards to empower the financial statement users' of receiving a financial reporting featured with a high quality and comprehensibility that is suitable for the company size, its complexity as well as the information needs of users. Accounting periods starting from 1st January 2015 or afterwards are the period where entities shall start complying with the FRS 102, with early implementation permitted since or after 31 December 2012 (FRC FRS 102, 2015).

1.2 Aims and objectives

The main aim of this thesis is to examine the determinants (i.e., incentives) and consequences of FRS 102 adoption from the lens of SMEs in the UK. To achieve this aim, three papers have been developed with different objectives. The first paper examines the SMEs' incentives to adopt FRS 102. The second and third papers examine the consequences of FRS 102 adoption; the second paper mainly examines the impact of FRS 102 adoption on the quality of financial reporting. Further, the moderating impact of FRS 102 adoption on the relationship between

earnings management and leverage. The third paper mainly examines the impact of FRS 102 adoption on the relationship between bank credit and trade credit.

To achieve the papers' objectives, different theories have been reviewed after conducting an extensive and comprehensive reading for the prior studies on accounting standards for SMEs and for private firms. The researcher relies on various theories such as agency theory, signalling theory, the positive accounting theory's hypotheses (i.e., debt covenant violation hypothesis), the hypothesis of agency theory (i.e., control hypothesis), and financing advantage and transaction cost theories to answer the research questions. In order to examine the theories, the research design process came first. The research design includes several steps that are dealt with, in detail and separately, in each paper, but the initial steps in the research design for all paper are as follows. First, the definitions of SMEs globally are critically reviewed. However, since FRS 102 is applicable in the UK (FRC FRS 102, 2015), the European Commission's (EC) definitions were the core interest. After reviewing the definitions of the EC, it has been found that there are two main definitions of SMEs. The first one was published in 2003 (EC, 2003) and the second one was launched in 2015 (EC, 2015). Hence, it has been concluded that there is no unified definition for SMEs in the UK. Accordingly, the study sample was identified based on a similar logic used by Francis, et al. (2008). Second, the period from 2009 to 2019 was determined to be the study sample period. The year 2009 was chosen as the FRS 102 is based on the IFRS for SMEs that were issued in 2009 and have not been applied in the UK (Kaya and Koch, 2015). Thus, considering this period will give us an image about the proxy of the IFRS for SMEs in the UK. The year 2019 was chosen as it is the last available year in the database.[1] Third, the annual reports for SMEs included in the study sample have been collected manually from the FAME database to identify the accounting standards applied by SMEs

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[1] Not all companies have data available in 2019, some of which were available in 2018 and 2017. This confirms that the structure of the data is unbalanced panel.

included in the study sample and to investigate the year of adoption of FRS 102 for each entity. Further, the study data was collected from the same data base. Fourth, the researcher noted that the application of FRS 102 by SMEs is not mandatory, meaning that not all companies applied in one year, but applied in different years, for example, most firms implemented FRS 102in 2015, another group applied it in 2016, and another group applied it in 2017, and this, in turn, requires a statistical model that fits with this phenomenon. Accordingly, the researcher read many articles in several fields to find out what is the optimal model that will fit with this phenomenon, and which will be used to achieve accurate results for the three papers. The models applied in this research will be briefly addressed later on in this chapter and will be explained in detail in each paper.[2] The next section shows the research philosophy that was the basis for this research.

1.3 Research Philosophy

After a considerable review of the literature and theoretical frameworks, the methodology was formed. To answer all of the papers' questions, the positivist approach was employed which used a quantitative methodology.

Researchers must have the capability to articulate and recognize assumptions about the nature of reality, what can be known about it, and how to begin to arrive at that knowledge. These are the features of research paradigms. "A paradigm is a basic belief system and theoretical framework with assumptions about 1) ontology; 2) epistemology; 3) methodology and 4) methods. In other words, it is our way of understanding the reality of the world and studying it" (Rehman and Alharthi, 2016. P.51).

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[2] Special thanks goes to Clyde Schechter, Richard Williams, Stephen Jenkins and Jeff Wooldridge for their statistical guidance on the paper's statistical models and code development on STATA.

"***Ontology*** refers to the researcher's view of the nature of reality or being. ***Epistemology*** refers to the researcher's view of what constitutes accepTable knowledge" (Saunders, Lewis and Thornhill, 2009. p.119). "***Methodology*** refers to the theory of how research should be undertaken, while the term ***methods*** refer to the techniques and procedures used to obtain and analyze data" (ibid, p.3). The researcher's ontological and epistemological views generally demonstrate the research philosophy and the determining paradigm to be addressed (Scotland, 2012). There are various paradigms that are generally applied in business research such as positivism, interpretivism, and pragmatism (Creswell, 2009; Saunders, Lewis and Thornhill, 2009).

Positivism

Positivist methodology is aimed at demonstrating relationships (Scotland, 2012), and presumes that reality endures independently of individuals. Positivists seek to understand the social world as the natural world. In nature, there is a casual (i.e., cause-effect) link between events and, once formed, can be anticipated with confidence in subsequent years. For positivists, the same is true of the social world. Since reality is devoid of context, various researchers engaging in various eras and places will converge to the same outcomes about a particular event (Rehman and Alharthi, 2016). Positivists aim to test a theory or describe an experience "through observation and measurement in order to predict and control forces that surround us" (O'Leary, 2004, p.5). Thus, positivists undertake the deductive approach (Scotland, 2012), which begins with relevant theory-driven interpretations and guesses of social circumstances; it demands compliance with plausible reasoning, proper measurements, and neutrality in observation and analysis. Further, the positivist methodology requires highly structured large samples for data collection technique, utilizing the quantitative methods which includes empirical testing and statistical techniques to test hypotheses (Saunders, Lewis and Thornhill, 2009).

Interpretivism

Interpretivism contrasts with positivism. Interpretive forms of research maintain the position that our awareness of reality is a communal construct by individual performers. In this regard, value-free data cannot be attained, because the investigator has his preconceived notions to manage the investigation process (Walsham, 1995). Interpretivism considers variations such as circumstances, cultures and times contributing to improving various communal phenomena. Interpretivism is distinct from positivism because it proposes to have abundance in the ideas collected instead of pursuing to produce precise and global laws that can be generalized and can be relevant to everybody regardless of some key variables and aspects (Alharahsheh and Pius, 2020). Interpretivists normally use qualitative approach to research (i.e., methodology) (Potrac, Jones and Nelson, 2014). Hence, the inductive approach is generally used in this context (Saunders, Lewis and Thornhill, 2009), which considers forming an obvious relation between the findings developed from the raw data and the objectives of the research, and principally undertakes a systematic approach to analyse qualitative data that can yield valid and reliable findings (Thomas, 2006) and does not use theory-guided analysis (Collis and Hussey, 2014).

Pragmatism

Pragmatism is related to change, procedure and the interplay between action and knowledge (Goldkuhl, 2012). The pragmatic model is seen to undertake social research in a different manner that integrates the utilization of various approaches: quantitative, qualitative or mixed methods (Morgan, 2007; Feilzer, 2010). Pragmatism suggests that a research question is the most essential element of established research philosophy, claiming that it is probable to work in both interpretivist and positivist situations. It involves a hands-on approach, combining various viewpoints to help gather and explain data (Saunders, Lewis and Thornhill, 2009). Pragmatism supports the usage of various research approaches and that a regular rhythm of

deductive, inductive and, when relevant, abductive reasoning provides appropriate knowledge and also serves as a reason for rigid research (Mitchell, 2018). In an abductive reasoning approach, the process involves drawing an explanation from a given set of data, developing hypotheses or theory, and then validating these assumptions via additional tests to explain the data (Velázquez-Quesada, Soler-Toscano and Nepomuceno-Fernández, 2013; Walton, 2014). Overall, pragmatism focuses on both the 'how' and 'why' of the study problem and serves as the guiding philosophical scheme for mixed-methods research (Tashakkori and Teddlie, 2003; Somekh and Lewin, 2005; Mackenzie and Knipe, 2006).

In this research, for all of the three papers, the positivist paradigm and the deductive approach have utilised. The first paper, based on the hypothetical predictions of various theories such as agency theory and signalling theory, is concerned with answering the main factors that drive SMEs to adopt the FRS 102 standard. The second and third paper studies the consequences of FRS 102 adoption, based on several theories, the agency theory, the positive accounting theory's hypotheses (i.e., debt covenant and control hypotheses), and financing advantage and transaction cost theories. It is clear from the objectives of the three papers that the phenomenon is presumed to be objectively measurable, as we are interested in studying the relationships between variables which requires obtaining their data from the financial statements in the FAME database to achieve the purposes of the study (i.e., theory-driven test of relationships), as well as manually reading the financial reports to determine the general adoption of FRS 102; this in turn requires the use of a positive stance, in contrast to other methods that require qualitative methods or a combination of qualitative and quantitative methods.

In line with the research philosophy, the section below is a summary of the research design section. The goal of presenting it in this chapter is to provide a brief overview of the research methods that will be used in this research; they are discussed in detail in each individual paper.

1.4 Research Methods

The quantitative method will be used in this study to serve the study purposes. An unbalanced panel sample of SMEs in the UK for the period 2009-2019 is used and data is manually collected from the FAME database. Different types of analysis techniques have been utilized to fit the study purpose.

UK Context

In the context of the application of IFRS for SMEs being controversial and varied among countries, numerous states such as the UK, Australia, and the European Union member states, which are supporters of full IFRS, are yet to apply the IFRS for SMEs, as they still face challenges and difficulties in implementing these standards (Perera and Chand, 2015). However, with the trend towards IFRS for SMEs remaining controversial, different nations resort to varied endeavours to converge. The UK has always played an active role in this. In 2015, the Financial Reporting Council (FRC) rolled out the new UK GAAP, among which FRS 102 was adapted from the IFRS for SMEs (FRC, 2015).[3] FRS 102 is applicable in the UK as a fertile and effective environment for actualizing and implementing new accounting standards, especially for SMEs, and this makes the UK an interesting choice to consider in this study, which in turn will provide us with evidence on the cost and benefits of the adoption of IFRS for SMEs from the UK's perspective. Further, FRS 102 issued recently, in 2015, with early implementation permitted and it could be applied before 2015 in the UK (FRC FRS 102, 2015). IFRS for SMEs were issued in 2009 (Jermakowicz and Epstein, 2010), and FRS 102 is based on the IFRS for SMEs. This, therefore, makes the UK SMEs a compelling case study for examining and observing the event of FRS 102 adoption for the period 2009-2019.

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[3] FRS 102 is a single coherent financial reporting standard replacing old UK GAAP. Derived from the IFRS for SMEs, the FRC has made significant modification to address company law requirements and incorporate additional accounting options. FRS102 is applicable to unlisted or listed individual business, as well as unlisted groups in the UK. Essentially, it is applicable to UK entities that do not comply with the full IFRS (see https://www.iasplus.com/en-gb/standards/uk-gaap/frs102)

Additionally, UK SMEs constitute more than 99% of business in the UK (Rhodes, 2019), confirming that these entities are a key driver of economic growth. Consequently, studying UK SMEs, focusing in particular the period after their financial reports became available to the public, will contribute to increasing our understanding of SMEs' accounting choices.

Time Frame

The official launch of FRS 102 was in 2015, with early implementation permitted. However, FRS 102 is largely based on the IFRS for SMEs (FRC FRS 102, 2015), where IFRS for SMEs was issued in 2009 (Jermakowicz and Epstein, 2010). Hence, the research period is set to be from 2009 to 2019. Accordingly, the researcher started collecting the annual reports manually for each firm since 2009, depending on the availability of the annual reports for each year and firm. It turns out that the adoption was not limited to one year (i.e., not mandatory). In other words, there is no specific cut-off point at which the companies were applied, rather the application differed from one entity to another, meaning that there were entities that were implemented in a particular year, and there were entities that were implemented in another year, and so on. The adoption process was not simultaneous, and one can call it 'voluntary adoption'. To verify this, the researcher had to refer to the FRC's reports in 2015 and 2018 and to read them carefully. He found that, in the report published in 2015, there was no obvious and explicit text in this document that the application of these standards is compulsory, but it has been found that these standards are 'effective'. However, for the report published in 2018, the researcher found a clear and explicit word that the implementation of these standards is "mandatory", and it has been referred to the year 2015 in this report. Thus, after downloading all the annual reports, it has been found that, by the year 2019, all firms included in the study sample were following FRS 102. Hence, I conclude that the adoption from 2009-2018 was voluntary.

UK 300 Best SMEs

After reviewing most of the quantitative and qualitative definitions assigned to SMEs in many countries, whether declared in previous studies or disclosed in the governmental reports (e.g., UNCTAD, 2000a; ABS, 2002; EC, 2003; 2015; Botosan, et al., 2006; IASB, 2009a; Pacter, 2009; Nobes, 2010; SBA, 2012; Perera and Chand, 2015, p.167; Ram and Newberry, 2013; Berisha and Shiroka-Pula, 2015), the researcher finds that SMEs do not have a unified definition and the definitions are still open to debate. In Europe, for example, the European Commission (EC) in 2003 set a criterion to define SMEs which was related to the staff headcount, turnover and balance sheet total. In 2015, the EC also launched a new definition of SMEs which includes new thresholds for SMEs definitions related to the nature of the firm if it is autonomous, partner or linked enterprise (details are provided in Chapter 2). Thus, the process of choosing one definition is challenging. However, after undertaking extensive research on studies conducted on SMEs, the present researcher found a study conducted by Francis, et al. (2008) who examined the incentives for SMEs adopting IAS and relied on the World Business Enterprise Survey (WBES) conducted by the World Bank in 2002 to identify their study sample. The survey covers the period of late 1999 and early 2000. Following a similar logic of sampling SMEs, we form our sample of SMEs by relying on three different reports published by reliable authorities in three different years. The following paragraph shows the process in detail.

It has been found that there are three reports published by three different bodies in different years, where each report has a different list of firms. Firms in these reports are defined as SMEs based on the EC's (2003) definition.[4] Each report comprises 100 enterprises and is based on various criteria that were labeled as the best SMEs. The set of classification criteria includes

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[4] The researcher has made sure that the criteria mentioned in the EC's (2015) definition of SMEs are also consistent with the features of these firms.

various measures related to innovation and operating performance but not reporting and disclosure practices. The first report published by the Business Magazine-Thames-Valley in 2012 has been confirmed by the bank Santander, Vital Six, Field Seymour Parkes, Haines Watts chartered accountants and business advisers, business authorities who hold business growth and a renowned law firm. The SMEs 100 list in the first report ranked by sales, have bigger workforces, includes a wide diversity of businesses, innovation and productivity are at their best. The second report released in 2014 by BHP Chartered Accountants. The SMEs 100 list in the second report ranked based on the business performance, while the third report was published in 2018 by The Sunday Times. The SMEs 100 list in the third report ranked based on the fastest-growing overseas sales (The Best SMEs, 2012; 2014; 2018).

Each firm in each report has been observed from 2009 to 2019. The annual reports for each firm in each year have been downloaded and investigated to determine the year of adoption of FRS 102, depending on the availability of annual reports.

As a robustness check for the sample validity, the data of the companies included in the reports (for example, number of employees, turnover, total balance sheet) were checked to see whether they matched what was stated in the 2003 European Commission definition and, were found to be in line with this definition; however, the data structure is a panel and is based on the instructions in EC's report (2015), so each company has been verified each year, whether they are still SMEs or not. Then, after confirming that the firms are SMEs, different criteria are set for each paper to develop the study sample.

The SMEs listed in each report have been checked by name as well as their previous name to confirm that each report has a different list of SMEs. These reports were combined, and they become akin to one sample and the data for each firm observed from 2009 until 2019, depending on the data availability. The researcher is well aware that combining these reports

cannot completely mitigate the issue of selection bias and considering the best SMEs as a study sample might be considered as idiosyncratic and could not be argued to be a representative sample. But it is also possible to consider this issue from another angle. To illustrate, FRS 102 is issued with new requirements for SMEs, and brought about significant changes related to the measurement and evaluation of assets and liabilities (FRC FRS 102, 2015), and the changes could be clearly observed on the best SMEs, and if so, then they could also be observable on the general SMEs. In both scenarios, caution must be considered when interpreting results.

Statistical techniques

This section shows the main statistical techniques used to in each paper. This research is divided into two parts, the first is concerned with knowing what the SMEs' incentives to implement are, and the second, after the application, is concerned with that the most important implications of implementation. The first is specifically focused on examining what drives SMEs to adopt FRS 102. To achieve this purpose, the discrete proportional odd 'multi-period logistic regression' has been utilized. Prior studies applied the logistic model, and it has been found that the majority of these studies were related to the listed companies, and the phenomenon of applying standards in most of these studies was mandatory. The issue in this research is somewhat different, as the study sample includes SMEs, and the application of FRS 102 was not mandatory. Interestingly, a recent study among the prior studies reviewed, conducted by Bassemir (2018) has examined the determinants of the IFRS adoption by the private firms in Germany. The adoption process of the private firms was not mandatory, and the discrete hazard model 'multi-period logistic regression' is utilized to achieve the study purpose. Accordingly, the discrete hazard model 'multi-period logistic regression' is used to consider the time-varying baseline hazard rate and to incorporate all firm-year observations for the event year and pre-event years. To clarify further, first, the researcher is interested in studying SME's characteristics before the adoption (i.e., incentives to adopt), thus all firm-year

observations until the year of adoption are the core interest of analysis, while all observations after the adoption are more meaningful for the consequences (i.e., the second part of the research). This is in line with discrete proportional odd requirements that all observations after the adoption must be deleted (see Jenkins, 2005). Second, the discrete-time survival approaches are appropriate for longitudinal applications, especially when the data are generally gathered at discrete-time periods (Xie, et al., 2003; Sharaf and Tsokos, 2014). Third, it considers all year observations for each firm and because the adoption process is not simultaneous, this kind of analysis considers the "time-varying baseline hazard rate" as the characteristics of companies change over time which serve to defeats such biases such as sample selection, incompatible estimates and biased probabilities that derive from using one observation or one-period model (Shumway, 2001; Hillegeist, et al., 2004, p.20). Nevertheless, the normal logistic regression is used, as is shown in Appendix A, and the results are qualitatively similar to those reported in paper one, but the effect of time is omitted from the normal logistic regression as this kind of analysis cannot control for the correlation between time effect and main dependent variable of the model (i.e., FRS 102 adoption).

As for the second and third paper, both fixed effect regression and the generalised Difference-in-Differences (DID) with two-way fixed effect model have been used. Before discussing the main reasons for using the generalized DID with two-way fixed effects, the typical approach used to examine the effect of accounting standards such as IAS/IFRS is the difference in differences approach, which is presented below:

$$Dependent\ variable = \beta_1\ IFRS + \beta_2\ Post + \beta_3\ Post\ \times IFRS + Controls + \varepsilon,$$

Where the dependent variable is the outcome variable, *IFRS* is a binary variable that takes the value of 1 for firms that adopted *IFRS* (i.e., treatment firms) and 0 for firms that did not adopt (i.e., control firms). Post is a binary variable that is coded 1 for fiscal periods after the adoption

of *IFRS* and 0 for the fiscal period before the adoption of *IFRS* (see De-George, Li and Shivakumar, 2016).

This model usually applied when there are only two periods i.e., the adoption of the standards is mandatory. However, in this research there are more than two periods, i.e., the adoption process is not simultaneous or voluntary, thus we are limited to using the generalized DID with two-way fixed effect (see Wing, et al., 2018). The general form of the generalized DID with two-way fixed effect is presented below:

$$Dependent\ variable = \beta_1\ IFRS + \sum IFRS \times Controls + a_i + b_t + \varepsilon,$$

Where IFRS is a binary variable coded 1 for the fiscal periods after the adoption of *IFRS* and 0 for the fiscal period before the adoption of *IFRS, α_i* represents the firm-fixed effect and b_t represents the time-fixed effect.

In this research, the structure of the data is an unbalanced panel, and the study timeframe is from 2009 to 2019, and the adoption process is not simultaneous (i.e., more than two periods). This implies that the generalized DID with two-way fixed effect will be used in this research. Since all SMEs included in the study sample have complied with FRS 102 by the end of the period, then all firm-year observations before the adoption of FRS 102 are coded 0 and treated as a/the control group, while all observations after the adoption of FRS 102 are coded 1 and are treated as a treatment group.

The following section shows a clear statement of the research contribution and summary of the key findings of the three papers.

1.5 Research Gap and Contribution

The research gap and contribution are clearly explained and identified in each research paper. However, this section will show the general gap in the research, the general contribution of this thesis, and expected implication as below:

After reviewing previous studies on the IFRS for SMEs, the research found that most of studies related to the IFRS for SMEs adoption are either focused on the macro-level factors (i.e., country level) or on micro-level factors (i.e., firm level). On the one hand, for studies conducted based on the country level which are related to the IFRS for SMEs adoption, the UK was not included because it did not apply those criteria (as is explained in chapter 2) and, if included, it was treated as not applying those criteria. Thus, the results of the studies reflect the determinants and consequences of the IFRS for SMEs adoption only for those countries that adopted. Hence, our knowledge of the SMEs determinants and consequences of the IFRS for SMEs adoption in the UK is still unknown. On the other hand, for studies conducted based on the firm level which are related to the adoption of the IFRS for SMEs, most are conducted based either on questionnaires or interviews and, to the best of the researcher's knowledge, none of the preceding studies related to the adoption of the IFRS for SMEs are conducted based on the firm's financial statements and annual reports. However, with the issuance of the FRS 102 as a new event, in the UK as a proxy of the IFRS for SMEs (FRC FRS 102, 2015) in 2015, and with the public availability of both financial statements and the annual reports of SMEs in the UK, it introduces further evidence to the theory and literature about the accounting standards adopted by SMEs in the UK in order to bridge that gap.

It has been argued that there is an inadequate understanding of accounting issues faced by private firms and SMEs (Son et al., 2006; Francis, et al., 2008). SMEs in the UK constitute 99% of all businesses and are the main driver of economic growth (Rhodes, 2019). This therefore gives an interesting setting to focus on SMEs in the UK as a fertile and effective environment for actualizing and implementing new accounting standards, especially for SMEs. Thus, to contribute to a better understanding, after setting specific criteria to specify the study sample and the timeframe for this research, the annual reports of SMEs in the study sample have been downloaded manually over the study period for each entity to investigate the type

of accounting standards adopted by these firms. The investigation results show that the UK's SMEs in the study sample were following the old UK GAAP and then converted to new standards called FRS 102. Interestingly, the conversion process was not simultaneous, and there is no specific year for the application to be mandatory. After referring to the reports related to accounting standards for SMEs, it was found that there is a report issued by the FRC in 2015 which states that the old UK GAAP has been revised and replaced by the new UK GAAP which include several standards, and the core of these standards is the FRS 102 as it includes new requirements for SMEs, and it is considered as a proxy for the IFRS for SMEs (FRC FRS 102, 2015). Therefore, FRS 102 is a new event for SMEs in the UK, and it is a proxy for the IFRS for SMEs and has fundamental differences between them and the old UK GAAP and IFRS (PWC, 2013). Hence, studying FRS 102 will increase our understanding of the issues and accounting standards from the lens of SMEs in the UK that rejected the option of the IFRS for SMEs beforehand.

This study is expected to promote both theoretical and practical contributions. The theories that were referred to previously (see Section 1.2) are used in several contexts in the each of research papers, and thus obtaining results consistent with these theories will reinforce these theories as effective and valid within the context of SMEs in the UK, and in return, obtaining results that differ with what came with this theory will provide additional evidence for these theories from the perspective of SMEs. This will broaden our understanding of the international accounting and reporting practices towards the adoption of the FRS 102 in the UK's SMEs. It is also possible for standards-setters, policymakers, and regulators to take advantage of the theoretical arguments that will be constructed in this study about the process of movement from old UK GAAP to the new UK GAAP 'FRS 102'. In addition, it might be valuable to add a theoretical contribution to the IASB theoretical framework, as the new UK GAAP are exclusive and a new subject was recently issued by FRC, a prescribed body. Moreover, the fact that the

effect of applying these standards is still somewhat ambiguous, means that it could be a topic of high value for the FRC and IASB.

Since IFRS for SMEs have not been applied before by the UK's SMEs, this study is also an incentive for constituents (i.e., policymakers, standards setters, preparers, users and regulators) to constitute an initial image of the IFRS for SMEs adoption by focusing on the FRS 102 (which is largely based on the IFRS for SMEs) from the lens of SMEs in the UK. This will contribute to further recognizing the economic cost and benefits that SMEs encounter in selecting FRS 102 among accounting policies choices. Cost and benefit are necessary to assess accounting standards (Sellhorn and Gornik-Tomaszewski 2006; Nobes, 2010). Thus, in practical terms, this study could contribute to a greater understanding of the implications of the new standards because it is a new option for SME managers rather than the old criteria choices, especially as FRS 102 brought significant changes to various scopes, as mentioned earlier (see Section 2.2, Chapter 2), such as financial instruments which could affect the estimation and valuation options for assets and liabilities which affect the reporting of financial position and contracting environments (PWC, 2013). Moreover, the decision regarding the process of transition to new standards in terms of cost and benefit gives decision makers the ability to make a rational decision by providing them with a well-structured theoretical model and results. Hence, this could provide valuable insights for the judgment and decision-making process. Further, the current research results would be of use to regulators, the accounting professions, policymakers, standards setters, and firms' managers in order to reap the benefits of the new UK GAAP (FRS 102) application in a way that helps them reach the level of quality desired by the FRC and IASB, particularly on topics relating to old UK GAAP and the new UK GAAP 'FRS 102' as a proxy of the IFRS for SMEs.

This study is also expected to bridge the gap in the UK as a developed country in terms of economic progress and the cultures of specialist and standards setters in the IASB who promote

the UK GAAP in its new form, in addition to the decisions by firm managers as regards retaining the old UK GAAP or moving towards the new UK GAAP. The culture of the appropriate application of the accounting standards should also be considered to improve the level of corporate disclosure and transparency in financial reporting in the developed country. Therefore, this study is expected to fill these cultural differences and provide useful recommendations relating to these issues.

The study's findings are also expected to be relevant for regulators in neighbouring countries which are considering adopting measures to improve the quality of financial statements. Furthermore, if the market perceives that the high quality of financial reporting in SMEs are linked to a proper decision (whether to use the old or new UK GAAP), the statements of financial reporting could be seen as a dependable source for external users to conduct an investment decision and credit evaluations. Therefore, it is expected that the results of the study will be useful to the financial analysis and accounting professions by observing the current study's results on the market response to the firm decision.

1.6 Summary of the Key Findings

The results of the first paper show that, although the FRS (102) has more simple and clearer requirements and has more reduction in disclosure requirements than the old UK GAAP, SMEs with a high rate of leverage are less likely to adopt the FRS (102). This implies that SMEs with a high level of leverage are more likely to communicate with their creditors under the old UK GAAP and suggests that there are private channels with creditors under the old UK GAAP to create an implicit and flexible debt contract environment and to facilitate the transmission of information. Hence, FRS 102 increased monitoring and there are undisclosed items under the old UK GAAP to creditors and to the public. Expected future growth, audited accounts and industry, however, are the SMEs' incentives to adopt FRS (102).

The second paper examine the impact of FRS 102 on the quality of the financial reporting. Further, to confirm that FRS 102 does increase monitoring from creditors, the relationship between earnings management and FRS 102 has been examined after considering the moderating impact of FRS 102. The results show that FRS 102 contributes to increasing reporting quality among SMEs. Further, the study finds that leverage has a positive relationship with earnings management before FRS 102 adoption. This implies that the UK SMEs included in the study sample that are characterized with high leverage are more likely to manage their earnings to avoid the debt-covenant violation, while the adoption of FRS 102 has a negative effect on the relationship between earnings management and leverage. This implies that, when companies obtain debt, their business will be monitored by market, analysts, and investment bankers; thus, it is unlikely for companies' managers to manage earnings due to being subject to control and monitoring, especially companies with high leverage. Hence, FRS 102 has helped to enhance control within the firm, and thus to mitigate the opportunistic behaviour of managers.

To contribute to a better understanding of the relationship between SMEs and their creditors after the adoption of FRS 102, the third paper examines the impact of FRS 102 on the relationship between bank credit and trade credit. The key findings shows that UK SMEs would use bank finance to substitute trade credit received from suppliers before the inception of FRS 102, whereas we document an increased reliance on trade credit received due to restricted access to long-term bank loans in the aftermath of FRS 102 adoption. We observe a steady decline in the level of long-term debt, as well as an increase in trade. Thus, it can be deducted that, from a loan demand perspective, firms might want to avoid the additional scrutiny from banks. Higher quality information facilitates bank monitoring. For example, such information might be more likely to trigger debt covenants and thus attract more intense monitoring. Hence, firms might switch to trade credit after FRS 102 adoption. Conversely, when SMEs are the

suppliers of trade credit, for example, to their customers, the transition to FRS 102 does not affect their decision whether to use trade or bank credit, which confirms our conjecture that the intermediary relationship between SMEs and their customers is less susceptible to the enhanced quality of accounting information disclosure.

1.7 Thesis Structure

The rest of this thesis is organized as follows. Chapter 2 reviews the literature and theories related to the topic of the thesis. Chapters 3 to 5 comprise the three empirical studies. Each paper is in the form of a journal article and the full bibliography is presented at the end of the thesis. Chapter 6 summarizes the key findings of the individual papers and provides the overall conclusion, implications, research limitations, and future scope.

The details of the thesis chapters are as follows:

Chapter 1	Introduction
Chapter 2	Literature review
Chapter 3	Paper 1: 'To be or not to be' –Adoption of FRS 102 by UK SMEs
Chapter 4	Paper 2: Does FRS 102 Matter? Evidence from UK SMEs'
Chapter 5	Paper 3: Trade Credit versus Bank Credit: Evidence from SMEs' Adoption of FRS102
Chapter 6	Conclusion

Chapter 2 Literature Review

This chapter will initially review the definitions of SMEs and their importance in order to provide an appropriate background to the nature of these entities (see Section 2). Further, this chapter will present the development of the IFRS for SMEs, their pros and cons as well as the adoption of these standards globally and in the UK. In addition, previous studies related to the determinants and consequences of the IFRS for SMEs adoption will be presented, followed by the theories used in the three papers.

2. SMEs – Definitions and Significance

- *Definitions*

The diverse characteristics of SMEs across countries in terms of sectors, level of informality, integration into the global supply chain, sizes, cultures, and the state of economic growth in which SMEs operate, all combine to make it difficult to reach consensus on a unified definition of small business (UNCTAD, 2007b; Kushnir, 2010). The definition of SME in many countries depends on several different financial measures such as annual turnover, number of employees and balance-sheet total; however, these thresholds are not used or applied uniformly at the international level, since there is no single definition containing all the aspects of SMEs (UNCTAD, 2000a). Thus, it is agreed that there is no unified definition of SMEs. Along the same lines, the World Bank continues to recognize that there is no standard definition for SMEs, as this is generally based on state standards which vary widely and do not necessarily follow standards rooted in empirical differences in the behaviors, characteristics, or limitations of companies (World Bank, 2011).

Initially, the main reference in the definition of SMEs was based on several characteristics. For instance, companies can be classified as small if they have the following features: (1) the

company should be managed by its owners; (2) economically, it should have a reliably small share of the market; (3) independence, meaning that small enterprises should not be a part of large projects (Bolton, 1971, Stokes and Wilson, 2010; Berisha and Pula, 2015). These features are also confirmed by the Organization for Economic Co-operation and Development (OECD, 2014), which has largely emphasized the issues of ownership and independence. The OECD (2014) pointed out that if you want to be a small entrepreneur, you must have a high-level of independence and be able to take on responsibilities alone so that you are fully responsible for business activities within your company. Additionally, the organization indicates that personal relationships and individual qualities are more important than the hierarchy and promotion systems that are found in large companies, since small companies by its own nature have limited resources and transactions which rely heavily on personal relationships such as relations with suppliers and accountants. Therefore, business networks are social networks, and the company's success or failure depends heavily on personal relationships (OECD, 2014). However, it is observable that it is not easy to operationalize the definitions of these characteristics in order to consider them as a reference to determine firm size. There is, therefore, a need to find other definitions through which companies can be classified into several categories (Curran and Blackburn, 2001). Hence, the definitions began to appear in many countries to determine the size of the companies, especially the SMEs.

After reviewing the previous literature, several definitions related to SMEs will be provided. For instance, in the United States of America (USA), the Small Business Administration (SBA) has set an approach "size standard" based on average annual receipt or number of employees for different types of industries. For example, for most of the mining and manufacturing industries, the SBA has a set of 500 employees and for the most of non-manufacturing industries, the SBA has set US\$7 million in average annual receipts (SBA, 2012, Perera and Chand, 2015). In Australia, the Australian Bureau of Statistics (ABS) classifies firms as micro

enterprises if the number of their employees does not exceed four, and firms are considered as small firms if they have less than 19 employees, whereas firms that have a number of employees between 20 to 199 classified as medium (ABS, 2002). The definition of OCED (2019) is limited to the number of employees. To illustrate, if the number of employees extends from 10 to 49, then it is classified on the basis that they are SMEs, but firms with more than 250 employees are classified on the basis that it is large (OECD, 2019). Likewise, in Canada, the definition of SME is based on the number of employees. Therefore, and based on the Key Small Business Statistics (KSBS) report provided from the Government of Canada's website, a firm is classified as small if it has 1 to 99 paid employees whereas it is considered as medium-sized if it has 100 to 499 paid employees (KSBS, 2013).

However, following the exponential development of these firms at the local and international level, the scope of interest and research has increased. Thus, the definitions of these companies are no longer limited to size but encompass other criteria such as non-publicly accounTable entities or non-listed or private entities (Botosan, et al., 2006; Nobes, 2010; Ram and Newberry, 2013). For example, the IASB (2009a, p.10) defines SMEs, after the issuing of the IFRS for SMEs in 2009, as ''entities that do not have public accountability and publish general purpose financial statements for external users''.

Since the focus of this research is on SMEs in the UK, the definitions related to the European Commission will be reviewed as follows:

In 2003, the commission's recommendation 2003/361/EC identified three essential considerations ascertaining whether an enterprise is an SME, which are:

1. Staff headcount
2. Either turnover or balance sheet total

Table 2.1: EC's definition of SMEs in 2003

Company category	Staff headcount	Turnover		Balance sheet total
Medium-sized	< 250	≤ € 50 m		≤ € 43 m
Small	< 50	≤ € 10 m	or	≤ € 10 m
Micro	< 10	≤ € 2 m		≤ € 2 m

Note: source adapted from the EC (2003).

However, in 2015, the EC released a new user guide to the SME definition which includes new thresholds for SMEs definitions. The definitions of the new report are not radically different from the definitions contained in the 2003 report, but they have added many points. For instance, before calculating the maximum threshold for any company, it is necessary to identify the nature of the company as to whether it is autonomous, a partner or a linked enterprise. Therefore, if the company is identified as autonomous, thus the financial measure and the number of employees reported in their annual documents will be needed to verify their eligibility to SMEs, while if the company is regarded as a partner, a percent of the overall number of employees plus other financial data of their partner must be joined to the company in question. While, if the company is recognized as a linked enterprise, then 100% of the linked company data must be added to the data of the company in question (EC, 2015). However, the bulk of SMEs "subsidiaries" are wholly owned by parent firms, meaning they are classified as "linked enterprises". Therefore, if we rely on the classification of the EC in 2015, that is, 100% will be added to the subsidiary's data, and proportionately, we will lose most of the enterprises in the study sample as the values will exceed the threshold arrayed by the EC reports in 2003. Thus, despite the emergence of new definitions, they are still contested.

- *Importance of SMEs*

SMEs are one of the most important considerations that play a crucial and vital role in many economies as they play the role of economic engine that is always seeking development. In developed and developing countries, SMEs are considered the backbone of their market economy. Therefore, globally, most firms are SMEs (Evans, et al., 2005; Siam and Rahahleh,

2010; Maseko and Manyani, 2011; Hope, Thomas and Vyas, 2013; Muller, et al., 2014; Kaya and Koch, 2015).

The European Commission remarked that SMEs make up nearly 99% of business in the European countries and noted that over the past years that SMEs were responsible for creating 85% of new jobs. The statistics show that SMEs were responsible for employing 93 million people, making up 67% of the employment rate in all European countries, which contributed 57% of value added in all non-financial sectors. Moreover, the results show that the employment opportunities in these companies continue to increase from year to year. For instance, employment increased by 1.6% from 2015 to 2016, which led to an increase in value added by 1.4% in 2016 after achieving an increase of 5.8% in 2015 (EC, 2017). In the OECD region, SMEs represent nearly 99% of all businesses, and have thus been regarded the dominant form of enterprise. They are considered the main source of employment, as they account for about 70% of jobs on average; they are the main drivers of value creation, and on average they make between 50% and 60% of added value (OECD, 2016b; OECD, 2017). In developing economies, SMEs support up to 45% of overall recruitment and 33% of GDP. When the contribution of informal business is considered, SMEs support more than half of recruitment and GDP in most nations regardless of income levels (IFC, 2010, OECD, 2017).

The statistics for the year 2020 indicate that the proportion of SMEs amounted to about 6 million entities in the UK, which constitutes more than 99% of the total business, while micro entities (i.e., up to 9 workers) constitute approximately 96% of the businesses. Also, the birth rate of SMEs increases from year to year compared to SMEs that die off, for example, the number of SMEs that were born during the previous five years is greater than the period before it, for instance, in 2019, the birth rate of SMEs was 60% more than those that were in 2000; in contrast, the number of SMEs that died off was 59% in 2019 compared to the year 2000 (Ward, 2021).

These facts above show that the SME sector plays an important role in the development of economies, as it is the most important sector for many developed and developing economies around the globe and is the backbone of the UK economy that contributes to opening new markets, stimulating growth, and forming jobs. Thus, SMEs' contribution is significant.

2.1 IFRS for SMEs

This section is organised as follows. Section 2.1.1 reviews the development of IFRS for SMEs. Section 2.1.2 discusses the adoption of IFRS for SMEs. Section 2.1.3 reviews the literature review on the IFRS for SMEs determinants and consequences. Section 2.2 presents the development of the new UK GAAP 'FRS 102'. Section 2.3 outlines the relevant theories.

2.1.1 Development of IFRS for SMEs

In 1998, the IASC stated the fact that international accounting standards should contribute substantially to promoting corporate disclosure in terms of comparability, transparency and quality (IASC, 1998). The IASB reinforced these endeavours as it was keen to create and develop a single set of international accounting standards that are characterized by many qualities: high quality, comprehensibility, and, most importantly, enforceability. The Board additionally commended its insight to work with local standard setters to achieve the goal of convergence (Pacter, 2005, p.71; Van der Meulen, Gaeremynck and Willekens, 2007). Regulators were also keen to attract foreign investment to local markets, where they develop common disclosure and reporting requirements for global organizations and entities to pull in foreign entities to these business sectors (Hora, Tondkar and Adhikari, 1997). Hence, the IFRS was issued (Kılıç, Yuar and Ataman, 2016), and in compliance with the international accounting standard regulation (2002/3626 / EC), the publicly trading companies trading their securities in the EU regulated market are required to adopt the IFRS in 2005. Subsequently, this decision had implications, particularly for firms listed in secondary capital markets. For

instance, AIM market in the UK stressed that their listed companies must also comply with IFRS (Fox, et al., 2013).[5]

The SMEs that were not subject to public accountability were following either GAAP[6] or IFRS in compliance with the laws of individual jurisdictions (Tyrrall, Woodward and Rakhimbekova, 2007; Alp and Ustundag, 2009). However, there have been many SMEs suffering from an inability to prepare their financial statements in accordance with the IFRS as they do not have equity securities or publicly traded debt (Poroy, Arsoy and Sipahi, 2007). Further, although the IASB issued the full IFRS to be applicable to all companies, critical voices arose regarding the cost incurred by SMEs in applying the full standards in addition to the problems that they face in relation to the cost of tax (Albu, Albu and Fekete, 2010; Mandilas, et al., 2010; Fekete, et al., 2012; Ciubotariu, 2013; Kreipl, Hane and Mueller, 2014; Kaya and Koch, 2015; Kılıç and Uyar, 2017). Therefore, there was a crucial need to develop an appropriate conceptual framework that gives high importance to the comparative accounting information given by SMEs. Thus, the adoption of IFRS for SMEs has come to raise the financial reporting comparability of companies that do not apply IFRS, and this might be considered as a possible solution in the EU (Albu, Albu and Mădălina Gîrbină, 2013). Accordingly, the IASB decided to add the IFRS for SMEs to its own agenda because of the pressures that have been faced by external parties (Ram and Newberry, 2013, p.4). Following that stage, on 9 July 2009, the IASB issued the IFRS for SMEs because of the solid global request from both developed and developing economies to include new specific requirements

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[5] AIM market also includes listed SMEs that comply with the IFRS.
[6] In 2008, the Financial Reporting Standard for Smaller Entities (FRSSE) has been issued. The FRSSE measurement bases are for the most part the same as those in the UK GAAP. But, under various conditions, the accounting standards' disclosure requirements of those considered as part of the FRSSE have essentially been diminished. the FRSSE is relevant to firms that have been classified as small under the 1996 Entities Analogous and Company Act. Most importantly, the application of these standards is optional. However, in 2013, the FRSSE was modified to permit the Micro entities to comply with FRSSE. Interestingly, in periods beginning on or after 1 January 2016, the FRSSE is withdrawn, and the micro entities are required to follow the FRS (105) "The Financial Reporting Standard applicable to the Micro-Entities Regime to support the implementation of the new micro-entities regime" (Iasplus-FRSSE, 2018; FRC FRS 105, 2015).

for SMEs (Jermakowicz and Epstein, 2010). Consequently, the results of the rigorous process initiated by the International Accounting Standards Board (IASB) culminated in the issuance of the IFRS for SMEs as a goal to create a simplified version of the IFRS, with a measurable reduction in the disclosure requirements and measurement principles (IASB 2009; Perera and Chand, 2015).

IFRS for SMEs were immediately effective when they were launched (Pacter, 2009b), and it was expected that the regulatory framework of the IFRS for SMEs would be beneficial through meeting the needs of SMEs by simplifying the process for firms and jurisdictions that consider the adoption of full IFRS to be overly complex (IASB, 2009). IFRS for SMEs have been reduced by more than 85%, to 255 pages, as compared to the full IFRS (Pontoppidan, 2008). This was achieved by amendments to the content of the full IFRS, for example, excluding some of accounting issues, eliminating specific choices of accounting treatments and simplifying approaches for recognition and measurement (Epstein and Jermakowicz, 2007).

Specifically, in terms of recognition and measurement simplifications, the disclosure items for the full IFRS agenda up to about 3000 items, yet about 300 disclosures in the IFRS for SMEs. This has been achieved through the deletion of many disclosure elements that appear inappropriate for SMEs. What follows are some examples of topics that have been deleted: (1) "available for sale" and "held to maturity" are option for the financial instrument (IAS 39) as well as the fair value choice omitted; (2) the revaluation model in both (IAS 16) "Property, Plant and Equipment" and IAS (38) intangible assets; (3) "proportionate consolidation for investment in jointly controlled entities; (4) the measurement for the investment property is determined by condition instead of the option between the fair value and cost models, and if the investment property can be measured at fair value and reliably without incurring any cost, the fair value is used here; otherwise, the cost model is appropriate (Jermakowicz and Epstein, 2010).

IFRS for SMEs are characterized by many positive qualities, such as that reducing the cost and disclosure requirements companies and their complexity by eliminating many of the disclosure requirements that do not meet the objectives of SMEs and also simplifying many disclosure and recognition requirements (IASB, 2009a, Perera and Chand, 2015). Regardless of the economic significance of SMEs, there is an inadequate understanding of accounting issues faced by these entities (Son, Marriott and Marriot, 2006; Francis, et al., 2008).

The IASB commended the fact that accountants are required to obtain sufficient training to understand the consequences of using international standards for SMEs (IASB, 2004). However, it has been noted that SMEs are characterized with a low level of proficiency "numeracy skills", an absence of accounting education and the non-existence of computerized accounting systems in an SME domain (Roberts and Sian, 2006). Therefore, due to having a predetermined number of assets and staff, implementing IFRS for SMEs is presumably going to influence SMEs into incurring heavy costs (Poroy Arsoy and Sipahi, 2007). Moreover, SMEs often lack incentives that are considered as a critical purpose to set up the large companies' reports with high quality (Ricci, Cillo and Landi, 2010); the subsequent absence of transparency may influence their agreements with outside parties (Francis, et al., 2008).

Moreover, although the IASB created accounting standards for SMEs primarily to meet the needs of users of financial statements for SMEs, and also to ease the financial reporting burden on SMEs, it appears that the IASB was not able to identify the target beyond these standards (Ram and Newberry, 2013), for several reasons. Firstly, although the users' roles of IFRS for SMEs are very important as they are the real users of these standards, it has been observed that the IASB consultation processes on IFRS for SMEs do not include a significant role by those users (Quagli and Paoloni, 2012). Secondly, "moves for differential reporting are frequently driven by other groups than users, such as practitioners and academics" (Evans, et al., 2005, p.38). Thirdly, it was noted that users are less dynamic than the preparers, especially in the

consultation processes (Quagli and Paoloni, 2012; Ram and Newberry, 2013). Fourthly, it has been asserted that users that are incorporated into the consultation process are unrepresentative for SMEs (Ram and Newberry, 2013). This shows that the issue of IFRS for SMEs is a controversial one.

2.1.2 The adoption of IFRS for SMEs

Publishing and presenting the accounting standards is one of the most prominent duties of the IASB, however, the standards must be approved by both private sectors such as banks, stock exchanges, in addition to the legislators who must agree that these standards are effective. This could influence the organizational IASB's structure which is constantly seeking to establish a harmony between the perception of the external bodies and the independence of the IASB in setting the standards. Thus, on the one part, the IASB seeks to be autonomous and to not to be subject to any form of direct authority, as it seeks to carry out its own projects of standardization independently without being predisposed by any other parties. Private entities, in general, rely on assistance from the governmental and political bodies, in addition to their eagerness to collaborate with the IASB (Botzem, 2012). Within this context, based on the report "Feedback to constituents-EFRAG final comment letter"[7] published on April 2014 by the European Financial Reporting Advisory Group (EFRAG), numerous respondents believed that the IASB ought to build up a clearer perspective about the appropriateness of IFRS for SMEs. The report noted that one respondent indicated that there was a disparity between the IASB's interpretation of the IFRS for SMEs scope and the stated scope of IFRS for SMEs. This led to a large gap in the framework of standard setting. This also led to the jurisdictions limiting their ability to

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[7] The consultation process with the interested public is a primary transmission channel through which the consultation, presentation and opinions are presented. In addition, through these channels, there is a likelihood of meeting with other groups and with domestic norms setters. Although consultation procedures grant the opportunity to all bodies to communicate and engage in, the private parties are the primary parties in these processes. Additionally, comment letters are a fundamental part of the consultation process and are managed by individuals and regulatory bodies to express their views on the IASB discussion papers or to convey their views on the exposure projects promulgated by organizations in relation to the issuance of standards (Botzem, 2012).

adopt IFRS for SMEs, either relying on GAAP not based on IFRS or IFRS for SMEs in order to meet the needs of jurisdictions. Because of this, neither has achieved the main objective for which the IASB was established, which includes the creation of a single set of international standards featured with high quality, enforceable and understandable (EFRAG, 2014). Thereby, most of the jurisdictions in numerous developed states such as the United Kingdom, Australia and the European Union member states, which are supporters of full IFRS, are yet to apply the IFRS for SMEs as they still face challenges and difficulties in implementing these standards (Perera and Chand, 2015). In conclusion, although the IASB had hoped that the IFRS for SMEs would have a vital future area within these companies, the trend towards IFRS for SMEs remains controversial, as there are many arguments created as a result of the difference in the degree of application of these standards by states (Ram and Newberry, 2013).

The Table below shows the latest statistics related to the extent of the IFRS for SMEs adoption at the international level.

Table 2.2: The adoption of the IFRS for SMEs around the world

Caption	Number of Jurisdictions				
	Africa and the Middle East	*Americas*	*Asia Oceania*	*Europe*	*Total*
IFRS for SMEs Standard is required or permitted	28	33	17	8	86
IFRS for SMEs Standard is currently under consideration	____	____	____	____	9
IFRS for SMEs Standard is not used or under consideration	____	____	____	____	71
Neither required nor permitted	23	4	17	36	____
Total	51	37	34	44	166

Note: Source (IFRS Foundation, 2019).[8]

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[8] The link below presents an analysis of the use of IFRS of SMEs Standards around the world. That analysis is based on the 166 jurisdiction profiles completed thus far by the IFRS Foundation. The link https://www.ifrs.org/use-around-the-world/use-of-ifrs-standards-by-jurisdiction/#analysis-of-the-use-of-the-ifrs-for-smes-standard.

The above Table shows that the adoption of the IFRS for SMEs varies among countries; however, since the context of this research focuses on SMEs in the UK, the European context will be the main focus.

In Europe, the option of applying the IFRS for SMEs at the supra-national level was rejected by the European Commission, and therefore the European Commission has left the decision to the Member States with the aim of making an individual decision regarding to the IFRS for SMEs (Kaya and Koch, 2015). Accordingly, in 2010, the European Commission (EC) has undertaken consultations to improve the understanding of the numerous nations' positions around the globe regarding the application of IFRS for SMEs (Albu, et al., 2013). However, the European Commission's consultation procedures have shown that there is a significant variation of opinions with respect to the application of IFRS for SMEs. For example, during the consultation sessions, it was found that most users generally preferred the IFRS for SMEs, while preparers opposed it (EC, 2010; Quagli and Paoloni, 2012). The Accounting Standard Board (ASB) also proposed the adoption of the IFRS for SMEs with some modifications that would balance the equation, but that proposal was met with resistance from many constituents. As a result, the EC has made it clear that the IFRS for SMEs have not been presented with objectives aimed at simplifying and reducing the administrative burden of SMEs (European Commission (EC) Explanatory Memorandum, 2011). Additionally, differences or inconsistencies in the disclosure requirements between IFRS for SMEs and EU Accounting Directive started to appear, particularly in 2013 when the new EU Accounting Directive (2013/34/EU) was released. For instance, the preparation of cash flow statement is compulsory under the IFRS for SMEs, where it is not under the requirements of new EU Accounting Directive (Kaya and Koch, 2015). Therefore, the new EU Accounting Directive formulated an argument which states that the IFRS for SMEs would not appropriately serve the objectives of simplification and reduction of administrative burden (EC, 2013). Hence, most of the

jurisdictions did not apply the IFRS for SMEs, where the UK is yet to apply the IFRS for SMEs (Perera and Chand, 2015; Kaya and Koch, 2015).

2.1.3 IFRS for SMEs determinants and consequences: a review of literature

Despite the importance of both full IFRS and IFRS for SMEs, more attention should be focused on the IFRS for SMEs, as SMEs make up most companies, providing common employees with innovative and new jobs and producing much of the inventiveness and improvement that fuels economic development (EC, 2008a; Alp and Ustundag, 2009). In specific, IFRS for SMEs is a welcome idea from the World Bank (WB), Association of Chartered Certified Accountants (ACCA), European Federation of Accountants and Auditors (EFAA) and the American Institute of CPAs (AICPA) as they believe that these standards will contribute substantially to improving the comparability and the quality of the financial reports of SMEs as well as helping these entities getting access to funding (Pacter, 2014). IFRS for SMEs were issued after four years of the mandatory implementation of the full IFRS (Jermakowicz and Epstein, 2010), where amendments and updates are still associated with these standards. Therefore, SMEs' environment is highly fertile for scientific research, and the accounting standards application for SMEs opens many doors for future studies (Nobes, 2010).

Following the discussion paper released by the IASB in 2004 entitled 'Preliminary Views on Accounting Standards for Small and Medium-Sized Entities', which discusses the most prominent queries concerned to SMEs and discusses the IASB approach toward issuing specific and separate financial reporting standard for the SMEs (IASplus, 2004), Evans, et al. (2005) reviewed the studies related to the aforementioned 2004 paper issued by the IASB. The result of their study shows that SMEs within the European Union are of high economic importance and are subject to differential reporting regulations. Thus, regarding the arguments presented by the differential reporting in the IASB's paper, there are unnecessary and inappropriate burdens and costs incurred by SMEs and insufficient statutory accounts for the

main users in the groups. By contrast, there have also been arguments against differential reports, which pointed out that SMEs should be global, that their financial reports should be comparable, and that they should serve external stakeholders. The study also pointed out several benefits of adopting the standards, such as it helps SMEs to access international funds and to make their financial statements more comparable, reducing the burden of unnecessary costs.

The IASB issued the Exposure Draft for SMEs (i.e., IFRS for SMEs) in 2007 (IASplus, 2007), and South Africa is one of the first countries that applied the IFRS for SMEs. Thus, studies in South Africa related to the IFRS for SMEs have since been emerging and flourishing. For example, Stainbank (2008) argued that the financial accounting standards would be suitable for SMEs in South Africa. By contrast, Wyk and Rossouw (2009) concluded that there was doubt among respondents in South Africa, who were involved in accounting procedures and processes in SMEs, that these standards might not ease the burden on financial reporting, and they showed that the benchmark, established by the IASB that the company should have 50 employees to identify the typical or normal transactions of SMEs, is very large for firms in South Africa, that the application of financial reporting standards in SMEs in South Africa is inappropriate. Hence, IFRS for SMEs adoption could be controversial; thus, to contribute to a better understanding, studies on factors that govern the adoption of the IFRS for SMEs and its related cost and benefits are presented in the following section. The first section presents the determinants of the IFRS for SMEs' adoption and its related benefits, and the second section shows the determinants of the of the IFRS for SMEs' adoption and its related costs.

- *Benefits associated with the adoption of IFRS for SMEs*

After issuing IFRS for SMEs in 2009, Atik (2010) suggests that SMEs support the existence of the IFRS for SMES and have a strong desire to apply them. Moreover, if the entity contains

an accounting sector, the additional cost resulting from the application of new standards will not be a barrier to the company; the presence of a foreign partner of the company with a view to importing and exporting may be in favour of these standards, as the preparation of financial reports by SMEs requires that these financial reports be in the language of recognized international standards (so as to be more comprehensible). In the same context, Masca (2012) finds that institutions' accounting culture in the area in which they work influences the views of the organizations regarding the widespread use of the scope of the IFRS for SMEs in Europe, and the application of the IFRS for SMEs is also affected by the geographical area in which the companies operate. In the same vein, Alver, Alver and Talpas (2014) suggest that the application of the IFRS for SMEs in Estonia is smooth and fruitful pointing out that this is due to the substantial legal and institutional variation in regulations, particularly accounting regulations that resulted from the shift from centrally planned to a market-based economy. This in turn has improved the accounting conditions and created a new environment. Likewise, Sithole (2015) find that IFRS for SMEs in the New Zealand environment increases the comparability and helps to improve the level of homogeneity and enhance the level of transparency. Additionally, the application of these standards supports simplicity as the standards have come to be more appropriate for SMEs. These results support the suggestions of Mamdouh (2015) that the IFRS for SMEs are a set of high-quality standards that have been allocated to meet the needs of the users of financial statements in small and fixed-sized companies, supporting the capabilities of SMEs and help them to achieve their goals in addition to obtaining financial statements with high reliability. Likewise, Rudzani and Manda (2016) suggests indirect advantages of the application of the IFRS for SMEs in South Africa such contributing to improving the access of SMEs to finance, in addition to these standards contributing to the process of improving the compliance of companies to tax regulations.

- *Costs associated with the adoption of IFRS for SMEs*

Although there are several benefits that can be obtained from the application of the of the IFRS for SMEs such as increasing transparency, reliability, comparability and comprehensibility of the financial statements, there are also numerous costs can be incurred, where the adoption of the IFRS for SMEs can be costly, time-squandering, and with a tendency to be subjective (Kılıç, Uyar and Ataman, 2013). Similarly, Kılıç, Uyar and Ataman (2014) suggest that cost and the lack of training are considered as an obstacle facing firms when implementing the IFRS for SMEs. Kılıç, Uyar and Ataman (2016) also suggest that the level of readiness of SMEs in Turkey is fairly low. The study outcomes show that many corporate departments lack sufficient knowledge of the IFRS for SMEs because they did not take training courses identified with these standards. Further, they find that internationality, size and independent auditing have a significant effect on the SMEs' preparedness, suggesting that firms that involved in the universal activities have greater readiness for the IFRS for SMEs than other firms. Although Kılıç and Uyar (2017) concur with Kılıç, Uyar and Ataman (2016) that the application of the IFRS for SMEs is complex and costly due to the lack of qualified and trained employees, the implementation of the IFRS for SMEs can add many favourable qualities to the financial statements of SMEs, such as increasing the quality and the transparency of the financial statements, and also will provide true, fair and reliable financial information.

Likewise, in Romania, Albu and Albu (2012) finds that the cost of applying the IFRS for SMEs is higher than the desired benefit due to the difference between local regulations and the regulations of the IFRS for SMEs. Further, accountants and professional accountants are still under development in Romania and users do not have a solid trust in IFRS for SMEs' guidelines and therefore do not have adequate knowledge and experience in dealing with these standards. Accordingly, the researchers suggest that these standards ought to be incorporated inside education systems to give a workplace the capability for actualizing these standards effectively

and to give the human resources the adequate involvement, which allows them to apply these standards correctly. A specific example of the cost of implementing the IFRS for SMEs within the Romanian context is the cost of borrowing under the IFRS for SMEs, which cannot be capitalized. In the revaluation of tangible assets, the fair value method is not allowed. There is no specific method or approach to be used for speeding up the depreciation. The method of impairment under the IFRS for SMEs follows IAS 39 which relates to (value in use and recoverable amount), and this method is different from the method used in the local standards in Romania (revaluation). The term "recoverable amount" does not exist within local Romanian standards (Buculescu and Velicescu, 2014).

Likewise, Albu, Albu and Fekete (2010) suggest that there is a mismatch between the existing instruction in Romania and the IFRS for SMEs instructions, and this is because the nature of change in Romania which occurs slowly in terms of standards, in addition to the lack of effective implementation of many accounting policies and principles. Similarly, Neag (2010) shows that the nature of IFRS for SMEs is complex and therefore it is difficult for micro entities in Romania to comply with these standards, so it is advisable that these entities follow the instructions and standards that are issued by the accounting bodies. A similar result is reached by Neag, Masca and Pascan (2009). Interestingly, Kreipl, Hane and Mueller (2014) conducted an online survey to examine which standards among these standards (Full IFRS, IFRS for SMEs or German GAAP) preferred by non-publicly traded medium-sized corporation in European Union and Germany private companies. The results showed that many companies face several challenges in implementing the IFRS for SME and therefore many non-publicly traded corporations prefer to use the full IFRS rather than the IFRS for SMEs. However, there is a greater preference for using the German-GAAP than the full IFRS.

In the same context, in Nigeria, particularly in Lagos State, Adetula and Owolabi (2014) suggests that the factor governing the application of the IFRS for SMEs in Nigeria is because

many countries around the world have applied these standards, but the results also indicated that there are many challenges for SMEs in Nigeria when applying these standards. For example, the need to apply such standards requires training workshops. These workshops are inherently costly to small businesses, and the implementation of these standards requires the recruitment of human resources with sufficient knowledge and experience of these standards, which is also an additional cost to SMEs. The study, accordingly, suggests that topics related to the IFRS for SMEs should be included within the educational system to be taught to generations and that this should be supported by the SMEs so that the cost will be reduced when implementing these standards in the SMEs as they will find a generation knowledgeable with these standards. A similar conclusion is reached by Litjens, et al. (2012) in The Netherlands that the perception of the preparers regarding the cost has a stronger relationship with the cost of IFRS for SMEs than with the benefits.

In the Czech Republic, Bohušová (2010) suggests that financial reports under a unified theoretical framework in Europe contribute to achieving the comparability and consistency in the financial reports. Thus, as listed public companies use the full IFRS, it is also necessary for private companies to follow a unified reporting framework that would increase the level of comparability, comprehensibility, and relevance in the financial reporting. Thus, the respondents of the questionnaire praised two main benefits of the IFRS for SMEs, one being that IFRS for SMEs compared to the GAAP are clearer and shorter. Further, the IFRS for SMEs should be optional and not mandatory, while keeping the option of GAAP available, especially for companies that prepare separate financial reports for certain parties or for specific purposes. In the meantime, there are costs to be incurred when applying the IFRS for SMEs, but the benefits of application are greater than the costs. Similarly, Civan, Körpi and Buyuran (2010) have pointed out that, although there are many difficulties in implementing these standards, the IFRS for SMEs were planned under a unified framework and separate from the full IFRS

standards, taking into consideration the needs of users, which helps SMEs access to finance and access to the foreign markets. This supports the evidence by Ikem, Chidi and Titus (2012) that SMEs are more likely to obtain financing when they provide high-quality financial information. Likewise, in the Czech Republic, Bartůňková (2012) also suggest that the use of the IFRS for SMEs can contribute to improving the comparison of financial reports and can improve the efficiency of the cross-border business. In addition, these standards can contribute to the opportunity for SMEs to have an opportunity to establish relations with foreign companies, which contributes to increasing their growth opportunities. However, many respondents pointed out that the application of the IFRS for SMEs is very complicated and costly for small entities. Most importantly, the researcher pointed out that the application of the IFRS for SMEs in the Czech Republic is not yet legally binding. These results support evidence provided by Strouhal (2012) that the application of the IFRS for SMEs can be a means of education and can improve the business environment and accounting profession. The researcher concluded that the benefit of applying the accounting standards is that they will contribute to increasing the comparability of the accounting information. However, the cost resulting from applying these standards is additional costs that may be resulted from preparing second financial statements, for tax purposes.

Although the application of the IFRS for SMEs began in 2009, Fiji has been late in implementing these standards. Since 2011, SMEs in Fiji are required by law to adhere to the IFRS for SMEs. Accordingly, Hussain, Chand and Rani (2012) find that the big 4 companies have a greater ability to deal with the IFRS for SMEs as they have a higher competitive advantage than do the others; in addition, their human resources are characterized with high experience as well as receiving training support from abroad. However, the researcher has pointed out that many of the accounting practitioners in Fiji companies prefer the old standards on the IFRS for SMEs and there are many reporting requirements that came in the IFRS for

SMEs have not yet been applied in Fiji because it cannot be applied to the financial reporting environment in Fiji. However, if the company decided to apply the requirements of IFRS for SMEs, it must take caution. Similarly, within the context of Fiji, Chand, Patel and White (2015) suggest that the guidelines provided by the IFRS for SMEs are insufficient to be used for the decision-making process due to the complexity of these standards.

Within the context of studies on global level, Gassen (2017) find that the cost and benefit of application of the IFRS for SMEs is varies among countries, and many studies support this suggestion. For instance, Bohušová and Blašková (2012) identify countries' characteristics that applied the IFRS for SMEs. The study finds countries that applied the IFRS for SMEs usually have a lower GDP per capita compared to developed countries with strong economies, and that the application of the IFRS for SMEs in these countries is linked to the weak economy, which could be attributed to these countries seeking access to finance and to foreign markets to improve their performance and their economic profile. Some examples of these countries are Ghana, South Africa and Kenya. Moreover, the study relied on the auditing strength index as a proxy for the quality of the financial reports to link it with the adoption process, and accordingly found that the levels of this indicator are low in countries that have implemented these standards. Further, the study found that developed countries whose financial reporting is characterized by high quality reject the choice of adoption of the IFRS for SMEs due to the high cost of applying these standards. Similarly, Kaya and Koch (2015) studied the factors affecting 128 countries' decisions to apply the IFRS for SMEs. The study finds that the countries that tend to apply the IFRS for SMEs are those that do not have the potential to apply the local GAAP. This further increases the likelihood of applying the IFRS for SMEs by private companies that are already required to adopt the full IFRS rather than the local GAAP. Additionally, countries whose institutional governance is of low quality are more inclined to apply the IFRS for SMEs. The study suggests that developing countries are more likely adopt

the IFRS for SMEs than are the developed countries, suggesting that developing economies, when implementing the IFRS for SMEs, could improve their economic profile by facilitating contracts with international organizations such as World Bank and the International Monetary Fund to obtain funds.

Quagli and Paoloni (2012), in their study of 15 countries, show that there is marked diversity among the views of preparers and of users. The results show that the users supported the application of the IFRS for SMEs, while preparers were opposed to the application of these standards. However, Perera and Chand (2015) state that if the user information needs are not considered clearly, SMEs will be more reluctant to apply the IFRS for SMEs as the cost will be greater than the benefit. Following a similar logic, Bertoni and Rosa (2013) discussed and highlighted the consequences of the probable implementation of the IFRS for SMEs in Europe. The researchers explained that the existence of more than one structure of the accounting regulation would contribute to increasing confusion among users, in addition to increasing the preparers' financial reporting cost. The researcher discussed also that the IFRS for SMEs could contribute to increasing the comparability feature of financial reports internationally, and this can be considered one of the most important benefits when implementing these standards. Additionally, there are several benefits that can be obtained from adopting these standards. For example, it might contribute to reducing the cost of capital, and it can also reduce many obstacles that may be faced by companies when they adopt the full IFRS. Likewise, Albu, et al.'s study (2013) of four developing economies (Hungary, Czech Republic, Romania and Turkey) found that the most important advantage that can be obtained at the global level is that IFRS for SMEs contributing to increasing the comparability, in addition to the fact that these standards add to improving the financial reporting. At the local level, they contribute to enhancing the business environment. Similarly, Perera and Chand (2015) finds that there are numerous countries that have not yet applied the IFRS for SMEs, and the study clarified that

this is due to many reasons or problems, including the burden incurred by these companies while applying these standards; moreover, at the national level there is no consistency in the reporting frameworks, not to mention the difficulties that occur during the adoption procedures, in addition to the difficulties inherent in many parts of these standards and the likelihood of more complexity, especially when preparing the financial statements.

After reviewing studies on the determinants and consequences of the IFRS for SMEs' adoption, the researcher can conclude that many factors contribute to the application of the IFRS for SMEs such as accounting culture, economic strength, the nature of the applied standards, the desire to obtain external financing, and the willingness to integrate into foreign markets. However, there are also several factors that limit the application, such as the lack of knowledge, the inadequate experience, the low level of education, the high cost incurred after the application, and the level of complexity in the application of these criteria. Further, the factors that contribute to the application of these criteria are the economic factor, that is, countries that are considered emerging economies or developing countries are more inclined to apply these standards because these countries seek to gain access to their markets in the global markets, it also seeks external funding from external government authorities, an example of these countries being South Africa, Ghana and Kenya, while developed countries with high-quality financial reports often avoid applying these standards because they will incur costs.

Overall, previous studies on the adoption of the IFRS for SMEs primarily and merely relied on interviews and questionnaires or provide country-level evidence of the adoption of IFRS for SMEs. For SMEs, the identification of accounting standards adopted at firm level, especially during or after the issuance of the IFRS for SME, was relatively difficult due to limited access to the SMEs' annual reports. This research adds to the stream of literature, such as Francis, Khurana, Martin, and Pereira (2008), by providing firm-level evidence on the SMEs' adoption of the IFRS for SMEs in the UK. Since FRS 102 is based on the IFRS for SMEs, i.e., our study

intends to add to the exiting literature on the adoption of IFRS for SMEs by providing firm-level evidence from a developed country via investigating the determinants and consequences of the adoption of the FRS 102 with a hand-collected dataset from their corporate accounts.

2.2 The new UK GAAP 'FRS 102'

As discussed previously, the option of implementing the IFRS for SMEs has been rejected by the EC (Kaya and Koch, 2015), and thus the IFRS for SME's "is not available for use in Europe" (FRC, 2017, p.185). SMEs in Europe, accordingly, followed either local GAAP or the full IFRS (Alp and Ustundag, 2009; Tyrrall, Woodward and Rakhimbekova, 2007). However, many SMEs have been struggling with the implementation of IFRS due to the costs incurred (see Section 2.1.2). Since the primary focus of this study is SMEs in the UK, the local UK GAAP will be considered.

The UK GAAP rulebook presently consists of 2,500 pages, and it is argued that the UK GAAP lack consistent rules as various changes conducted in the last years have made the UK GAAP closer to IFRS. Therefore, a need to update the old standards seems to be emerging to find realistic solutions for public interest, company size, information needs and the company's complexity. Additionally, the need to update the old UK GAAP has become a matter of interest, in particular for financial instruments since there are many common transactions still not recognized within the balance sheet (PWC, 2013a). Therefore, in 2012 the Accounting Standard Board (ASB) issued the revised financial reporting exposure drafts for (46) "Application of Financial Reporting Requirements" and (47) "Reduced Disclosure Framework" in addition to (48) "The Financial Reporting Standard applicable in the UK and Republic of Ireland" with the aim of giving a true and fair value of the financial position for the entity's and for the loss (expenditure) or profit (income). The draft states that the ASB revised the financial reporting standards and issued three drafts for the FRS (100), FRS (101) and FRS (102) (FRED, 2012. Part two).

In 2015, the Financial Reporting Council (FRC) revised financial reporting standards in the United Kingdom and Republic of Ireland. "*The revisions fundamentally reformed financial reporting, replacing the extant standards with five Financial Reporting Standards which are (1) FRS 100 Application of Financial Reporting Requirements. (2) FRS 101 Reduced Disclosure Framework. (3) FRS 102 The Financial Reporting Standard applicable in the UK and Republic of Ireland. (4) FRS 103 Insurance Contracts. (5) FRS 104 Interim Financial Reporting*" (FRS 102, 2015, P.5).

FRS 102 was issued with the aim of diminishing the intricacy and cost for organizations, while presenting a coherent and concise set of guidelines to empower the financial statement users' to receive financial reporting featured with the high quality and comprehensibility suitable for the company size and its complexity and the information needs of users. FRS 102 is based on the IFRS for SMEs, and it is the core among the above-mentioned standards as it includes new requirements for small entities in terms of goodwill and intangible assets, group-defined benefit schemes and deferred tax. FRS 102 was issued with the aim of meeting the needs of SMEs, to reduce the costs of disclosure, to create the homogeneity in the application of accounting standards SMEs. The scope of this standard contains many advantages that have contributed to reducing disclosure requirements for SMEs. For example, companies that adopted the FRS (102) have many exemptions in respect of the following disclosures: (1) reconciliation of the number of shares outstanding from the beginning to end of the period; (2) cash flow statement and related notes; (3) key management personnel compensation; (4) transaction with other wholly owned subsidiaries within the group. Accounting periods starting from 1st of January 2015 or afterwards are the period where entities shall start complying with the FRS 102, with early implementation permitted since or after 31 December 2012 (FRC FRS 102, 2015).

The next section (see Table 2.3) outlines the similarities and differences between the old UK GAAP, new UK GAAP 'FRS102', and IFRS.

Table 2.3: Differences between the Old UK GAAP, the new UK GAAP 'FRS 102', and IFRS.

Subject	The Old UK GAAP	The new UK GAAP (FRS 102)	IFRS
The presentation of the financial statements	The below items are required to be presented: - balance sheet - profit and loss account - statement of total recognized gain and losses - cash flow statement notes comprising of a summary of the accounting policies, estimations and additional information.	The same basic notes as in IFRS are required to be presented. However, the formats are based on company law. Furthermore, if the only differences in equity during the period resulted from profit or loss, the payment of dividends, correction of material errors in the prior period, or differences in accounting policy, then a combined statement of income and retained earnings can be displayed in place of both the statement of changes in equity and comprehensive income statement.	It requires: - A financial position statement. - A statement of comprehensive income (displayed either in a separate statement or an income statement supported by a statement of other comprehensive income). - A statement of cash flows. - A statement of changes in equity (presenting a reconciliation of equity items between the beginning and end of the period). - The notes.
Cash flow statement	Cash flows are disclosed under nine standard headings. Under these criteria, the movement of cash flow is required. The movement of cash under these criteria is defined on the basis of the total deposits that are paid on demand with cash available in hand minus the overdrafts. The concept of cash equivalents is not available.	The cash flow presentation is analogous to that under IFRS, presenting movements on cash and cash equivalents, and with fewer standard headings than under old UK GAAP. New UK GAAP includes some exemptions for developing a statement of cash flow, such as the exemptions under the old UK GAAP.	The presentation of the statement of cash flows differs significantly from the presentation in the old UK GAAP. The presentation under IFRS includes the movement in cash and cash equivalents. These are defined based on short-term investments which are characterized by high liquidity and are also readily convertible into known cash amounts and are subject to small risks of changes in value. IFRS does not contain any of the exemptions that permit many bodies not to provide cash flow statements under UK GAAP.
Financial Instruments	All companies are required to comply with the presentation requirements of the FRS 25 which are based on the International Accounting Standard 32 (IAS 32), in addition to the disclosure requirements of the company law. Depending on the company's situation, companies identify the model to be applied, be that the 'old pre-FRS 26 UK GAAP' model (FRS 13, FRS 4, and voluntarily, FRS 29) or the 'FRS 26' model (FRS 26 & 29). This is based on the firm's condition, in specific its listing status, and if it adopts the fair value accounting practices of corporate regulation. FRS 26 is based on IAS 39, which differentiates between four measurement groups for	There are two main sections dealing with financial instruments, especially under the new UK GAAP. The first section is Section 11, which deals with simple issues related to both accounts receivable, payable and other financial instruments. The second section is Section 12, which deals with more complex matters for financial instruments. Under the new UK GAAP, the amortized cost is used to measure the financial instruments, whereas issues regarding the complex financial instrument are most commonly measured by fair value by profit or loss. Being the impairment model available in FRS (102), it is also possible for the new UK GAAP to apply the measurement requirements of both IAS 39 and IFRS 9 instead	Both IAS 3 and 39 are the same as the old UK GAAP for entities that report FRS 26 as FRS 26 is highly relied on the IAS 39. All firms are required to adopt both IAS 32 and IAS 39. IAS 39 is being replaced by IFRS 9. New guidelines concerning the measurement and classification of financial assets and liabilities have been produced, and they experience a better change in comparison to IAS39. The other phases of IFRS 9 on general hedge accounting, impairment, and macro hedge

	financial assets, which are: - financial assets at fair value through profit or loss; - held-to-maturity investments (measured at amortised costs); - loans and receivables (measured at amortised costs); and - available-for-sale financial assets (measured at fair value). Note: Financial instruments are measured at amortised cost for firms that do not follow FRS 26.	of section 11 and 12. Note: both hedging and impairment models in FRS 102 relied on the basis of IAS 39, although some differences are available in the application process. FRS 102 will be updated by the FRC when IFRS 9 is complete.	accounting have not been settled.
Expense recognition	First, in terms of research costs, they are treated as expenses at the moment they are incurred. Secondly, in terms of development costs, they are amortized and capitalized if particular conditions are met (e.g., accounting policy choice). Thirdly, regarding the borrowing costs, they are capitalized if particular conditions are met.	Under this standard, all research costs are identified as an expense. In terms of development cost and borrowing cost, they are capitalized as an accounting policy choice if particular conditions are met.	Analogous to the old UK GAAP, except that development costs capitalization is compulsory when capitalization principles are reached.
Retirement benefits-defined benefit plans.	FRS 17 is concerned solely with retirement benefits and does not focus specifically on other employee benefits. Defined benefit plan liabilities are measured on an actuarial principle, utilizing the estimated unit credit process. Plan assets are measured at fair value. Losses and the actuarial gains are recognised in the statement of total recognised gains and losses in the period they occur. There is an exception for group established benefit plans such that, in particular cases, all entities in the group can use their presence in the plan as if it were an established improvement plan.	FRS 102's domain is broader than old UK GAAP. All employee benefits (except share-based payments) are in purview. For calculating defined benefit plan liabilities, the estimated unit credit scheme is needed. Plan assets are measured at fair value. FRS 102 covers the alterations to IFRS (LAS 19 (amended)) for detailed benefit pension systems which alter the system of determining net interest. Re-measurements of the net defined benefit liability (that is, actuarial gains and losses) are recognised in full, immediately in other comprehensive income. The accounting for group defined benefit plans differs from old UK GAAP: the cost of a defined benefit project is recognised in the financial statements of the group body, that is, lawfully the sponsoring employer for the project if the net described benefit costs is not apportioned to alternative bodies in the group.	IAS 19 (amended) substitute IAS 19 for annual terms starting on or after 1 January 2013. (`LAS 19' refers to the preceding version and `LAS 19 (amended)' deals with the contemporary standard.) The domain of IAS 19 and LAS 19 (modified) is the same as FRS 102. The estimated unit credit system is demanded for determining defined benefit liabilities. Plan assets are measured at fair value. Losses or actuarial gains under LAS 19 can be recognised directly (either in other comprehensive income or profit and loss) or, in some cases, amortised into profit or loss over the predicted remaining working lives of engaging workers. LAS 19 (modified) is analogous to the new UK GAAP: actuarial gains and losses are merely recognised instantly in other comprehensive income. Also, LAS 19 (modified) shows a difference to the process of determining net interest on the net defined benefit liability or asset contrasted to the conditions under LAS 19. For group-defined benefit plans, the net-defined benefit cost is recognised in the financial statements of the group

			entity that is lawfully the sponsoring organization for the project, if the net defined benefit costs are not apportioned to other bodies in the group.
Deferred tax	Deferred tax is identified on the premise of timing differences (with special exemptions), utilizing the incremental liability approach - timing differences are the differences between a taxable firm's profit and its proceeds as presented in the financial statements. This is a method that is fundamentally distinct from IFRS. Deferred tax assets are recognized as the amount that can be retrieved (i.e., it is more likely than not that there are proper tax profits from which the future reversal of timing differences can be discounted).	Deferred tax is identified on the premise of timing differences, with supplementary recognition conditions for some other differences ("time differences plus" method). This method calls for deferred tax recognition for timing differences when revaluing assets, assets (excluding goodwill) and liabilities resulting from a business combination. The principles for recognizing deferred tax assets are analogous to the old UK GAAP.	Deferred tax is identified on the premise of temporary differences. Temporary differences are the differences between the carrying amount of liability or asset in the financial statements and its tax principle (i.e., the extent that the enterprise predicts will influence taxable profit when the carrying amount of the liability or asset is recovered or settled). Deferred tax is not recognized when a temporary difference occurs on the original recognition of liability and asset in an activity that is not a business combination and does not influence the accounting profit or taxable profit at the time of the transaction. The principles for recognizing deferred tax assets are analogous to the old and new UK GAAP.
Tangible and intangible fixed assets	A cost or valuation model may be applied for tangible fixed assets. Likewise, a cost or valuation model may be applied for intangible assets, but a valuation model may merely be applied where an intangible asset has an easily verifiable market value. There is a rebutTable assumption that intangible assets and goodwill have a useful life of twenty years. Goodwill with an undetermined life is not amortised. Any goodwill that is negative is recognised in profit or loss in the times in which the non-financial assets are restored, with any surplus recognised over the period predicted to benefit. Goodwill and other intangibles with useful lives of more than twenty years are investigated in each year for impairment. Non-financial assets are checked for impairment, particularly where there is a sign of impairment.	The cost or valuation model can be applied for tangible and intangible fixed assets. It presumes that all intangible assets, consisting of goodwill, have a limited life and are amortized. The useful life is 5 years if the firm is incapable of carrying out a solid assessment. Non-financial assets are investigated for impairment only when there is a sign of impairment. Negative goodwill is identified in profit or loss in the periods in which the non-financial assets are restored, with any surplus identified over the period from which it is supposed to benefit.	For intangible and tangible assets, there is an accounting principle option between a revaluation (fair value) and model cost model. Other intangible assets and goodwill with indefinite lives are evaluated in each year for impairment and are not amortized. Non-financial assets with limited lives are amortized and assessed for impairment, particularly when there is a signal of impairment. Negative goodwill is recognized instantly. Note: UK businesses that report under FRS 101 RDF (IFRS) must look at whether the non-amortization of goodwill is a fair override of the Companies Act 2006 and valid. Any negative goodwill is identified in profit or loss in the periods in which non-cash assets are to be redeemed, with any surplus recognized over the period from which they are predicted to benefit.

Investment properties	Investment properties are introduced in the balance sheet at the open market value (through the statement of total recognised gains and losses). The cost model is not accepted.	Investment property is displayed at fair value (through profit or loss) if this fair value can be determined without unreasonable effort or cost; otherwise, it is determined at cost within `Property, plant and equipment'.	IFRS: IAS 40, 'Investment property', introduces an option between the cost method and the fair value (through profit or loss).
Assets held for sale	Assets held for sale are not covered; the choice to sell an asset is recognized an impairment indicator.	Assets held for sale are not covered; the choice to sell an asset is recognized an impairment indicator.	IFRS 5, non-current assets held for sale and discontinued operations calls for non-current assets to be recognized as held for sale where the carrying amount is recovered generally through a sale transaction instead of the continuing use.
Business combination	Directly attribuTable transaction costs are incorporated in the acquisition cost. The acquisition cost should have a reasonable assessment of the present value of contingent consideration predicted to be settled in the subsequent years. The acquisition cost is altered when revised projections of amounts proposed to be settled in the future are made. In some cases, merger accounting is employed.	Analogous to old UK GAAP. Transaction costs are incorporated in the acquisition cost. Contingent consideration is incorporated as part of the cost of acquisition if it is possible that the amount will be settled and that it can be determined accurately. The acquisition cost is altered when modified projections of amounts predicted to be settled in the future are made. In some cases, merger accounting may be employed.	Transaction costs are expensed. Contingent consideration is recognised, regardless of the probability of payment. Contingent consideration that is labelled as an equity instrument is not re-measured. Changes in contingent consideration that is labelled as a financial liability are recognised in profit or loss.
Investment in associates and joint ventures	Investments in associates are normally accounted for by applying the equity rule in consolidated financial statements. Investments in associates and joint ventures utilise the fair value or the cost model in separate financial statements. Investments in joint ventures are accounted for applying the 'gross equity' scheme, which is a scheme of equity accounting. with additional disclosures in the profit and loss account and balance sheet.	Investments in associates are commonly accounted for applying the equity rule in the consolidated financial statements. A non-parent investor can account for all of its investments in associates applying either the fair value model (with gains identified either through profit or loss, or through other comprehensive income) or the cost model.	Investments in associates are accounted for applying the equity rule. For accounting for a jointly controlled entity, either the equity method or the proportional consolidation method is permitted under IAS 31, but merely the equity rule can be applied under IFRS 11. Fair value cost models are commonly not permitted.

Source: Similarities and differences: A comparison of current UK GAAP, new UK GAAP (FRS 102) and IFRS (PWC, 2013b).

The prior impact of FRS 102 on the qualitative qualities of financial information required by creditors is not clear yet. For instance, debt, in contrast to equity, is more sensitive to drops in the company's value than to increases. As a result, debtors have a higher demand for negative information (Ball, Robin and Sadka, 2008; Ball, Bushman and Vasvari, 2008). Furthermore, lenders assess borrowers' ability to service loans based on the book value of their assets. Debt holders, unlike equity holders, have a greater priority in the event of bankruptcy, and they

collateralize the company's assets due to security requirements. Debt holders, it could be argued, require current but credible asset valuation estimations (Watts 2003). FRS 102's implementation resulted in significant modifications to accounting rules and financial statement features (PWC, 2013). As a result, FRS 102 could have an impact on loan providers' financing decisions based on financial statement data. To illustrates, on the one hand, being the impairment model provided in FRS (102), this could speed up the recognition of bad news. Further, since the requirements of IAS 16 are similar to those required by FRS 102 such as the historical cost asset measurement, this could improve the reliability of the data presented in the financial statements, and thus FRS 102 would facilitate debt financing. On the other hand, FRS102 might also apply the measurement criteria of both IAS 39 and IFRS 9, which may lessen accounting conservatism and throw doubt on the trustworthiness of financial data. In this scenario, FRS 102 may obstruct debt providers' decision-making. In conclusion, FRS 102's implications related to debt financing are an empirical question that are worthwhile to be investigated.

To note how the adoption would change the presentation of financial information of SMEs, the main differences between old UK GAAP and new UK GAAP, particularly with regard to company accounts will be spotted. Thus, the researcher had to find a firm that had implemented FRS 102 in a particular year such as 2016 and manually collected the report for 2015 and 2016. The presentation of the financial information in the report of 2015 for the year 2015 has been compared with those reported in the report of 2016 for the year 2015 as a transition year. Appendix A shows the differences in terms of the main numbers of both the statement of the financial position and the statement of comprehensive income under the old and new UK GAAP " FRS 102". The results indicates that the transition from the old UK GAAP to the new UK GAAP " FRS 102" had resulted in a change in total assets, total liabilities, total equity, and the total comprehensive income. Further, the researcher also noted that there were disclosed

items under the report of the year of adoption of FRS 102 are not available in the previous year report (i.e., under the old UK GAAP). For instance, both interest receivable and similar income, and fair value gains and losses on investment properties. In conclusion, this is in line with the conclusion derived from PWC (2013) that FRS 102 brought substantial differences in comparison to other standards such IFRS and old UK GAAP which in turn affects the methods of valuing assets and liabilities, and consequently affects the financial position reporting (FRC FRS 102, 2015), and hence affect the finance decision.

2.3 Overview of the Relevant Theories

In this part, the theories that are relied upon in this research will be presented. Despite the availability of various theories that can be used, some of the theories in prior studies conducted in private firms are used to answer the research question assigned to each paper. For instance, the first paper focused on the determinants of FRS 102 adoption from the lens of SMEs in the UK. Prior studies on the level of listed firms, factors that drive firms to comply with the full IAS/IFRS, such as leverage, firm size, auditor type, ownership diffusion, profitability, industry sector, internationality and foreign listing, were explained by agency theory, signaling theory, political process theory and capital need theory, (Dumontier and Raffournier, 1998; Tarca, 2004; Karim and Ahmed, 2005; Cuijpers and Buijink, 2005; Al-Shammari, Brown and Tarca, 2008; Samaha and Stapleton, 2009; Al-Akra, Eddie and Ali, 2010; Al Mutawaa and Hewaidy, 2010; Fitó, Gómez and Moya, 2012; Bova and Pereira, 2012; Şenyiğit, 2014; Samaha and Khlif, 2016), whereas in studies conducted in unlisted/private firms, the determinants of the full IFRS such as the above-mentioned characteristics are explained by agency theory and signaling theory (Francis, et al., 2008; André, Walton and Yang, 2012; Matonti and Iuliano, 2012; Yang, 2014; Bassemir, 2018). Therefore, it can be observed that theories handled in previous studies assigned to listed companies were not all employed in studies concerned to private enterprises. This might be consistent with Francis, et al. (2008) who assert that our

knowledge of firms' activities, as well as the role played by accounting in private firms, is limited. Therefore, the theories used in private firms are different from those used in listed firms. Hence, the theories mentioned or used in studies on private firms are followed.

As mentioned earlier, this research is mainly concerned with studying two main parts, the first is the determinants or SMEs' incentives to adopt the FRS 102 standard, and the second is the consequences of adopting these standards. Specifically, the first paper is devoted to studying the first part of the research (i.e., determinants), while the second and the third papers are devoted to studying the second part of the research (i.e., consequences). The first paper of this research relied on the agency and signaling theories, whereas the second and third paper relied on the positive accounting theory's hypotheses (i.e., debt covenant violation hypothesis), the hypothesis of agency theory (i.e., control hypothesis), financing advantage and transaction cost theories of trade credit in order to answer the research questions. These theories are presented below:

2.3.1 Theoretical underpinning of the first empirical chapter (Chapter 3)

- Agency Theory

Adam Smith may have been one of the first to speculate the agency problem, and since then it has become a catalyst for economists to develop prospects of agency theory (Panda and Leepsa, 2017). The existence of agency issues has been broadly recognized in various academic fields such as in accounting (Ronen and Balachandran, 1995; Watts and Zimmerman, 1983) finance (Fama, 1980; Fama and Jensen, 1983; Jensen, 1986), economics (Jensen and Meckling, 1976; Ross, 1973; Spence and Zeckhauser, 1971) and other different fields.

Agency theory focuses on the issue and solution of the agency problem (Ross, 1973; Jensen and Meckling, 1976). Specifically, this theory is interested in dealing with two issues that can take place in agency relationships. The first problem occurs when (a) there is a conflict between

the targets or desires of the shareholders (i.e., principal) and the manager (i.e., agent) and when (b) it is problematic or costly for the principal to ascertain what the agent is essentially performing. The problem here is that the manager cannot verify that the agent has acted appropriately. The second problem is risk sharing which arises when attitudes towards risk are different for both the principal and the agent, and here the problem is that the principal and agent may choose various actions due to different risk signals (Eisenhardt, 1989).

Furthermore, the existence of a separation between operational control of the business and ownership contributes to the agency problem, and shareholders may find it difficult to assess whether managers have fulfilled their contractual duties and obligations due to the potential for moral hazard arising from the asymmetry in information (Jensen and Meckling, 1976). Thus, mitigating the issue of information asymmetry between investors and managers is one of the ways to mitigate the problems arising from the agency relationship (Leung and llsever, 2013). Likewise, the financial information disclosure and the accounting choices of managers have been reviewed using agency theory, which considers that disclosure and accounting choices are utilized to lessen agency costs and thus the information asymmetry that lies between agents and principals. Compliance with accounting standards such as IAS/IFRS is one of the means to reduce information asymmetry and thus alleviate the conflicts of interest between the two parties (Samaha and Khlif, 2016).

Agency theory proposes various variables to explain the extent of compliance with the accounting standards (IAS/IFRS). For instance, leverage, firms' size, ownership diffusion, and auditor type have often been hypothesized to influence compliance with IAS/IFRS by affecting the volume of agency costs (Karim and Ahmed, 2005; Samaha and Stapleton, 2009; Al-Akra, Eddie and Ali, 2010). However, the implied perception of accounting theories in private companies as compared to listed companies might be varied. For instance, the problem of the agency in private firms is not as it is in listed companies, as private firms are involved in setting

a contractual association with external parties (Francis, et al., 2008), through employing private information channels to settle the dilemma of information asymmetry between the main contracting bodies and the related company (Ball and Shivakumar, 2005; Burgstahler, Hail and Leuz, 2006; Hope, Thomas and Vyas, 2013; Bassemir, 2018). Therefore, given FRS 102 was issued to increase the quality, transparency, and compatibility of the financial reporting, which could alleviate the issue of information asymmetry between parties, agency theory will be relied on to explain the degree of compliance with these standards from the perspective of SMEs in the UK.

- *Signaling Theory*

Spence (1973) established signal theory to explain behaviour in labour markets. Signal theory is advantageous for illustrating behavior when two sides (individuals or organizations) have access to various information. Usually, one party, the sender, must determine whether and how to reach out (or post a signal) that information, and the other party, the receiver, must determine how to explain the signal (Connelly, et al., 2011). Signaling is a common phenomenon pertinent in any market with information asymmetry (Morris, 1987); signaling theory is mainly interested with alleviating information asymmetry between two parties (Spence, 2002) by signaling more information to others (Samaha, Khlif and Dahawy, 2016). Management academics have studied signaling theory to explain the effect of information asymmetry in a broad range of research contexts. For instance, a study conducted by Zhang and Wiersema (2009) demonstrates how CEOs signal the unobservable quality of their companies to possible investors through the noticeable quality of their financial statements. Using the signaling theory within the context of financial disclosure indicates that managers can use financial statements to signal their prospects and aims. Conformity with accounting standards such as IAS/IFRS may signal to market parties that the company is willing to use further specific accounting standards, or to disclose more information (Samaha and Khlif, 2016). Indeed, the adoption of

international standards could signal to market parties that the company is committed to publishing more information to investors, absorbing international capital infusion, and listing on foreign exchanges (Hope, Jin and Kang, 2006). Morris (1987) points that some of the conditions mentioned in the agency theory are consistent with those mentioned in the signaling theory. However, a necessary condition of signal theory, informational asymmetry, is not experienced by agency theory (although it is involved), and therefore is not identical, i.e., one is not signified by the other. Morris (1987) points that given this harmony between signaling and agency theory, it is possible to merge them to form prospects about accounting choices. Therefore, Samaha, Khlif and Dahawy (2016) recommend using both theories to acquire a deeper insight into why businesses comply with IAS/IFRS.

Signaling theory proposes various variables to explain the extent of compliance with the accounting standards (IAS/IFRS). For instance, leverage, liquidity and profitability have often been hypothesized to influence compliance with IAS/IFRS by affecting the information asymmetry in the market (Karim and Ahmed, 2005; Samaha and Stapleton, 2009; Al-Akra, Eddie and Ali, 2010; Samaha, Khlif and Dahawy, 2016). Thus, following the same logic, signaling theory will be examined via investigating specific factors that could affect the level of SMEs' compliance with FRS 102 in the UK.

2.3.2 Theoretical underpinning of the second empirical chapter (Chapter 4)

- Positive Accounting Theory-debt covenant hypothesis

Watts and Zimmerman first introduced the concept of Positive Accounting Theory (PAT) in (1978) to explain management's discretion regarding policies and choices related to accounting. The PAT literature addresses policy and contractual factors to demonstrate management's discretion of accounting options in the presence of information asymmetry and agency conflict (Healy and Palepu 2001). The prime theme in positive accounting theory is the choice of accounting method. Conceptually, the work underlines determining the events that provide a

specific option of financial accounting scheme. Empirically, the work concentrates on the financial accounting method as a dependent variable (Demski, 1988).

Jensen (1976) states that PAT is conducted to justify why accounting is what it is, why accountants prefer to do it and what affects these circumstances have on the use of people and resources. Watts and Zimmerman (1990) point out that the role of accounting theory is to bring interpretations and prospects for accounting processes, and most studies of accounting choices presume that managers favour several accounting practices to transmit wealth to themselves at the expense of another body to the company, as they can choose the company's contracts as they are and thus decide the incentives for managers for accounting choice.

PAT in general points out how management utilize methodical means and accounting information to manipulate management profit by selecting specific accounting methods. and This mainly uses three different hypotheses: bonus plan hypothesis, debt covenant hypothesis, and political cost hypothesis (Baig and Khan, 2016). In this research, particularly in the second paper, the focus is on debt hypothesis, which is used to test the relationship between leverage and earnings management.

The debt covenant hypothesis is one of the main valid implications of PAT (Watts and Zimmerman 1986; 1990). Managers have incentives, according to this hypothesis, to establish financial reporting decisions that lessen the possibility of breaching accounting-based covenants in their companies' debt agreements (Dichev and Skinner, 2002). The effectiveness of these incentives relies on the costs of breaching the debt covenants of the firm, that is, on the technical default costs (Smith and Warner 1979; Hothausen and Leftwich, 1983).

PAT suggested several conditions in which management is more prone to manage earnings, including when companies are about to breach debt covenants (Duke and Hunt, 1990; Press and Weintrop, 1990). The motive behind managing earnings related to breach of debt

agreement is the agent's (i.e., manager) compensation contract. This contract was formed to focus on the conflict between shareholders and bond holders and to have the least potential cost to the agency. Usually, based on accounting figures, the company initially selects the optimal compensation contract, in order to reduce agency costs that may emerge from separating control (managers) from ownership (shareholders). Also, there may be other commitments for managers to manage reported values such as the ratio of earnings to total debt above the contractual limit. These limits, generally called debt-covenants, are set by the company's lenders to cut down the monitoring cost (Garleanu and Zwiebel, 2009; Jha, 2013). Some discretion over how earnings are reported rests with managers, so the issue of managing earnings around debt covenants is important. This is in part to give directors such discretion because it is unreasonable to conclude a contract voiding such discretion, and it may be preferable, sometimes, for shareholders to give managers some discretion. Thus, managers manage earnings (Demski, Patell and Wolfson, 1984; Jha, 2013). Managers are more likely to make the company's profits higher than the actual profits, especially when the company is close to violating the debt covenant, by transferring the profits from the forthcoming period to the present period (Watts and Zimmerman, 1978).

In contrast to the above-mentioned hypothesis, there is a hypothesis called the control hypothesis developed by Jensen (1986), and it will be explained in the next section.

- *Agency Theory-Control Hypothesis*

"The agency costs of debt have been widely discussed, but the benefits of debt in motivating managers and their organizations to be efficient have been ignored. I call these effects the "control hypothesis" for debt creation" (Jensen, 1986, p.3).

Corporate managers are shareholders' agents, a relationship replete with conflicting interests. Agency theory, that is, the analysis of such conflicts, has now become a considerable part of

the research in the field of economics. Paying cash compensation to shareholders leads to significant conflicts that have not received much consideration. However, pay-outs to shareholders lessen the authority of the managers and increase the likelihood of them bearing the control of the capital markets which takes place when the firm has to acquire new capital. Financing projects internally serves to avoid this oversight and the possibility that funds may not be available or are only available at high explicit rates. Thus, monitoring through the company's internal control system and the corporate control market is essential (Rozeff, 1982; Easterbrook, 1984; Jensen, 1986).

Control hypothesis proposes that, with investor and creditor scrutiny, debt financing mechanism is effective in lessening opportunistic behaviours of managers; in addition, contractual debt repayment obligations have an inadequate level of free cash flow usable, which reduces manager's discretion on sub-optimal projects (Jensen, 1986). However, when managers have to commit to principal and interest payments, the role of debt control emerges, and this indicates that leverage can restrict managers' ability to do receivables manipulation that would increase income (Zamri, Rahman and Isa, 2013). This suggests that companies face increased scrutiny by creditors and bankers when debt levels are high. Thus, the use of positive discretionary accounting accruals is precluded. For companies burdened with debt, it may be beneficial for banks to incur monitoring costs in order to evaluate the true quality of the debtor when debt restricts opportunistic behaviour. Leverage has been recognized to interest more monitoring and scrutiny from external creditors, and such monitoring should be extrapolated to an external party with investment interest in the company, such as equity investors. This is because higher levels of leverage ought to end up with increased credit risk for the company and an increased probability of future unpaid debt obligations. This higher risk can make creditors incur the necessary monitoring costs to assess the true quality of debtors, resulting in increased external monitoring by creditors (Rodríguez-Pérez and Van Hemmen, 2010;

Anagnostopoulou and Tsekrekos, 2017). Hence, it is unlikely for companies' managers to manage earnings due to being subject to control and monitoring, especially companies with high leverage (Dewi, Anggraeni and Wardhani, 2017).

In general, there are two aspects that the results of the study will show. Firstly, the results will either be consistent with the debt covenant hypothesis or with the control hypothesis, i.e., either the SMEs in the research sample tend to manipulate their profits in order to keep debt covenants not violated (i.e., positive relationship between EM and leverage) or leverage levels are monitored by external creditors, and thus earnings are difficult to manipulate (i.e. negative relationship between EM and leverage). Secondly, these hypotheses will be tested before and after the adoption of the FRS 102 standard in order to monitor the extent to which these standards affect these hypotheses.

2.3.3 Theoretical underpinning of the third empirical chapter (Chapter 5)

Trade credit theories are numerous, and they depend on the incentives that drive trade credit activities. Dary and James (2020) mention that the theories of trade credit are generally divided into three broad theories: the first is the financing theories which include several specific theories such as financing advantage theory-information, liquidation, liquidity and financial distress, monetary policy (Schwartz, 1974; Emery, 1984; Meltzer, 1960). The second is the transaction/operational theory (Ferris, 1981; Emery, 1984). The third broad theory is the commercial theories which includes specific theories such as marketing, market power and competition theories (Nadiri, 1969), the price discrimination theory (Brennan, et al., 1988), the quality guarantee/verification theory (Smith, 1987; Long, Malitz and Ravid, 1993), the long-term relationship theory (Long, Malitz and Ravid, 1993; Summers and Wilson, 2000) and the tax theory (Brick and Fung, 1984; Brennan, et al., 1988).

The previous studies mentioned in paper 3 have been followed, and both financing theories and the transaction theory are relied upon to answer the research question for paper 3.

- *Financing Theories*

The financing advantage theory-information presumes that financial intermediaries have the potential to engage in financial intermediation at lower transaction costs, and thus have an informational advantage over conventional financial intermediaries. Suppliers obtain information about their customers as an aftereffect of their tight proximity and everyday communication, which makes it cheaper and smoother for them to determine the creditworthiness of their customers in advance and to check and impose credit contracts later on. In cases of default, suppliers can take appropriate action due to their ability to determine whether the delay or default in payment was intentional or not. Moreover, the process of collecting information for suppliers is easy and inexpensive because suppliers deal with relatively homogeneous customers compared to a heterogeneous bank customer portfolio (Petersen and Rajan, 1997; Emery, 1984; Ng, Smith and Smith, 1999; Dary and James, 2020).

Asset liquidation theory states that since buyers and suppliers work within the same or analogous value chains, companies have the ability to take over borrowers' assets and liquidate them at a lower transaction cost in cases where the borrowers are late in payments, and this in itself is an advantage for these companies over traditional financial intermediaries (Emery, 1984; Peterson and Rajan, 1997). The liquidity theory focuses on suppliers who have high levels of liquidity and who invest in trade credit in order to obtain returns. According to Schwartz (1974), companies that have cheaper and easier entry to credit in the capital markets may have a stimulus to borrow and thus use the money to finance clients' purchases of for whom credit may be rationed. This is identified as a 're-distributional' character of trade credit. In a tight monetary policy regime, interest rates rise and credit rationing increases, reducing

firms' capability to approach credit from the capital markets. Thus, companies subject to the credit rationing system will rely more on their suppliers to promote their purchases. Accordingly, the use of trade credit will increase under the strict monetary policy rule, and vice versa (Meltzer, 1960; Schwartz, 1974; Dary and James, 2020).

The literature has come up with two fundamental aspects for the presence and use of trade credit as a 'financial aspect' and a 'business aspect' (Psillaki and Eleftberiou 2015; Wang, et al., 2020). The financial view indicates that suppliers of trade credit may have advantages over bank lenders in terms of: 1) rescuing values on repossession in case of settlement delinquency; 2) perceived potential for customer default, 3) credit risk evaluation (Jain, 2001, Longhofer and Santos 2003; Cunat, 2007; Wang, et al., 2020). The business aspect views trade credit as a method to lessen the cost of transaction, to enable credit affluent suppliers to fund customers, to enforce price discrimination because the various credit terms granted essentially differ in the symbolical prices of clients, to provide implied quality guarantees, particularly for firms or new products on the market (Emery and Nayar 1998; Marotta 2005; Fabbri and Klapper 2008; Wang et al., 2020). Also, financially constrained companies tend to use trade credit to improve their image and credibility in obtaining bank credit (Yang, 2011).

In addition to the above-mentioned important features related to trade credit compared to bank credit, there are two hypotheses used in previous studies to explain the nature of the relationship between trade and bank credi: the Substitution and the Complementary hypotheses. The Substitution hypothesis suggests that that when bank lending is tight or costly or the company has less access to bank credit, then trade credit is an alternative for bank credit (Carbo-Valverde, Rodriguez-Fernandez and Udell, 2016), while the complementary hypothesis suggests that firms use trade credit as a financial instrument to obtain bank credit (Palacin-Sanchez, Canto-Cuevas and di-Pietro, 2018). Hence, the researcher will test these hypotheses

from the lens of SMEs in the UK, particularly after issuing FRS 102 as a proxy of accounting quality.

Transaction Theory

The use of trade credit can reduce the transaction cost of paying invoices, it is possible for the buyer to collect the costs of invoices or their obligations and pay them either monthly or annually, instead of paying them each time the goods are delivered. This helps the company split the shipment schedule from the payment cycle. The transaction cost theory is also available in other forms, as there may be intense periods in the consumption standards of the company's products. The company may resort to the formation of large inventories in order to sustain smooth production cycles, and this may result in two types of costs, the first cost related to storing inventory and the second cost related to financing this inventory. Indeed, the company can affect early sales by lowering prices, but in return, there can be a loss in discretionary capacity in addition to the existing cost. By providing trade credit selectively, both across clients and over time, a company may be prepared to better regulate the position of its inventory. Thus, the company can cut storage costs, principally if clients have a better capability to bear its inventory (Ferris, 1981; Emery, 1987; Petersen and Rajan, 1997).

Given this theory, there can be costs related to the transaction. To illustrate, the buyer usually seeks to confirm the quality of the goods provided by the seller during the purchase of goods, but the seller also seeks to ensure the creditworthiness of the buyer and, within this context, it is possible for both the seller and the buyer to incur several transactions costs related to obtaining information for the purpose of assessing the risk associated with transactions when market information is imperfect (Smith and Schnucker, 1994; Petersen and Rajan, 1997; Wilson and Summers, 2002). However, firms with a high quality of financial reports (i.e., a low level of information asymmetry) that have easy access to the financial markets, in comparison to firms that are financially constrained, have the ability to supply financial

resources to other firms (Schwartz, 1974), and thus the availability of financial resources from banks have contributed to the intermediary role played by the firms via borrowing credit from banks and supplying it to their customers (Deloof and Overfelt, 2011). Accordingly, the relationship between trade credit granted and bank credit received will be examined from the perspective of UK SMEs. Moreover, this relationship will be evaluated before and after the issuance of FRS 102 to see if the intermediary role that companies can play between obtaining financing from banks and then granting credit to customers may be affected by these standards that have the aim of increasing the quality of financial reports, transparency, and comparability.

Chapter 3 Paper One

'To be or not to be' –Adoption of FRS 102 by UK SMEs

Abstract

Amidst initiatives to promote global compliance with the IFRS for SMEs, the FRS 102 *The Financial Reporting Standard applicable in the UK and Republic of Ireland* was issued to replace the old UK GAAP in 2015. SMEs in the UK have since started adopting FRS 102, which was broadly based on the IFRS for SMEs. This provides a unique setting to examine the adoption of IFRS for SMEs in the UK. Using a dataset of 248 SMEs across 10 years, with 2,121 annual reports collected from FAME, we examine the factors driving the sample SMEs towards adopting FRS 102. The discrete hazard model is used, as these SMEs have not switched to FRS 102 simultaneously. Our findings suggest that the sample SMEs with a higher ex-ante leverage level are less likely to adopt FRS 102. This implies that the sample SMEs with a higher level of long-term debt would have already established their private communication channel with the creditors, and their financial reports are less relied upon by the creditors. The adoption of FRS 102 is significantly associated with firms' growth prospect, audit quality of their financial statements, and their industry classifications.

Key words: IFRS for SMEs; FRS102; Discrete Hazard Model.

3.1 Introduction

Prior to the inception of the International Financial Reporting Standards (IFRS) for Small and Medium-sized Enterprises (SMEs) in 2009, SMEs were following either their national GAAP or IFRSs in compliance with the laws of individual jurisdictions (Tyrrall, Woodward and Rakhimbekova, 2007; Alp and Ustundag, 2009). Under pressure from various external parties, the International Accounting Standards Board (IASB) added the IFRS for SMEs on its agenda (Ram and Newberry, 2013). On 9 July 2009, upon the global request from both developed and developing economies, the IASB issued the IFRS for SMEs as a simplified version of the full IFRSs with a measurable reduction in the disclosure requirements and measurement principles to suit the specific needs of financial reporting for the SMEs (IASB 2009a; Jermakowicz and Epstein, 2010; Perera and Chand, 2015).

With the full IAS/IFRS applied across many countries around the world to improve financial reporting comparability, transparency, and enhancing the market efficiency, numerous studies have focused on the adoption of the full IAS/IFRS by public listed firms, private firms and SMEs[9] (Francis, et al., 2008; Oliveira, Rodrigues and Craig, 2010; Cairns, et al., 2011; Matonti and Iuliano, 2012; Tsalavoutas, André and Evans, 2012; André, Walton and Yang, 2012; Iatridis, 2012; Yang, 2014; Bassemir, 2018). IFRS for SMEs adoption has, however, remained debatable and has so far proven to be popular only in developing countries but not for developed economies (Perera and Chand, 2015). With the trend towards IFRS for SMEs remaining controversial, different nations resort to various endeavours in order to converge. The United Kingdom (UK) has always played an active role here. For instance, in 2015 the Financial Reporting Council (FRC) rolled out the Financial Reporting Standard ((hereafter referred to as FRS 102)) which is based on the IFRS for SMEs and is applicable in

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[9] Not all private firms are SMEs. What distinguishes SMEs from private firms, particularly in Europe, is that there are specific criteria related to the staff headcount, turnover and balance sheet total that should be met to be categorised as an SME. The list of criteria was issued and revised by the European Commission in 2003 and in 2015.

the UK and the Republic of Ireland.[10] FRS 102 introduces new requirements for small businesses, and among the major changes that they have brought about is the recognition and measurement of financial instruments (FRC FRS 102, 2015). Consequently, the introduction of several options for the evaluation of financial instruments under FRS 102 will lead to a change in the valuation of assets and liabilities and, accordingly, a change in the reporting of financial position. Since FRS 102 includes new provisions for small entities and SMEs make up over 99% of all businesses in the UK (Rhodes, 2019), this makes the UK an interesting setting to examine the determining characteristics that drive SMEs towards the adoption of new accounting standards.

Further, previous studies on the adoption of IFRS for SMEs, such as Kaya and Koch (2015), Zahid and Simga-Mugan (2019), and Damak-Ayadi and Sassi (2020), primarily use country-level data and rely on interviews, questionnaires and content analysis. Additionally, other studies, such as Evans, et al. (2005), Atik (2010), Maseko and Manyani (2011), Adetula and Owolabi (2014), Perera and Chand (2015), and Arafat, Dunne and Ahmed (2020), set out to discuss theoretical issues relating to the application of the IFRS for SMEs. More recently, with rising interest in issuing specific regulations on financial reporting for private entities/SMEs, firm-level data has become publicly available (Bar-Yosef, D'Augusta and Prencipe, 2019). The inception of FRS 102 can be regarded as an endeavour towards converging to the IFRS for SMEs, on which FRS 102 is largely based and which includes new requirements for small entities. Our study, therefore, intends to contribute to the existing literature on the adoption of IFRS for SMEs by providing firm-level evidence from the viewpoint of SMEs by investigating the factors driving the UK SMEs to adopt FRS 102 with

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[10] FRS 102 was issued to replace the old UK GAAP. Derived from the IFRS for SMEs, the FRC has made significant modifications to address company law requirements and incorporate additional accounting options. FRS102 is applicable to unlisted or listed individual business as well as unlisted groups in the UK. Essentially, it is applicable to UK entities that do not comply with the full IFRS (see https://www.iasplus.com/en-gb/standards/uk-gaap/frs102).

a hand-collected dataset from their financial statements. This could provide useful insights for standard setters, regulators, and SMEs managers on the cost and benefit of rolling out the IFRS for SMEs in the UK.

Due to the absence of a consolidated definition of SMEs (e.g., EC, 2003; 2015), we rely on various reports with different lists of SMEs issued in different periods to form our study sample.[11] 2,121 SMEs' annual reports, depending on data availability, have been collected manually from the FAME database since the issuance of the IFRS for SMEs, i.e., from 2009 to 2018 to identify the accounting standards adopted by 248 SMEs. Our study employs the discrete hazard model 'multi-period logistic regression' because it is most suitable for modelling a continuous event, such as the adoption of accounting standards, and also the adoption of FRS102 was not compulsory until 2018 (FRC FRS 102, 2018). Our main findings suggest that SMEs with higher levels of leverage prior to the adoption of FRS 102 are less prone to follow FRS 102. This signifies that SMEs with a higher level of long-term debt might have previously set up a private channel with their creditors, through which they can share more private information. With their creditors putting relatively less weight on the quality of their financial reports, the SMEs would consciously postpone their adoption of FRS 102 until it became mandatory in 2018. Further, their decision to adopt FRS 102 and the timing of this decision is significantly associated with their growth prospect, audit quality of their financial statements, and their industry classification.

The rest of this paper consists of the following sections. Section 2 summarises the research background and relevant prior studies. Section 3 presents the hypotheses development. Section 4 describes the study sample and research design. Section 5 discusses the empirical results. Section 6 provides results on further analysis and Section 7 concludes.

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[11] These reports include lists of the best SMEs over different years. The reports have been combined to handle the issue of selection bias. However, this does not preclude the study sample from being idiosyncratic. This, in turn, underscores the importance of taking care when interpreting the results.

3.2 Research Background and Literature Review

With FRS 102 broadly based on the IFRS for SMEs, the adoption of FRS 102 provides a fertile ground to examine the costs and benefits associated with the adoption of the IFRS for SMEs. This section discusses the development of FRS 102 against the backdrop of the global convergence towards the IFRS for SMEs and reviews previous studies on the factors driving countries to adopt IFRS for SMEs.

3.2.1 FRS 102 Development

The application of the IFRS for SMEs was controversial. In Europe, for example, the option of applying the IFRS for SMEs at the supra-national level has been rejected by the European Commission (EC, hereafter), which has therefore left the decision to the EU member States (Kaya and Koch, 2015).

In 2012, the Accounting Standards Boards (ASB) revised the UK and the Republic of Ireland's financial reporting standards. The revised standards were issued to provide accounts users with high-quality financial reports that are understandable and commensurate with the complexity and the size of the entity (FRED, 2012, II). In 2015, the Financial Reporting Council (FRC) officially announced the FRS 102 in the United Kingdom and Republic of Ireland. Accounting periods starting from 1st of January 2015 or afterwards are the period where entities shall start complying with the FRS 102, with early implementation permitted since or after 31 December 2012 (FRC FRS 102, 2015). FRS 102 was issued, aiming at diminishing the intricacy and costs for organisations, while presenting a coherent and concise set of guidelines and standards to allow users of financial statements to receive high-quality and comprehensible financial reporting that is suitable for the company size and its complexity as well as the information needs of users (FRC FRS 102, 2015).

FRS 102 includes new evaluation options for small entities (FRC FRS 102, 2015). For instance, the measurement and recognition of financial instruments under FRS 102 becomes

wider. FRS 102 classifies financial instruments into complex and basic financial instruments. The complex financial instruments include items such as forward foreign exchange contracts and complex term loans that are measured at fair value. The primary financial instruments include several items such as trade payables, trade receivables, and direct bank loans that are measured at an amortised cost, with some classes evaluated at fair value or cost (FRC FRS 102, 2015). Hence, there are various options for loan appraisal, which could affect the reporting of the financial position. This would imply a shift of financial reporting brought by FRS 102, which underlines the importance of examining incentives for firms to adopt this new UK GAAP.

3.2.2 The Factors driving Firms to adopt IFRS for SMEs

Prior studies have been conducted mainly at the macro- and country-level to document various factors contributing to the adoption of the IFRS for SMEs. For instance, Bohušová and Blašková (2012) conclude that countries that have rolled out the IFRS for SMEs would usually have a lower GDP per capita and would constantly seek subsidies and financial aid, such as Ghana, South Africa and Kenya. A more comprehensive study was by Kaya and Koch (2015), who examine the factors affecting 128 countries' decisions to adopt the IFRS for SMEs. They conclude that developing countries are more likely to adopt the IFRS for SMEs than the developed countries, because developing economies, when implementing the IFRS for SMEs, could improve their economic profile by facilitating contracts with international organisations, such as World Bank and IMF, to obtain funds. In South Africa, Rudzani and Manda (2016) document that the application of the IFRS for SMEs would improve firms' access to finance and compliance with tax regulations. Adetula and Owolabi (2014) show that the factors governing the application of the IFRS for SMEs in Nigeria are due to other countries having adopted these standards, while Albu and Albu (2012) find that 'normative' isomorphism in Romania is one of the most favoured scenarios compared to coercive and mimetic scenarios that could contribute to the adoption of the IFRS for SMEs.

Another strand of the literature has examined the adoption of IFRS for SMEs using interviews or questionnaires. For instance, Hussain, Chand and Rani (2012) finds that big 4 companies in Fiji have a greater ability to deal with the IFRS for SMEs as they have a higher competitive advantage than others. Kılıç and Uyar (2017) document that the need to find a separate set of financial reporting standards for Turkish SMEs is crucial, because many entities regard the full IFRS as complex and costly, whereas the adoption of the IFRS for SMEs would provide true, fair and reliable financial information with enhanced financial reporting quality and transparency. In this context, Kılıç, Uyar and Ataman (2014) assert that reliability, comprehensibility, comparability, and transparency of the financial reporting are considered as the major benefits that can be obtained from adoption of the IFRS for SMEs.

In summary, this paper contributes to the existing literature in the following ways. First, prior studies have suggested that firms or countries are more likely to adopt the IFRS for SMEs to improve financial reporting quality, in order to have better access to external funds and to raise their economic profile in the foreign markets. However, since IFRS for SMEs have not been applied in the UK and FRS 102 is based on the IFRS for SMEs (FRC FRS 102, 2015), our study intends to complement the existing literature by providing empirical evidence on the adoption of FRS 102 by SMEs in the UK, which will shed some light on the prospects of applying the IFRS for SMEs in the UK. Specifically, we look at the factors driving the UK SMEs to switch to the FRS 102.

Second, previous studies have mainly used macro- and country-level data and relied on interviews and questionnaires surveys to investigate factors driving the adoption of IFRS for SMEs. By contrast, our study provides firm-level evidence using a hand-collected dataset from financial statements of UK SMEs. Last, few studies in the accounting literature, particularly studies on the adoption of accounting standards, have used the discrete hazard model. One exception is Bassemir (2018), who uses the discrete hazard model to study the factors that drive private firms to adopt the full IFRS. The study sample shows that approximately 10% of the

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sample firms are adopting the full IFRS, while the rest are following the GAAP. This indicates that majority of the firms have not experienced the event 'adoption', and the regression results show that a constant term is included in the baseline hazard rate, which shows that the fully non-parametric method has been used to form the function of the baseline hazard (see Jenkins, 2005). However, Jenkins (2005) indicates that fully non-parametric method should be used when the event of interest 'adoption' occurred in each spell year, while the 'piece-wise constant' method of forming the baseline hazard function should be used when there are sub-intervals within which there were no events. Hence, in our study we use the 'piece-wise constant' to form the baseline hazard function. Thus, our study is among the first few studies on the IFRS for SMEs to use the discrete hazard model on a continuous event such as the adoption of FRS 102 in the UK SMEs. This contributes to the existing literature by providing a methodological alternative, not only a more sophisticated one but which is more fit for purpose.

3.3 Hypotheses Development

Agency theory and signalling theory have been widely referred to when examining the determinants of the adoption of full IFRS by private firms (Francis, et al., 2008; André, Walton and Yang, 2012; Matonti and Iuliano, 2012; Yang, 2014; Bassemir, 2018). [12] Nonetheless, Francis, et al. assert that our knowledge of firms' activities is limited as is the role played by accounting in private firms. Moreover, the implied perception of accounting theories in private companies compared to the listed ones might vary. For instance, private companies commonly rely on external financing and are vigorously involved in contracting with external parties; thus, they have incentives to enhance their financial reporting quality in order to reduce information asymmetry and associated agency costs. Voluntary application of IAS/IFRS is deemed one approach to improve the quality of their corporate reports (2008).

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[12] Private firms can be SMEs and vice versa. SMEs, however, have different features in terms of the number of employees, turnover and balance sheet total (EC, 2003; 2015).

Further, for unlisted/private entities, private information channels are employed to minimise the information asymmetry between the main contracting bodies and the related companies (Ball and Shivakumar, 2005; Burgstahler, Hail and Leuz, 2006; Hope, Thomas and Vyas, 2013; Bassemir, 2018).

Previous studies have provided mixed evidence on the incentives of private firms to enhance their financial reporting quality. For instance, Ball and Shivakumar (2005) and Katz (2006) argue that, unlike listed companies, incentives in unlisted/private enterprises in issuing high quality financial reports barely exist, so the accounting policy options for unlisted/private companies are rarely regarded as a critical issue. Kim, Tsui and Yi (2011), however, suggest that private enterprises have powerful incentives for financial disclosure as it plays a crucial role to the access of external funding. From the perspective of reducing the cost of information asymmetry, lenders gather information about the companies' credit condition through their public disclosure. Similarly, Easley and O'Hara (2004) remark that the choice of accounting standards plays an essential role in providing proper and sufficient information to the investors and this, in turn, affects the cost of capital for private companies. Bassemir (2018) argue that it is probable that when private businesses seek alternative means of accessing finance or when shifts take place in the management system and ownership, corporate incentives for reporting may change, and hence the level of agency costs and enterprises' contractual provisions will change which may apply pressure to enhance the quality of financial reporting.

As discussed above, studies on SMEs are scant and our study intends to fill this gap by examining the factors contributing to the adoption of FRS 102 by SMEs in the UK. On the assumption that SMEs behave similarly, but not identically, to private firms, we form our hypotheses by referring to previous literature on the adoption of full IFRS by private firms and SMEs, in order to identify the contributing firm characteristics.

3.3.1 Leverage

Leverage has been identified in the literature (e.g., Yang, 2014; Bassemir, 2018) as one of the determining factors which drives firms to adopt the full IFRS. However, the empirical relationship between leverage and the likelihood to adopt IFRS is debatable. This can be reconciled via understanding the varied lending behaviour of creditors. For instance, large lending institutions which rely on 'vigorous' information such as future earnings forecasts, stock prices, and equity recommendations, are more likely to lend to public companies (see Petersen, 2004; Sunder, 2006; Peek, Cijpers and Buijink, 2010). For SMEs, Zarzesk (1996) suggests that entities with high rates of debt are more prone to sharing private information with creditors. Thus, creditors would usually establish a long-term 'lending' relationship with the private entities to obtain 'soft' information, which in turn would create a certain degree of flexibility in the relationship between creditors and private entities. This mechanism also facilitates the involvement of creditors and private firms in debt contracts that are implicit and flexible. Accordingly, creditors are less reliant on the financial reports issued by these entities to the public (Boot, 2000; Peek, Cijpers and Buijink, 2010). Furthermore, private companies are less inclined to issue high-quality financial statements to the public compared to the public companies. For instance, in Common Law countries such as the UK, information asymmetry is mitigated by public companies through publishing their financial statements to the public more often than private firms, because private companies are inherently closely held and the turnover of shareholders in private companies is lower than that in their public counterparts, and thus private firms' shareholders have an active role in administrative issues, thereby reducing their reliance on financial reports to monitor the managers (Ball and Shivakumar, 2005).

In general, the amount of information presented to the investors, depending on the accounting standards adopted, could affect the cost of the company's capital (Easley and O'Hara, 2004). Thus, contrary to the arguments above, Francis, et al. (2008) argue that firms

that are heavily in need of external financing are more inclined to enhance the quality of their financial reports through the compliance with IAS. Bassemire (2018) finds that the borrowers, i.e., 'private firms', are more likely to apply the full IFRS to increase their disclosure to the public for the purpose of reducing the problems of adverse selection in the debt markets. Similarly, Yang (2014) finds that more leveraged unlisted firms are more likely to adopt the full IFRS to disclose more information to creditors while alleviating the asymmetric information problems.

Following a similar line of logic, we conjecture that the need to access external finance also plays a crucial role in motivating SMEs to adopt FRS 102. Intuitively, SMEs may also rely on private communication channels with banks, creditors and debtholders to meet their funding requirements. Because of the mixed arguments above and limited prior knowledge on SMEs, we made no direct assumption towards the empirical relationship between leverage and its role in driving SMEs towards FRS 102 adoption. Thus, we form the following hypothesis:

H1: Leverage has no relationship with FRS 102 adoption.

3.3.2 Firm Growth and Foreign Ownership

Francis, et al. (2008) argue that the presence of foreign investors promotes the growth of an enterprise, but some private firms may face the dilemma of information asymmetry because it can be costly for the foreign owners to be knowledgeable of the firm compared to the current owners and suggests that unlisted/private firms with high expected future growth options and foreign owners are more inclined to adopt the IAS/IFRS voluntarily. This is because they have greater incentives to achieve a larger net payoff via engaging with external contracting parties and the voluntary adoption of IAS is a signal of the transparency and credibility of the financial information provided to foreign owners. Thus, implementing FRS 102 can be a way to indicate the quality and transparency of financial reports to foreign owners. Following a similar vein of logic, it is expected that the likelihood of SMEs adopting FRS 102 is significantly associated

with fundamental firm characteristics such as growth opportunities and foreign ownership.[13]

Thus, we form the two hypotheses below:

H2: *SMEs with high growth option are more likely to adopt FRS 102.*

H3: *SMEs with foreign ownership are more likely to adopt FRS 102.*

3.3.3 Audit

One manifestation of high conformity with IFRS is that the company is scrutinised by big audit firms (Street and Gray, 2002). However, in the context of small and medium-sized entities, Liu and Skerratt (2018) mention that one of the major improvements in financial reporting in the UK since the early 1980s has been the exemption of particular businesses from the full reporting provisions pertinent to listed firms. For instance, small companies could be exempt from audits as a kind of flexibility and suggest that small and micro businesses serve in the best interests of their stakeholders even when they are not undergoing an audit. Chaney, Jeter and Shivakumar (2004), however, argue that some companies aim to mitigate the agency problem by hiring auditors. It has been also noted that advice and instructions from the auditors or other foreign professionals are needed when applying a new set of accounting standards for the first time (Bassemir, 2018). It is, therefore, expected that audit quality plays a significant role in the adoption of FRS 102 in the SMEs. Thus, we form the following hypothesis:

H4: *SMEs with audited financial statements are more likely to adopt FRS 102.*

3.3.4 Industry

Industrial classification also plays a crucial role in shaping the required level of voluntary disclosure (Cooke, 1992). Yang (2014) notes that industrial firms are more likely to adopt IFRS as they are subject to intense competition, so there is a varied demand from across the industrial

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[13] Some anecdotal evidence suggests that most SMEs are family-owned businesses and/or partnerships; the percentage of foreign ownership is too small. However, as most SMEs are subsidiaries, thus the focus in this study was on the foreign ownership of the controller (i.e., shareholders of the ultimate owner of the firm). The data for this variable collected manually from the FAME database.

sectors to increase both quantity and quality of their information disclosure. Certain industries, e.g., technology and engineering/manufacturing, are more capital intense and as such rely more upon external finance for their financing needs. Bassemir (2018) argues that firms belonging to a high-tech sector (e.g., manufacturing firms) are more subject to a high level of information asymmetry, and thus these firms are more likely to adopt IFRS to alleviate the information asymmetry. Thus, it is expected that industrial SMEs in the study sample are more inclined to adopt the FRS 102 to signal their financial reporting quality to boost their chance at accessing funds. Thus, we form the following hypothesis:

H5*: Industrial SMEs are more likely to adopt FRS 102.*

3.3.5 Firm Size and Age

Firm size is another factor that may affect the accounting options for private companies' reports (Francis, et al., 2008; Yang, 2014; Bassemir, 2018). Large firms gravitate towards disclosing more information to stakeholders (Jaggi and Low, 2000), and as the IFRS requires more disclosure, the application of IFRS can bring more benefits to larger corporations (Yang, 2014). To illustrate, the cost of information production is one of the factors that are labelled as disclosure costs, and this cost is fixed and assigned to volume units in large companies, so the overall cost is low (Cuijpers and Buijink, 2005). In contrast, Doidge, Karolyi and Stulz (2007) note that it is possible that large companies encounter transparency cost(s) (see Zimmerman, 1983) and are therefore less inclined to implement better mechanisms of corporate governance (such as IAS/IFRS). Hence, due to the varied arguments about the firms' size, we made no direct assumption about the empirical relationship between firm size and the likelihood of SMEs to adopt FRS 102. The firm's age could also be a factor in driving firms toward adoption. Al-Mutawaa (2010) assumes that old firms, compared with newly established entities, might improve their disclosure practices over time and thereby increase their level of disclosure. Hence, we expect that younger SMEs are less prone to comply with the FRS (102). Thus, we form the following hypothesis:

H6: Firm Size has no relationship with FRS 102 adoption.

H7: Younger SMEs are less likely to adopt FRS 102.

3.4 Study Sample and Research Design

3.4.1 Study Sample and Data Collection

SMEs, as a unique group of entities that have been scantly studied, do not seem to have a unanimously agreed definition. Despite a thorough review of both academic literature and government reports to unveil the various definition of SMEs (UNCTAD, 2000a; ABS, 2002; EC, 2003; 2015; Botosan, et al., 2006; IASB, 2009a; Pacter, 2009; Nobes, 2010; SBA, 2012 cited in Perera and Chand, 2015, p.167; Ram and Newberry, 2013; Berisha and Shiroka-Pula, 2015), this study must resort to a rather innovative sampling process due to the variety of SMEs definitions all over the world in general and in Europe in particular.[14] Thus, to identify the study sample, we follow the analogous sampling logic used by Francis, et al. (2008) to form our study sample.[15] Accordingly, we build our sample by relying upon three officially published lists of SMEs in the UK over different years (The Best SMEs, 2012; 2014; 2018). Each report comprises the best 100 SMEs, and each list is compiled on different criteria.[16] Although we have combined the three lists to mitigate potential selection bias, we recognise that there may be a window for selection bias that may affect the results of the study in terms of generalizability, but it is vital to realise that FRS 102 includes new requirements for disclosure and wider options for financial instrument evaluation, so that if the factors driving the best SMEs to adopt FRS 102 is important for the best SMEs that included in the study

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[14] In Europe for instance, the EC's report in 2003 have published criteria for defining SMEs on the number of employees, either the balance sheet total or the turnover. In 2015, the EC issued other criteria for defining SMEs which are based on the enterprise category, whether it's autonomous, a partner, or a linked enterprise.

[15] Francis, et al. (2008) used the World Business Environment Survey (WBES) published in 2002 and which is managed by the World Bank to form their study sample of SMEs.

[16] The classification includes various criteria such as productivity, workforce, number of employees, innovation, turnover, profit before tax, and the fastest growing overseas sales.

sample, then it should be also important to other SMEs. In both ways, we must consider caution when interpreting results.

The annual reports for these entities have been manually collected across 10 years (2009 – 2018) from the FAME database.[17] We believe that all the SMEs have been exposed to the possibility of adoption of the IFRS for SMEs since 2009. The year of adoption of FRS 102 for each entity has been identified manually. Interestingly, since 2009, most SMEs in our sample were following either the UK GAAP or the Financial Reporting Standards for Small Entities (FRSSE) which was withdrawn in 2016,[18] and since 2014 these SMEs have started adopting the FRS 102. Our study sample is a 10-year unbalanced panel data from 2009 to 2018.[19]

Table 3.1 below presents the sample selection process. Since the main focus in this research is on the FRS 102, firms that adopted other standards have been removed from the study sample. To illustrates, micro-entities have been excluded from the study sample as they need to follow FRS 105 under the new UK GAAP classification (FRC FRS 102, 2015). Firms that adopted FRS 101, which is based on the full IFRS with significant reduction in disclosure requirements, have been excluded. Likewise, firms adopted the full IFRS have been removed. Following previous studies, financial companies have been removed as they could have different characteristics. Firms with unavailable data and firms that are publicly quoted also have been excluded from the study sample. In addition, firms that adopted an insurance standard such as SSAP 19 which requires a departure from the 2006 Company Act have been excluded. Moreover, SMEs switching from FRS 102 to any other accounting standard during

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[17] The structure of our sample is unbalanced, i.e., the number of available financial reports varies according to the number of years available for each entity.

[18] FRSSE is based on the UK GAAP, with a significant reduction in disclosure requirements.

[19] In March 2018, the FRC issued another report for FRS 102 and affirmed that the implementation of the FRS 102 is mandatory in 2015, while in the FRC's report issued in 2015; there was no obvious and explicit text that the application of these standards is compulsory, but it has been found that these standards are 'effective', and consequently, it was found that firms differ with regard to the year in which the standards were adopted until 2018. This has also been noticed after manually reviewing the annual reports.

our sample period have been removed from the final testing sample.[20] Further, the annual reports of each company were examined, against the guidelines mentioned in the EC's report (2003), to ascertain whether the company was classified as a small- and medium-sized company over the study period. Our final sample constitutes 248 SMEs with 2,121 annual reports and more than 2000 firm-year observations.

Table 3.1: Sample Selection

Sample Selection Criteria	Number of firms
Total number of firms.	300
Firms excluded from the study analysis.	
Micro-entities.	1
Firms that adopted FRS (101).	7
Firms that adopted the full IFRS.	7
Financial Firms.	10
Firms with unavailable data.	18
Publicly quoted firms.	3
Firms adopted SSAP 19 which requires a departure from the 2006 Company Act.	2
Firms that adopted FRS 102 then converted to IFRS.	2
Firms that adopted FRS 102, then converted to FRS 105	2
Total number of firms excluded from the study sample.	*52*
Total number of firms included in the study sample	248
Total number of annual reports depends on the data (i.e., year) availability.	2,121

3.4.2 Study Model and Variables Measurement

Since the voluntary adoption of accounting standards is discrete over time (i.e., non-simultaneous adoption), survival analysis is considered as more appropriate for this study because it aims to analyse time-to-event data (Jenkins, 2005). More specifically, it is 'a collection of statistical procedures for data analysis for which the outcome variable of interest is time until an event occurs. The time variable is usually referred to as survival time, because it gives the time that an individual has survived over some follow-up period' (Kleinbaum and Klein, 2015, p. 3). In survival analysis, the discrete-time survival approaches are appropriate

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[20] There is a possibility for the repeated event in survival analysis i.e., the repeated event during the interval 'multiple spells' (Allison, 1996). The current study's data is not subject to this kind of analysis.

for longitudinal applications especially when the data is generally gathered at discrete-time periods (Xie, et al., 2003; Sharaf, Taysseer and Tsokos, 2014). Further, it considers all year observations for each firm and considers the 'time-varying baseline hazard rate' as the characteristics of companies changing over time, and this serves to mitigate biases associated with the sample selection, incompatible estimates and biased probabilities that derive from using one observation or a one-period model (Shumway, 2001; Hillegeist, et al., 2004, p. 20).

Following Singer and Willett (1993), we propose the general form of the discrete hazard model as displayed below:

$\log(Adopt_{ij})$

$$= 1/1 + e^{-\left[\begin{array}{c}(\alpha_1 T_{1ij}+\alpha_2 T_{2ij}+\cdots+\alpha_J T_{Jij})+ \\ \left(\beta_1 Leverage_{1ij}+\beta_2 Firm\ growth_{2ij}+\beta_3 Foreign\ ownership_{3ij} \\ +\beta_4 Audit_{4ij}+\beta_5 Industry_{5ij}+\beta_6 Firm\ size_{6ij}+\beta_7 Firm\ age_{7ij}\right)\end{array}\right]}$$

Where:

$\{T_{1ij}\ldots, T_{Jij}\}$: is an array of dummy variables, with values $\{t_{1ij}\ldots t_{Jij}\}$ indexing calendar time. (*J*) Illustrates the last time span watched for any subject in the sample. So, if *ij* shows the last time span when the subject *i* was watched either experienced the event or censored,[21] therefore *J* = supremum $\{ji\}$. Following Bassemir (2018), all observations after experiencing the event (adoption of FRS 102) will be excluded from the model analysis. In this case, the dependent variable is coded as 0 for all years until it is coded as 1 in the last year, i.e., the year of the adoption, and it is coded as 0 for the years that are free of event (censored) (Jenkins, 2005). $\{\alpha_1\ldots \alpha_j\}$ captures the level of hazard baseline in each time period, and the piece-wise constant approach is used (see Jenkins, 2005) as there are firms who have never experienced the event, i.e., firms that have no available reports in recent years. $(\beta_1\ldots \beta_7)$ displays the effects of firm characteristics on the function of the baseline hazard.

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[21] Observations are 'censored' if they are free of the event. See Jenkins (2005) for more details.

Following previous studies (e.g., Yang, 2014; Francis, et al., 2008; Bassemir, 2018; Liu and Skerratt, 2018), *Leverage* is calculated as the total liabilities scaled by total assets, where total liabilities are the sum between current liabilities and long-term liabilities.[22] *Firm growth* is the expected future growth for three years for total assets, or for two years, or one year, depending on the availability of the data. *Foreign ownership* is a binary variable coded 1 if the nationality of at least one of the controlling shareholders differs from the place of residence of the entity, and zero otherwise.[23] *Firm age* is the number of years since the incorporation date. *Audit* is binary variable coded 1 if the SMEs' financial statements audited by auditors, and 0 otherwise.[24] *Industry* is a binary variable coded 1 if the SMEs belong to the industrial sector based on primary UK SIC code (2007) and 0 otherwise.[25] *Firm size* is the logarithm of the total assets.

To illustrate how this analysis works, we assume that SMEs were exposed to the possibility of adopting the IFRS for SMEs from 2009 onwards, and thus a calendar time should

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[22] According to the FAME database, current liabilities are the sum of trade creditors, short-term loans and overdrafts, and total other current liabilities. The long-term liabilities are the sum of long-term debt, total other long-term liabilities, provisions for other liabilities, pension liabilities and balance sheet minorities. As a robustness check, we have re-run our analysis using total debt, which is the sum of long-term debt and short-term loans and overdrafts. Our results remain qualitatively similar.

[23] Most SMEs are controlled subsidiaries and owned by the ultimate owner. Following Francis, et al.'s (2008) work, we use the Fame database to identify the nationality of the firm owners. The data for foreign ownership was collected manually in order to identify the nationality for all controlling shareholders.

[24] Following Liu and Skerratt's study (2018), the audit variable is collected by identifying firms with audited and unaudited accounts. Thus, after manually checking the annual reports of the SMEs in the study sample, it has been found that there are many SMEs' annual reports which have no auditor report, and after checking the FAME database carefully, it has been found that we can get data on whether a firm is audited or not. Thus, the data for this variable has been collected from the FAME database.

[25] Yang (2014) used the industry variable by separating financial and manufacturing firm in the analysis. Bassemir (2018) relies on the NACE code, a European Industry classification similar in function to the Standard Industry Classification (SIC), to measure the high-tech variable as a dummy variable coded one if firms belong to high-tech sector, and zero otherwise. Following the similar vein of logic, we measure the industry using the Standard Industrial Classification of economic activities (SIC) 2007. This SIC includes the industry classification for SMEs in the UK. Therefore, firms in the study sample are classified as manufacturing firms (i.e., industrial) or not based on the UK SIC 2007, and thus we have a dummy variable named industry which is coded as 'one' if the firm is a manufacturing firm and 'zero' otherwise. The source of the document https://www.thecompanywarehouse.co.uk/assets/images/guides/setting-up-a-limited-company/SIC_codes_V2.pdf

be specified by coding the first year as 1 and the second year as 2, until the year of event, i.e., the year of the adoption of FRS 102. In parallel, we have coded the dependent variable 'year of the event' as 0 for all years before the adoption year and as 1 for the year when the entity experiences the event 'adoption of FRS 102'. All firm-years observations after the year of adoption have been deleted.

Previous studies on factors driving countries to adopt the IFRS for SMEs were based on either interviews or questionnaires, using single or multiple period logit regressions.[26] However, much research (see Allison, 1984; Beck, Katz and Tucker, 1998; Shumway, 2001; Hillegeist, et al., 2004) has criticised the traditional 'single-period' logit or probit regressions for having three main defects: (1) bias (i.e. sample selection bias) that arises from using single observation for each firm, (2) not considering the 'time-varying baseline hazard rate',[27] and (3) producing inconsistent estimates of coefficients.[28] The discrete hazard model has been put forward to overcome these defects (Beck, Katz and Tucker, 1998; Shumway, 2001; Hillegeist, et al., 2004). Shumway (2001) has highlighted three advantages to use the hazard model over the 'single-period' logit or probit models. First, firms differ among them in terms of the occurrence of the event, especially when the period of the study sample is long, where some firms may experience the event of interest either at the beginning, during or at the end of the period. Therefore, the period of each firm that might have exposure to the event of interest should be controlled, and automatically, the hazard models control for this issue. Second,

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[26] See Kaya and Koch (2015), who estimate multi-period logit regression but for time invariant variables.

[27] Observations might be temporally correlated 'temporal dependence' as a result of the rise and fall of the value of the baseline hazard rate over time, and considering all firm-years observation without a proper controlling can result in overstating the value of t-statistics (understating the value of the standard error). Thus, to control for this issue, the 'time-varying baseline hazard rate' will be included by adding calendar-time variable to the model (Hillegeist, et al., 2004).

[28] Although the discrete hazard analysis is the primary analysis in this paper, logistic analysis is also used for all types of regressions in this paper, and the results remain qualitatively similar. However, the effect of time dummies in the logistic regression was excluded due to the inability of logistic regression to address the correlation between time and the dependent variable, which in turn may lead to inefficient coefficient estimations. The results are available upon request.

hazard models can incorporate explanatory variables that are time varying.[29] Third, estimates resulting from the use of hazard model are more accurate because of their ability to handle more data (i.e., incorporating firm-years observations than the single-period models do.

3.5 Empirical Results

3.5.1 Descriptive Statistics

The sample SMEs adopted FRS 102 since 2014, with a majority of the sample firms still following the old UK GAAP. In 2015, 70 of the sample firms switched to FRS 102 and in 2016 this amount increased dramatically to 127. By 2018, all of our sample SMEs in the study sample switched to FRS 102.[30] This confirms the legitimacy of applying the discrete hazard model to incorporate all firm characteristics over time as well as to control for each entity's year at adoption (see Shumway, 2001).

Table 3.2 shows the descriptive statistics of all the variables for the period extending from 2009 to 2018. Our final sample starts from 2009 as we believe that the SMEs have been exposed to the event of adopting the new accounting standards, i.e., IFRS for SMEs, since 2009, even though our sample started applying FRS 102 from 2014 onwards. Panel A and B presents the firm characteristics.

Panel A shows that SMEs in the study sample relied on external financing with the mean leverage ratio of 60.37%, which is close to those reported in the previous studies. For instance, Liu and Skerratt (2018) show that the level of leverage for the medium-sized firms in the UK is around 70%. Yang (2014) shows that the level of leverage for the private/unlisted firm in the UK is around 89% for IFRS adopters and around 67% for non-IFRS adopters. This implies that the leverage ratio for SMEs included in the study sample is comparable with prior studies

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[29] Unlike the time-invariant variables, the time-varying variables such as firm growth, leverage etc., which could give more accurate coefficient estimation under the discrete hazard model.

[30] A total of 12 firms did not experience the event of FRS 102 adoption until the last available data, and thus are treated as non-adopters.

conducted on SMEs and private/unlisted firms. Panel A also shows that level of short-term liabilities (at 47.56%) is higher than the level of long-term liabilities (at 13.50%). This could indicate that SMEs are more reliant on short-term liabilities which could be less expensive than long-term liabilities in terms of the interest cost. Panel A further shows that the sample SMEs has an average growth rate of 17.51% and are generally young (20 years since inception) with a logarithm of the total assets 6.69.[31] Panel B shows that 25% of our sample observations have experienced the event of adoption, 9.8% have a foreign owner, 80.99% of entities have been audited, and 28.9% are industrial firms.[32]

Table 3.2 Descriptive Statistics

Panel A: Continuous variables

Variables	Mean	SD	Q1	Median	Q3	Number of obs.	Number of firms
Leverage	0.6037	0.7087	0.3358	0.5246	0.7287	2110	248
Long-term liabilities	0.1350	0.5386	0.0015	0.0185	0.1272	2093	247
Short-term liabilities	0.4756	0.4680	0.2551	0.4119	0.6074	2097	248
Firm growth	0.1751	0.4473	0.0112	0.0995	0.2341	1842	247
Firm size	6.6960	0.5515	6.4544	6.7308	7.0043	2097	248
Firm age	20.7719	18.9606	9	15	26	2113	248

Notes: Variables estimated for the whole sample period (i.e., 2009-2018). *Leverage* is the total liabilities over the total assets. Long-term liabilities are the long-term liabilities over total assets. Short-term liabilities are the short-term liabilities over total assets. *Firm growth* is the expected future growth for three years for total assets, or for two years, or one year, depending on the availability of the data. *Firm age* is measured by the number of years since the incorporation date. *Firm size* is the log of total assets.

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[31] The average age of the private firms in the Bassemire (2018) study was around 50 years and those firms have been considered as young.

[32] These ratios represent the firm-years observations until the last available year and before moving out the observations after the adoption. However, the observations after the adoption have been excluded only for the purposes of the discrete hazard analysis.

Panel B: Dichotomous variables

Variables	Number of firms	Overall number of observations	Number of observation (Var =1)	Mean	SD
FRS 102	248	2,121	530	0.2499	0.4330
Foreign Ownership	229	1995	197	0.0987	0.2984
Audit	248	2115	1713	0.8099	0.3924
Industry	248	2,121	613	0.2890	0.4534

Notes: Variables estimated for the whole sample period (i.e., 2009-2018). FRS 102 is the dependent variable coded 1 in the year of adoption and 0 otherwise. Foreign Ownership is a binary variable coded 1 if the nationality of at least one of the controlling shareholders differs from the place of residence of the entity, and zero otherwise. Audit is measured as a binary variable coded 1 if the SMEs' financial statements audited by auditors and 0 otherwise. Industry is measured as a binary variable coded 1 if the SMEs belong to the industrial sector based on the primary UK SIC code (2007), and 0 otherwise.

3.5.2 Correlation Analysis

The correlation matrix of the SMEs' characteristics for the entire sample (i.e., 2009-2018) is displayed in Table 3.3. Pairwise correlation analysis is conducted to examine the strength and direction of relations, and whether correlation between the study variables is inappropriately high. The results show that *Leverage* has a negative correlation with *FRS 102* (r= 0.073), significant at 1%. Likewise, *Leverage* components show a negative association with FRS 102. Overall, this implies that SMEs with high level of leverage are less inclined to adopt FRS 102. This is inconsistent with previous studies (e.g., Francis, et al., 2008; Yang, 2014; Bassemir, 2018). However, it could support the findings of Zarzysk (1996) that SMEs that rely heavily on debt financing are less likely to reveal information to the public as they manage to share more private information with their creditors. This, however, warrants further investigation in the Analysis section. *Firm growth* shows a positive correlation with FRS 102, significant at 10%. This implies that SMEs that achieve rapid growth due to possible expansion of activities financed by debt are more likely to adopt FRS 102. Foreign ownership provides no significant evidence for the correlation results with FRS 102. *Audit* shows a positive relationship with FRS 102, significant at 1%. This implies that SMEs with audited financial statements are more likely

to adopt FRS 102. This confirms that firms usually tend to seek advice and instructions from auditors when applying a new set of accounting standards for the first time (Bassemir, 2018). *Industry* provides a significant and positive relationship with FRS 102 at a 5% level of significance. This implies that industrial (i.e., manufacturing) SMEs are more likely to adopt FRS 102. This supports the argument of Yang (2014) that industrial firms are more likely to signal the quality of their financial reports and to increase the disclosure level as they are subject to intense competition. *Firm size* and *Firm age* show a positive correlation with FRS 102, significant at 1%. This implies that larger and older SMEs are more likely to increase the level of transparency by switching to FRS 102 to increase the level of disclosure. This supports the argument of Jaggi and Low (2000) and Odoemelam (2019) that larger and older firms are more likely to increase the level of information disclosure to the stakeholders. In general, the correlation among variables does not raise any concerns about collinearity issues. Nonetheless, multicollinearity tests results are reported in the analysis section below.

Table 3.3: Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) FRS 10	1.000									
(2) Leverage	-0.073***	1.000								
(3) Long-term liabilities	-0.033	0.751***	1.000							
(4) Short-term liabilities	-0.060***	0.652***	-0.012	1.000						
(5) Firm growth	0.043*	0.055**	0.013	0.066***	1.000					
(6) Foreign Ownership	0.033	-0.062***	-0.048**	-0.041*	0.011	1.000				
(7) Audit	0.121***	-0.046**	0.021	-0.091***	-0.307***	0.142***	1.000			
(8) Industry	0.043**	-0.100***	-0.041*	-0.109***	-0.006	0.072***	0.130***	1.000		
(9) Firm size	0.215***	-0.222***	-0.038*	-0.287***	-0.355***	0.108***	0.562***	0.141***	1.000	
(10) Firm Age	0.104***	-0.153***	-0.060***	-0.167***	-0.144***	-0.026	0.271***	0.230***	0.322***	1.000

Notes: Variables estimated for the whole sample period (i.e., 2009-2018). *FRS 102* is the dependent variable coded 1 in the year of adoption and 0 otherwise. *Leverage* is the total liabilities over the total assets. *Long-term liabilities* are the long-term liabilities over total assets. *Short-term liabilities* are the short-term liabilities over total assets. *Firm growth* is the expected future growth for three years for total assets, or for two years or one year, depending on the availability of the data. *Foreign Ownership* is a binary variable coded 1 if the nationality of at least one of the controlling shareholders differs from the place of residence of the entity, and zero otherwise. *Audit* is measured as a binary variable coded 1 if the SMEs' financial statements audited by auditors and 0 otherwise. *Industry* is measured as a binary variable coded 1 if the SMEs belong to industrial sector based on primary UK SIC code (2007), and 0 otherwise. *Firm size* is the log of total assets. *Firm age* is measured by the number of years since the incorporation date.

3.5.3 Discrete Hazard Model Results

Discrete hazard model, as a type of survival analysis, is sensitive to the starting point of an event, i.e., when the sample objects have been exposed to the event under study. Considering the event of the adoption of FRS 102, we set 2009 and 2012 separately as two possible starting points of this event. Since 2009, the sample SMEs were believed to have been exposed to the issuance of the IFRS for SMEs and to the possibility of being required to switch to a set of new accounting standards to converge to the IFRS for SMEs. The testing period for Model (1) has been set to 2009-2018. FRS 102 is broadly based on the IFRS for SMEs, and the initial project of FRS 102 was launched in 2012 (FRED, 2012. Part II); thus, as a robustness check, the period for Model (2) ranges from 2012 to 2018. The results of all models are consistent, i.e., our key findings are insensitive to the different starting point of event. The mean variance of inflation (VIF) for all models was examined to assess the collinearity issue. In all models, the mean value of the VIF is less than 10, so the collinearity does not pose any genuine concerns about the empirical results (Gujarati, 2004).[33]

To give a complete picture of the likelihood FRS 102 adoption, in other words, to explore how the dependent variable 'FRS 102 adoption' changes as a function of a shift in a particular covariate while retaining all the other explanatory variables constant, i.e., to identify the magnitude of the coefficient estimates; the marginal effect has been estimated in Table 3.4 in the second column for Model (1) and estimated in the fifth column for Model (2). In this study, the marginal effect for the binary variables indicates how the anticipated likelihoods changes as the FRS 102 adoption shift from zero to one. The marginal effect for the continuous

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[33] To control for subjects' attributes that stand stable, notably in the longitudinal data. the fixed effect is the common way to apply (Halaby, 2004; Allison 2005; Allison and Christakis, 2006). Although the fixed effect can be applied to logistic regression (Chamberlain, 1980), the fixed effect 'conditional logistic regression' method for discrete time data and for non-repeated events failed to apply due to the availability of variables that change monotonically with time and due to the existence of censoring observations (Allison and Christakis, 2006).

covariates estimates the change proportion in the adoption of the FRS 102 that occurs because of one-unit change in the covariate.

The one-year lag model has been used also as a robustness check. Bassemir (2018) points out that it is uncertain whether this approach mitigates the bias resulting from the endogeneity. However, it might ensure that the companies' attributes in the years before the actual year of conversion to IFRS are the actual reason for driving firms to the decision of the full IFRS and that the results are not motivated by the change in companies' attributes that resulted from the shift from the prior standards to the full IFRS. Similarly, the covariates of the discrete hazard models will be lagged. Hence, column 3 in Table 3.4 is one-year lag for Model (1), while column 6 is one-year lag for Model (2).

The results of Model (1) show that *Leverage* has negative probability with FRS 102, significant at 5%. This implies that SMEs with a higher level of leverage are less incentivised to move towards the adoption of FRS 102. This negative association is particularly intriguing because it is inconsistent with previous studies conducted on private firms such as Francis, et al. (2008), Yang (2014) and Bassemir (2018).[34] It is, however, in line with Zarzesk (1996) who find that SMEs in France, Germany, and Japan greatly rely on debt financing and are less prone to disclose information to the public as they tend to share significantly more private information with their creditors. This is also in the line with the argument of Boot (2000) and Peek, et al. (2010) that private firms' creditors are more likely to establish a long-term lending relationship to acquire soft and private information and thus smoothing over the debt contract procedures in order to reduce their reliance on publicly available financial reports. It is imperative to further explore the negative association between leverage and the adoption of FRS 102. Further analysis in Section 6 is conducted by decomposing the measure of leverage (total liabilities)

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[34] The common feature between private firms and SMEs is that both are private and, in this study, the focus was on the private SMEs. Due to the lack of empirical studies on the standards applicable by SMEs, to some extent we compared our results with previous empirical studies conducted on private companies.

into long-term and short-term liabilities, as well as observing the annual effect of leverage on the adoption event.

The result in Table 3.4 also shows that the *Firm growth* is significant at 1% level, and it is positive. This implies that SMEs with a higher expected future growth are more likely to adopt the FRS 102 as it acts as an indicator for the high quality of their reports, and thus promotes the process of engaging in contracts with external bodies. This is consistent with the findings of Bassemir (2018) on a sample of German private firms. Further, *Audit* is positively associated with the probability of adopting FRS 102 and it is significant at 1%. This implies that audited SMEs are more likely to ensure that their financial reports are of a high quality. Therefore, having audited financial statements lessens the agency cost (Chaney, Jeter, and Shivakumar, 2004), which in turn increases the chance of SMEs to access external funds. Table 3.4 also shows that the *Industry* factor is positive, and it is significant at 10% level. This explains that industrial SMEs are more inclined to apply FRS 102 as a means to increase the financial reporting transparency by disclosing more information as the industrial sector is more susceptible to competition (Yang, 2014). Other firm characteristics, such as foreign ownership, size, and company age, are not significantly associated with firms' decision to switch to FRS 102.

Table 3.4: Discrete Hazard Models

Variables	Pred.	Model (1)	Marginal Effect for model (1) dy/dx	Model (1) One Year Lag	Model (2)	Marginal Effect for model (2) dy/dx	Model (2) One Year Lag
		2009-2018	2009-2018	2009-2018	2012-2018	2012-2018	2012-2018
Leverage	(?)	-0.1669**	-0.0080**	-0.1696**	-0.1696**	-0.0128**	-0.1883***
		(0.0720)	(0.0034)	(0.0696)	(0.0731)	(0.0058)	(0.0722)
Firm growth	(+)	1.5877***	0.0759***	0.9981**	1.6162***	0.1218***	1.0470**
		(0.5222)	(0.0240)	(0.4417)	(0.5131)	(0.0369)	(0.4397)
Foreign Ownership	(+)	0.3844	0.0184	0.4673*	0.3763	0.0284	0.4354*
		(0.3113)	(0 .0149)	(0.2821)	(0.2998)	(0.0227)	(0.2455)
Audit	(+)	2.2345***	0.1068***	1.2570**	2.2825***	0.720***	1.4016***
		(0.6118)	(0.0274)	(0.5304)	(0.6132)	(0.4322)	(0.5211)
Industry	(+)	0.5347*	0.0256*	0.4542*	0.5249*	0.0395*	0.3744
		(0.2917)	(0.0144)	(0.2700)	(0.2864)	0.0221	(0.2509)
Firm size	(+)	0.4188	0.0200	0.3102	0.3509	0.0264	0.2109
		(0.4423)	(0.0212)	(0.3577)	(0.4396)	0.0332	(0.3549)
Firm age	(-)	-0.0035	-0.0002	-0.0078	-0.0027	-0.0002	-0.0033
		(0.0089)	(0.0004)	(0.0090)	(0.0086)	(0.0007)	(0.0088)
Constant		-10.1214***	____	-7.9529***	-8.5186***	____	-4.6725**
		(2.9017)	____	(2.2450)	(2.9378)	____	(2.3045)
TIME DUMMIES		Yes	____	Yes	Yes	____	Yes
Pseudo-R2		0.5353	____	0.4883	0.4597	____	0.3841
Prob > chi2		0.000	____	0.000	0.000	____	0.000
N		958	____	840	606	____	488

Notes: This Table estimates the discrete hazard proportional odds models for the whole sample. Model (1) is the baseline model for the period from 2009 to2018. Model (2) is the baseline model for the period from 2012 to2018. Marginal effect and one-year lagged covariate models have been conducted for both Model (1) and Model (2), respectively. The results of all models are qualitatively similar. All observations after experiencing the event have been left out from the analysis. The constant term was included following piecewise constant methods to consider the constraint that there are some sub-intervals with no events. The robust standard errors are clustered by firm. The z-statistics are displayed in parentheses. *, **, *** indicate statistical significance at < .1, < .05 and < .01. The analysis has been rerun a number of different ways as robustness checks: *i)* models (1 & 2) with the effect of sectors (i.e., sectors as dummies); *ii)* frailty models, i.e., random effect models; *iii)* logistic regressions for models (1 & 2); *iv)* total debt, which is the sum between long-term debt and short-term loans and overdrafts, has been estimated as another proxy of leverage in both the logistic regression and discrete hazard models. The results of all robustness check models remained qualitatively similar. The results are available upon request.

The estimated marginal effect coefficients presented in Table 3.4 column 2 show that the positive change in the growth of total assets, audited financial statements, and industry increases the likelihood of the FRS 102 adoption by 7.59%, 10.68% and 2.56%, respectively. These results suggest that the growth option and the existence of audited entities' financial statements as well as industry classification are associated with SMEs' decision to adopt the new UK GAAP. *Leverage*, however, plays a negative role. This suggests that SMEs with high leverage are less willing to comply with FRS 102. Hence, the good corporate governance structure will drive the firm towards a better informational environment as a counter effect to the demotivating effect of leverage.

The estimated coefficients in the discrete models with lagged covariates in the Table 3.4 in column 3 indicate that the coefficients of both growth in total assets, foreign ownership, audited financial statements, and industry are statistically significant and positive. This implies that these characteristics were significant incentives, in the pre-application period, toward the adoption of the FRS 102. *Leverage*, however, is negative, suggesting that SMEs' managers, prior to the implementation period, are still more predisposed not to apply the FRS 102 in order to evade the simplified and clearer disclosure requirements under FRS 102 which might result in issuing better quality of the financial reports to the public. However, other positive factors exceeded the managers' desires. Overall, the results of Model (1) are qualitatively similar with the results of Model (2) which indicates that the study models are robust under different periods.

3.6 Robustness Check

To validate the robustness of our results, a series of analysis were performed. First, results in Table 3.4 indicate that highly leveraged SMEs are less likely to adopt FRS 102, and this is inconsistent with the previous studies conducted on private firms such as Francis, et al. (2008), Yang (2014) and Bassemir (2018). Since leverage is measured by total liabilities over total

assets, an inevitable question to raise here is whether long- or short-term liabilities, or both, contribute to this negative and puzzling relationship. We re-run our analysis using both long- and short term- liabilities to capture leverage; the results are presented in Table 3.5. The results suggest that SMEs with a higher percentage of long-term liabilities are less likely to adopt FRS 102. The effect of short-term liabilities seems insignificant, but the coefficient is negative. Despite the importance of short-term liabilities, long-term liabilities focus mainly on the timeframe for repayment and the interest to be paid, and thus, as is suggested in our results, the reluctance of firms with a high level of leverage to switch to FRS 102 can be justified with the existence of private channels with creditors, and since long-term liabilities is the main reason for the negative relationship, this indicates the availability of information asymmetry under the old UK GAAP and that the application of FRS 102, which requires more disclosures, could lead banks to reveal the true level of risk related to loans; thus, banks may tighten their lending criteria and adjusting their interest upwards. The results are also robust under the period from 2012 to 2019. To further understand the nature of our sample SMEs, the subsamples of 2015, 2016 and 2017 adopters have been separately examined in the further analysis section.[35]

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[35] Year 2014 and 2018 have been excluded as only one firm adopted FRS 102 in each year.

Table 3.5: The Discrete Hazard Model for Long and Short-term Liabilities

Variables	Model (3)	Marginal Effect for model (3) dy/dx	Model (4)	Marginal Effect for model (4) dy/dx
	2009-2018	2009-2018	2012-2018	2012-2018
Short-term liabilities	-0.3102	-0.0151	-0.3089	-0.0236
	(0.2518)	(0.0121)	(0.2548)	(0.0194)
Long-term liabilities	-0.1741**	-0.0085**	-0.1782**	-0.0137*
	(0.0687)	(0.0034)	(0.0693)	(0.0054)
Firm growth	1.4710***	0.0715***	1.5013***	0.1151***
	(0.5132)	(0.0240)	(0.5043)	(0.0369)
Foreign Ownership	0.3672	0.0178	0.3584	0.0275
	(0.3050)	(0.0148)	(0.2943)	(0.0226)
Audit	2.3593***	0.1146***	2.4116***	0.1849***
	(0.6286)	(0.0289)	(0.6331)	(0.0458)
Industry	0.4914*	0.0239*	0.4826*	0.0370*
	(0.2884)	(0.0144)	(0.2838)	(0.0223)
Firm size	0.2052	0.0100	0.1374	0.0105
	(0.4713)	(0.0229)	(0.4688)	(0.0359)
Firm age	-0.0048	-0.0002	-0.0040	-0.0003
	(0.0091)	(0.0004)	(0.0088)	(0.0007)
Constant	-8.6575***	_____	-7.0480**	_____
	(3.0565)	_____	(3.0941)	_____
TIME DUMMIES	YES	_____	YES	_____
Pseudo R2	0.5308	_____	0.4538	_____
Prob > chi2	0.000	_____	0.000	_____
N	961	_____	607	_____

Notes: The above Table estimates the discrete hazard proportional odds models for the study determinants for the whole sample after decomposing Leverage into long- and short-term liabilities. Model (3) is the baseline model for the period 2009-2018. Model (4) is the baseline model for the period 2012-2018. Marginal effect models have been conducted for both Model (3) and Model (4); respectively. The results of all models are qualitatively similar. All observations after experiencing the event have been left out from the analysis. The constant term was conducted based on piecewise constant methods to take account of the constraint that there are some sub-intervals within which there were no events. The robust standard errors clustered by firm. The z-statistics are displayed in parentheses. Stars indicate statistical significance: *p < .1, **p < .05, ***p < .01. As a robustness check, Models (3 & 4) have been estimated again by using the logistic regression. Further, the effect of sectors (i.e., sectors as dummies) in the logistic regression and the discrete hazard model have been estimated again. In addition, both long-term debt and short-term loans and overdrafts as other proxies of both long-term liabilities and short-term liabilities, respectively, have been estimated by using both discrete hazard model and logistic regressions. The results of all robustness check models remained qualitatively similar. The results are available upon request.

Second, we rerun the analysis to address methodological concerns relating to highly correlated variables. For example, leverage and industrial classification could be highly correlated as, for example, most SMEs that are more likely to adopt FRS 102 in the manufacturing sector tend to rely heavily on external financing while, at the same time, firms that are heavily leveraged

are also the most likely to be audited, or firms that adopt the FRS102 are only those that achieve rapid growth due to a possible expansion of activities financed by debt for which they need to properly be audited for regulatory purposes. This could possibly validate by introducing some interaction variables.[36] Thus, the discrete hazard model has been estimated again by introducing an interaction between *Leverage* with each of *Industry*, *Audit*, and *Firm growth.*

Table 3.6: The Discrete Hazard Model for Leverage Interactions with Industry, Audit, and Firm Growth

Variables	*Leverage × Industry*	*Leverage × Audit*	*Leverage × Firm growth*
	2009-2018	2009-2018	2009-018
Leverage	-0.1438**	-0.9933	-0.7901***
	(0.0713)	(1.5855)	(0.2927)
Leverage × Industry	-1.1554		
	(1.2013)		
Leverage × Audit		0.8317	
		(1.5764)	
Leverage × Firm growth			-1.7848***
			(0.6629)
Firm growth	1.6596***	1.5664***	2.1366***
	(0.5278)	(0.4818)	(0.4187)
Foreign ownership	0.3416	0.3957	0.3558
	(0.3161)	(0.3083)	(0.3072)
Audit	2.2364***	1.8126**	2.2861***
	(0.6128)	(0.7267)	(0.6252)
Industry	1.0059*	0.5417*	0.5034*
	(0.5275)	(0.2902)	(0.2898)
Firm size	0.4174	0.4138	0.4009
	(0.4367)	(0.4427)	(0.4523)
Firm age	-0.0036	-0.0037	-0.0049
	(0.0083)	(0.0089)	(0.0087)
Constant	-10.0833***	-9.6517***	-9.6145***
	(2.8689)	(2.9369)	(2.9597)
TIME DUMMIES	YES	YES	YES
Pseudo R2	0.5368	0.5357	0.5429
Prob > chi2	0.000	0.000	0.000
N	958	958	958

Notes: The above Table estimates the discrete hazard proportional odds models for the study determinants for the whole sample (i.e., 2009-2018) after interacting leverage with industry, audit, and firm growth. All observations after experiencing the event have been left out from the analysis. The constant term was conducted based on piecewise constant methods to take account of the constraint that there are some sub-intervals within which there were no events. The robust standard errors clustered by firm. The z-statistics are displayed in parentheses. Stars indicate statistical significance: *p < .1, **p < .05, ***p < .01.

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[36] Another way of validating is by splitting the sample into different sectors; however, the number of sectors is excessive and splitting the sample into different sectors could result in a low number of observations for each sector which could affect the efficiency of the coefficient estimation.

The results of Table 3.6 show that *Leverage* has a negative sign with the probability of adopting FRS 102, significant at 5%. This is consistent with our previous findings reported in the previous section. Further, the interaction between Leverage and industry provides no significant evidence. In addition, the interaction between *Audit* and *Leverage* provides no significant results. However, the interaction between *Leverage* and *Firm growth* shows a negative and significant evident at level of 1%. This indicates that *Leverage* is still more the dominant factor even if SMEs achieved a high level of growth. This could validate our previous suggestions that SMEs with a high level of leverage could have already established their private communication channel with the creditors. The results of other variables are qualitatively similar to those reported in Table 3.4.

Third, another proxy of leverage which is the total debt, and it is components (i.e., long-term debt and short-term debt) have been estimated again and the results remained robust.[37] Fourth, as an alternative approach to the discrete hazard model 'multi-period logistic regression', the simple-logistic regression has been applied for all types of analysis in this paper after neglecting the time effect.[38] Fifth, the study sample subjects that included in the analysis of time to event will experience the event of interest earlier or they will leave the sample firstly if, for unobserved reasons, they have comparatively high proportions of hazards. The sample is therefore biased to survivors (i.e., the selected) (Abbring and Van Den Berg, 2007).

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[37] Yang (2014) relies on the total liabilities to measure leverage for SMEs, while Bassemir (2018) relies on the financial liabilities to measure leverage for the private firms.

[38] The results of these robustness checks are qualitatively similar to those reported in this paper and will be made available upon request.

Thus, neglecting unobserved heterogeneity, in survival analysis, leads to inaccurate coefficient estimation (Lancaster, 1990).[39] Accordingly, to control for this issue, especially for time to event data, the model of random effect 'frailty model' has been estimated (Jenkins, 2005; Wienke, 2010).[40]

3.7 Further Analysis

To contribute to a better understanding of the negative relationship between *Leverage* and FRS 102 adoption, the discrete hazard model estimated the subsamples of 2015, 2016 and 2017 adopters, separately. Table 3.7 reports the results of the discrete hazard model of the SMEs that adopted the FRS 102 in 2015, 2016 and 2017. All observations after the adoption year have been deleted for each group.[41] To illustrate, all firm-year observations for group one (i.e., adopted in 2015) after the adoption year (2015) have been deleted for the purpose of the survival analysis (see. Jenkins, 2005), which resulted in 857 firm-year observations after considering the missing values. Then, firms adopted in 2016 have been added to the first group (i.e., adopted in 2015), considering removing all observations after the adoption of FRS 102, and then the regression has been examined separately to observe the incremental effect on the results for this group, considering the missing values, which also resulted in an increase by 90 firm-year observations. Similarly, firms adopted in 2017 have been added to the second group (i.e., adopted in 2016) to observe the incremental effect, and all observations after the adoption

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[39] Occasionally, in survival analysis, the variances from proportional hazards could be justified by unspecified random heterogeneity 'frailty' (Keiding, Andersen and Klein, 1997). The definition of frailty presumes that each person or 'subject' is carried with a specific percentage or level of frailty and that each level stands persistent throughout the life of the person. However, the definition does not suggest that the person is identical with another person even if they came from the same community and had the same frailty level (Vaupel, Manton and Stallard, 1979), particularly when it is unreasonable to consider all the pertinent risk factors (Wienke, 2010).

[40] The results of the random effect models indicate that the covariates coefficient values and their p-values are qualitatively similar with other models, while leverage shows weak evidence. Most importantly, the P-values of the likelihood ratio (Prob >= chibar2) are all insignificant, implying that there is negligible unobserved heterogeneity. For reasons of space, the results are not reported but will be made available upon request.

[41] All observations after the adoption must be deleted from the discrete hazard model.

of FRS 102 have been deleted, and the regression has been examined for this group, which resulted in an increase by 11 firm-year observation after considering the missing values. All firm-year observations before the adoption year have been used in each group for sample controlling.

The results in Table 3.7 report that the leverage of all the sub-groups as negative, indicating that SMEs in the study sample by their nature were less likely to adopt (i.e., negative sign). However, those that adopted in 2015 have insignificant p-value. This confirms that those adopted in 2015 are not the main reasons for the overall negative sign. Those adopted in 2016 and 2017 with high rates of long-term debt have significant results, indicating that they were the main reason for the negative sign. This indicates that the significant changes brought about by FRS 102, such as an increase in disclosure requirements and changes in the measurement and evaluation of financial instruments (FRC FRS 102, 2015, 2016, 2017, 2018) had a clear impact on SMEs with a high level of leverage such as adopters in 2016 and 2017, and thus SMEs with a high level of long term-debt were more likely to stay with the old UK GAAP as long as possible, suggesting that there is a level of information asymmetry under the old UK GAAP and that it is higher than when under the FRS 102.

Table 3.7: The Discrete Hazard Model for the Sub-sample Group

Variables	Pred.	Adopted in 2015	Adopted in 2016	Adopted in 2017
		(2009-2015)	*(2009-2016)*	*(2009-2017)*
Leverage	(?)	-1.1267	-0.2002*	-0.1680**
		(0.6965)	(0.1143)	(0.0754)
Firm growth	(+)	1.5316***	0.8148	1.7333***
		(0.5655)	(0.5074)	(0.5509)
Foreign Ownership	(+)	0.3774	0.3325	0.4819*
		(0.3698)	(0.3089)	(0.2696)
Audit	(+)	2.5814***	1.7784***	2.1514***
		(0.7160)	(0.5123)	(0.6169)
Industry	(+)	0.0634	0.4030*	0.4629*
		(0.3078)	(0.2188)	(0.2647)
Firm size	(+)	0.1001	0.1234	0.7683*
		(0.4251)	(0.3066)	(0.4262)
Firm age	(-)	0.0080	-0.0055	0.0011
		(0.0069)	(0.0064)	(0.0076)
Constant		-9.2095***	-7.4042***	-10.7109***
		(2.9419)	(1.8956)	(2.9126)
TIME DUMMIES		YES	YES	YES
Pseudo R2		0.2513	0.5293	0.4742
Prob > chi2		0.000	0.000	0.000
N		857	947	958

Note: The above Table estimates the discrete hazard proportional odds models for the study determinants for SMEs that adopted the FRS 102 in 2015, 2016 and 2017. All firm-year observations for group one (i.e., adopted in 2015) after the adoption year (2015) have been deleted and the same for the second group (i.e. adopted in 2016) and group three (i.e. adopted in 2017), while all firm-year observations before the adoption year have been used in each group for the purposes of sample controlling. All observations after experiencing the event have been left out from the analysis. The constant was conducted based on piecewise constant methods to take account of the constraint that there are some sub-intervals within which there were no events. The robust standard errors clustered by firm. The z-statistics are displayed in parentheses. Stars indicate statistical significance: *p < .1, **p < .05, ***p < .01. As a robustness check, the above models also have been estimated after using one year lag for the covariates. Further, the logistic regression method has been applied on the above models for the whole sample period (i.e., 2009-2008) for each group. In addition, both short- and long-term liabilities have been estimated for the above models by using both discrete hazard model and logistic regression. Also, the total debt as another proxy of leverage has been estimated for the above models by using both discrete hazard model and logistic regression. The results of all robustness check models remained qualitatively similar. The results are available upon request.

3.8 Conclusion

To contribute to a better understanding of the adoption of the IFRS for SMEs, this study set out to examine the factors driving SMEs to adopt the FRS 102 in the UK. 2,121 annual reports were collected manually for 248 SMEs with over 2000 firm year-observations from the 2009-2018 period included in the study sample. Since the adoption process was not simultaneous, with the firms experiencing differential reporting benefits over the event window, a discrete hazard model has been used.

Although the FRS 102 has more extensive, clearer, simplified disclosure requirements (FRC FRS 102, 2015, 2016, 2017, 2018), our reported results show that SMEs with high leverage under the old UK GAAP are less likely to adopt the FRS 102. This negative relationship between leverage and likelihood to adopt new accounting standards is in contrary to prior studies, such as Francis, et al. (2008), Yang (2014), and Bassemir (2018). We suspect that there were undisclosed items under the old UK GAAP to lenders, and that these sample SMEs would have already established their private channels with their creditors. This would enable them, under the old UK GAAP, to provide more private and 'soft' information to their creditors in order to create a more flexible contract environment and to reduce the creditors' reliance on their financial reports. Hence, these firms would deliberately delay their adoption of FRS 102. This argument is in line with the findings of Zarzesk (1996), Boot (2000), and Peek, et al. (2010). Our results also show that the adoption of FRS 102 of the sample SMEs were associated with firms expected future growth, whether their financial statements have been audited and their industry classification. The implication of this finding is that SMEs would adopt FRS 102 to signal high-quality financial reports to the public, seeking external funds and entering global markets.

In summary, our study provides the first evidence of the adoption of FRS 102 for the standard setters who promote the UK GAAP in its new form. This is expected to bridge the gap for the standards setters in the IASB through understanding the SMEs incentives and managers' decisions towards FRS 102 and how that decision would affect the contracting environment for SMEs in the UK and Republic of Ireland. This study also can provide evidence for banks and SMEs alike. Regarding banks, this study showed that there is a possibility of a high level of information asymmetry for SMEs with a high level of leverage. Accordingly, it is possible for banks, considering the increased level of disclosures under the FRS 102, to assess the level of risks associated with granting loans and review their policies in the lending

process. As for SMEs, they need basically to review their policies on borrowing loans from banks after the adoption of FRS 102 so that they do not risk breaking debt covenants, or not being exposed to strict lending criteria from creditors such as banks. We are fully aware that this study may be subject to limitations related to the generalizability of the results, as the top SMEs in different periods have been studied in this paper but the results may be beneficial to general SMEs and, therefore, caution must be exercised when interpreting the results.

Future research could be extended to explore the economic consequences of the adoption of the FRS 102, specifically why leverage has decreased after the adoption of FRS 102.

Chapter 4 Paper Two

Does FRS 102 Matter? Evidence from UK SMEs'

Abstract

To contribute to a better understanding of the consequences of the FRS 102 *The Financial Reporting Standard applicable in the UK and Republic of Ireland* (thereafter FRS 102), this study examines the impact of FRS 102 on financial reporting quality. It also examines the impact of FRS 102 on the relationship between earnings management and leverage. Considering a unique sample of UK SMEs that voluntarily converted to FRS 102 with 2416 annual reports collected manually across 11 years, it turns out that FRS 102 contributes to increasing reporting quality among private/SMEs. Further, the results suggest that UK SMEs manage their earnings to avoid violation in debt covenants before the adoption of FRS 102, whereas we document a reduction in this relationship after the adoption of FRS 102. The results suggest that, before FRS 102 adoption, SMEs' managers seek to manipulate earnings to avoid the prospect of violating debt covenants, while the adoption of FRS 102 has alleviated the level of information asymmetry and thus facilitated more intense monitoring from creditors.

Key words: FRS 102; earnings management; leverage; debt covenants.

4.1 Introduction

The practices of earnings management among unlisted and listed firms are not essentially symmetric, due to the difference in stakeholder's types and numbers (Ball and Shivakumar, 2005; Campa, 2019), and they can differ across nations owing to diversities in financial regulation and accounting standards (Thanh, Canh and Ha, 2020). The level of earnings management in listed companies is generally lower than unlisted companies, where listed companies constantly seek to provide their stakeholders with high-quality financial reports, while in unlisted firms, the dependence of stakeholders (i.e., capital providers and banks) on financial reports is less because they have better access to firms' private information via private channels (Coppens and Peek, 2005; Ball and Shivakumar, 2005; Burgstahler, Hail and Leuz, 2006; Hope, Thomas and Vyas, 2013).

The private sector in the UK is commonly regarded as the backbone of UK economy. It stimulates growth, constitutes jobs, and opens new markets (DFID, 2011). However, there are many reasons for private firms not being able to access debt, such as the lack of collateral, the responsibility of being private, social capital, and the agency conflict between borrowers and lenders (Berger and Udell, 1998; Chua, et al., 2011; Chen, Ding and Wu, 2014; Ding, Liu and Wu (2016). External sources of financing for private sectors, such as banks, can create a kind of agency conflict between management/borrowers and bankers/lenders, which in turn increase the managers' incentives to manage earnings (Vander, Bauwhede and Willekens, 2004; Cameran, Campa and Pettinicchio, 2014). Specifically, managers seek to manipulate earnings to avoid the prospect of violating debt covenants as the violation of debt covenants indicates that the risk of insolvency of the company can be significant, which in turn affects the reputation of managers and the company's share price (DeFond and Jiambalvo, 1994; Sweeney, 1994; Holthausen, Larcker and Sloan, 1995; Lambert, 2001; Fields, Lys and Vincent, 2001; Beatty and Weber, 2003; Iatridis and Kadorinis, 2009). Creditors play a vital role notably

when debt is used to finance the capital structure so that the creditor can monitor the practices of earnings management and firms' activities, so that debt covenants can be a reason for generating a higher incentive for managers in managing earnings to reach the requirements of shareholders and creditors (Dechow, Ge and Schrand, 2010; Ghosh and Moon, 2010; DeFond, 2010; Thanh, Canh and Ha, 2020).

Accounting standards (i.e., IAS/IFRS) play an important role in mitigating agency conflict by increasing transparency, management control, and the quality of financial reporting (Schleicher, Tahoun and Walker, 2010; Hail, Tahoun and Wang, 2014; De-George, et al., 2016), which in turn reduces the ability to manage earnings (Barth, Landsman and Lang, 2008; Christensen, et al., 2015). Our research focuses on the new UK GAAP released in 2015 by the Financial Reporting Council (FRC) in the UK and Ireland. The new UK GAAP aims to suit the requirements of entities and to increase the quality of financial reporting quality. Among these revised financial reporting standards, FRS 102 (Financial Reporting Standard 102, The Financial Reporting Standard applicable in the UK and Republic of Ireland), is largely based on the IFRS for SMEs. This new UK GAAP was set with the purpose of meeting the users' needs and enhancing the comprehensibility, relevance, and the quality of financial reporting for small entities (FRC FRS 102, 2015).[42]

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[42] FRS 102 differ from other standards in several respects related to the classification of financial assets, initial measurement of basic instruments, policy choice, accruals, performance methods, option pricing models, deferred tax, impairments of non-financial assets, consolidation, business combination, discontinued operations and assets held for sale, investment in joint ventures, evaluation of specialized activities, and service concession arrangements (see PWC, 2013).

Therefore, since SMEs are the engine driver of the UK's economy and constitute more than 99% of business in the UK (Rhodes, 2019), and since FRS 102 is applied by the small entities in the UK, which is largely based on the IFRS for SMEs,[43] this therefore gives an interesting setting to assess the level of earnings management in the UK SMEs by examining the impact of FRS 102 adoption on earnings management. Further, since debt-covenant can be a reason for managers to manage earnings, this study will also examine the impact of FRS 102 on the relationship between leverage and earnings management.

This study will contribute to the literature in several ways. In general, FRS 102 has been issued recently (i.e., 2015) with new requirements for SMEs, this in turn will improve our understanding of the implications of issuing FRS 102, as a new event, from the lens of SMEs. Specifically, prior studies (e.g., Cameran, Campa and Pettinicchio, 2014; Lee, Kang and Cho, 2015; Bassemir and Novotny-Farkas, 2018) have focused on the impact of IFRS on earnings quality from the perspective of private/unlisted firms,[44] thus to improve our understanding of the characteristics and accounting choices of SMEs, this study will introduce a first-time evidence on the impact of FRS 102, which has new requirements for small entities, on earnings quality from the perspective of SMEs in the UK Similarly, the results of previous studies on the relationship between leverage and earnings management such as Ding, Liu and Wu (2016), Anagnostopoulou and Tsekrekos (2017), Lazzem and Jilani (2018) and Thanh, Canh and Ha (2020) are varied. Thus, to introduce further evidence, the relationship between leverage and

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[43] On 9 July 2009, the IFRS for SMEs has been issued (Jermakowicz and Epstein, 2010); however, the adoption of IFRS to SMEs has been questionable. In Europe, for an illustration, the choice to implement IFRS for SMEs at the supranational level was refused by the European Commission (EC, hereafter), which left the choice to EU member states (Kaya and Koch, 2015). Hence, it turned out after collecting the annual reports manually that UK's SMEs were following the old UK GAAP before switching to FRS 102.

[44] Private sectors refer to firms with private ownership (i.e., not operated by a governments) and includes intermediaries, individual entrepreneurs, financial institutions, and entities such as SMEs (Di-Bella, et al., 2013; OECD, 2016). SMEs have different criteria based on the thresholds mentioned in definitions of the European commission in 2003 and 2015 (EC, 2003; 2015). Thus, the definition of a private firm is broader than the definition of SMEs'.

earnings management will be looked at from the perspective of SMEs in the UK with hand-collected data of annual reports.[45] Third, this study will provide first-time evidence on the impact of FRS 102 on the relationship between earnings management and leverage from the standpoint of SMEs. This, in turn, will provide valuable insights for standards setters, managers, and creditors on the benefits and costs of FRS 102 adoption from the perspective of SMEs.

To form our sample of SMEs, we followed Francis et al.'s (2008) approach, by relying on three official lists promulgated by official parties.[46] Since the adoption of FRS102 was not compulsory until 2018 (FRC, 2018), the annual reports have been collected manually to investigate the year of adoption from the FAME database, and since FRS 102 is based on the IFRS for SMEs (FRC, 2015), the annual reports have been collected since 2009 until the last available year of data, totalling, 2416 annual reports.

The results shows that FRS 102 adoption contribute at increasing reporting quality. To illustrate, the level of earnings management by using the abnormal working capital accrual has been decreased. Further, as a robustness check, other proxies of earnings management such as timely loss recognition and income smoothing have been utilised. The results also hold after the adoption of FRS 102. Moreover, the results show a positive relationship between leverage and earnings management, suggesting that UK SMEs would manage their earnings to avoid violation in debt covenants before the adoption of FRS 102, whereas we document a reduction

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[45] Annual reports have been collected manually, depending on the data availability, to identify the year of adoption.

[46] On the one hand, owing to the absence of a standard definition of SMEs in Europe (i.e., EC, 2003; 2015), we have managed various lists of SMEs across varied time periods, labeled as the BEST 100 SMEs in each list according to various benchmarks, to develop our study sample. We entirely recognize the possible caveats linked with this sampling technique and its possible consequences over the generalizability of our results. On the other hand, we believe that if we notice that the consequences accompanying the application of FRS 102 are important to the Best SMEs, then it should be also important for the general SMEs. In both cases, <u>caution must be exercised when it comes to interpreting the results.</u>.

in this relationship after the adoption of FRS 102. Overall, the results suggest that before FRS 102 adoption SMEs' managers seek to manipulate earnings to avoid the prospect of violating debt covenants, while FRS 102 adoption facilitate creditors monitoring and it is likely that some level of information asymmetry has been revealed under the old UK GAAP, and thus attract more intense monitoring from creditors.

The rest of this paper comprises the following sections. Section 2 presents the literature review and hypothesis development. Section 3 describes the research design. Section 4 discusses the empirical results. Section 5 on robustness check. Section 6 concludes.

4.2 Literature Review and hypothesis development

4.2.1. Earnings management, leverage, and FRS 102.

The positive accounting theory underlined several stimuli to manage earnings such as management compensation contract, debt covenants, and political cost. The tie between opportunistic manipulation of earnings and debt contracts suggests a potential link between earnings management and debt policy (Lazzem and Jilani, 2018). Accounting theory in its content seeks to anticipate and interpret the behaviour of managers in selecting specific accounting policies, and debt covenant hypothesis is one of the theoretical interpretations provide to explain the choices made by managers (Dewi, Anggraeni and Wardhani, 2017). Debt covenant hypothesis specifies that the decisions of managers on accounting policy options is driven by the presence of debt covenants (Watts and Zimmerman, 1986). Contrary to the hypothesis of the debt-covenant violation, there are studies that are consistent with Jensen's (1986) control hypothesis. The control hypothesis shows that debt issues can reduce the opportunistic behaviour of managers, particularly when the company obtains debt; thus, the market, analysts, and investment bankers have the chance to assess the company and monitor its business (Jensen, 1986). Hence, it is unlikely for companies' managers to manage earnings

due to being subject to control and monitoring, especially companies with high leverage (Dewi, Anggraeni and Wardhani, 2017).

In this regard, the relationship between leverage and earnings management has been of interest to researchers, where the results of the previous studies, regardless of the status of the company (i.e., listed, unlisted/private, or SMEs) are varied. Some of them support the debt-covenant hypothesis, while others support the control hypothesis. These studies are addressed below.

Lazzem and Jilani (2018) provide empirical support for the debt covenant hypothesis by using a sample of French companies for the period from 2006 to 2012, where they find that there is a positive relationship between leverage and earnings management, that is, the increase in the level of leverage is considered as an incentive for managers to manage earnings to avoid violation in debt covenants. Similarly, within the US context, Gombola, Ho and Huang (2016) found a positive relationship between earnings management and leverage during the period from 1999 to 2013. Likewise, Franz, Hassab-Elnaby and Lobo (2014) find that the company's debt covenants that have technical default or firms that are near to violating their debt covenants are managing their earnings to avoid debt covenant violation. Similarly, Iatridis and Kadorinis (2009) showed that listed firms in the UK, in the year 2007, that enjoyed a high level of leverage and firms that were close to violating their debt covenant were more likely to manage their earnings. Ghosh and Moon (2010) also find based on data from Compustat in 2006 that there is a negative relationship between earnings quality and a high level of debt, and they suggest that the benefits of avoiding the possibility of debt covenant violation outweigh the high cost of borrowing particularly for firms with a high level of debt. Within the context of developing countries, Alzoubi (2018) also shows that industrial firms in Jordan during the 2006-2012 time period with a low level of debt lessen the probability of using earnings management.

Regarding earnings management before and after the debt-covenant violation, Jha (2013) find an upward earnings management by managers in the period before the violation of the debt covenant, while during the period of the violation and beyond, managers tend to manage their earnings downward. Furthermore, they have confirmed that managing earnings made around the violation of debt covenant enhance the bargaining power of managers in the renegotiation that occurs after the violation. Their results are based on data collected from Security Exchange Commission (SEC) and Compustat databases for the period from 1996 to 2007. Similarly, Anagnostopoulou and Tsekrekos (2017) find that leverage, for the non-financial companies available in the Compustat during the period from 1990 to 2009, has a positive impact on upward real earnings management. However, they have found no evidence for the relationship between leverage and upward accrual-based earnings management. Interestingly, they have found that in the event of a high level of financial leverage, the relationship between real earnings management and accrual-based earnings management changes to a complementary relationship, and accordingly suggested that firms tend to use both real earnings management and accrual-based earnings management as there will be strong external control over the company in the event of a high level of financial leverage and, therefore, firms will be able to accomplish their earnings goals. This is consistent with the results of Campa (2015) within the context of SMEs who finds that SMEs in Spain with a greater level of bankruptcy use real earnings management instead of accruals to secure their financial distress regardless of the long-term implications for real earnings management. Likewise, Bisogno and Luca (2015) find that Italian SMEs encountering financial distress manipulate their earnings to protect their external financing. These results are also in line with the results of Mafrolla and D'Amico (2017) on SMEs in Portugal, Italy, and Spain during the period from 2002 to 2012, where it has been found that borrowers, to improve their borrowing capacity, tend to manage their earnings in order to give an indication to lenders that their financial reports are of a high quality

regardless of the costs incurred. In a comparative study between listed and non-listed companies in terms of earnings management strategies in light of financial difficulties, Campa (2019) find that during the period from 2009 to 2016, both listed and unlisted non-financial French firms use real earnings management instead of discretionary accruals in the event of financial difficulties. Further, it has been found that in the event of a financial deterioration and greater exposure to debt, listed companies engage in earnings manipulation more than unlisted companies. The results of Campa (2019) confirm their support for the hypothesis of opportunistic behavior regarding earning management particularly when firms rely greatly on external debt.

In contrast, several studies support the Jensen's (1986) control hypothesis. For example, Thanh, Canh and Ha (2020) argue that the high level of a company's debt is accompanied by an increase in restrictions on debt agreement resulting from strict monitoring by creditors, which in turn reduces the opportunity for managers to manage earnings. They have found that earnings management has a negative effect in a regime with high debt and a positive effect in a regime with low debt. Their results are based on non-financial listed firms in Vietnam during the period from 2006 to 2017. For a sample collected from ExecuComp Database, from which utility and financial companies were excluded and covering the period between 1992 to 2005, Kim, Lee and Lie (2017) found that companies with a high level of financial leverage have a limited inclination to manage their earnings to bridge the shortfall/deficit in pre-managed earnings management compared to dividends. In the same line, Zamri, Rahman and Isa (2013) have found a negative association between real earnings management and leverage for listed firms in Malaysia over the 2006-2011 period, suggesting that leverage diminishes the activities of real earnings management. Likewise, Alsharairi and Salama (2012) found a negative relationship between leverage and earnings management for a sample of U.S firm during the period 1999-2008. In addition to their support for the Jensen's (1986) control hypothesis, they

praised the important role of creditors in monitoring corporate business, which in turn reduces

earnings management. Furthermore, the study of Jelinek (2007) conducted on public U.S

companies during the period from 1992-2002 found that the higher the level of leverage, the

lower the level of earnings management. Within the context of private companies, Ding, Liu

and Wu (2016) studied private companies in Mainland China during the period from 1999 to

2006 and found that companies with high accounting information quality have a lower interest

rate and have better access to loans. Similarly, García-Teruel, Martínez-Solano and Sánchez-

Ballesta (2014) have found that industrial Spanish SMEs, for the period from 1998 to 2005,

enjoy a higher accounting quality, have greater access to bank loans and also have greater

contracting situations.

In summary, whether the relationship between earnings management and leverage supported

the debt covenant hypothesis or the control hypothesis, the results of previous studies remain

inconclusive (e.g., Jelinek, 2007; Ghosh and Moon, 2010; Alsharairi and Salama, 2012; Zamri,

Rahman and Isa, 2013; Franz, Hassab-Elnaby and Lobo, 2014; Gombola, Ho and Huang, 2016;

Alzoubi, 2018; Lazzem and Jilani, 2018; Thanh, Canh and Ha, 2020). So, our role is not to re-

test it, to confirm what the dominant relationship is, but rather to test it in order to provide a

pure background for the latter hypothesis from the lens of the UK SMEs included in the study

sample. The empirical results (Section 4.3) show that leverage has a positive relationship with

earnings management.

Positive accounting theory demonstrated the presence of reasons for managing earnings, as the

primary assumption of this theory that agents are rational parties interested in promoting their

self-interest (Beattie, et al., 1994). Previous studies, on the one hand, have argued that private

firms' shares are generally in the control of shareholders who have a special relationship with

the management or are in the hands of the management of the firm and, therefore, the agency

problems in private firms are perhaps less prominent than in publicly-held firms (Fama and

Jensen, 1983; Coppens and Peek, 2005) and, thus, less earnings management (Beatty, et al., 2002). In contrast, it has been argued that the agency problems in private firms are perhaps more prominent (Ball and Shivakumar, 2005; Burgstahler, Hail and Leuz, 2006; Liu and Skerratt, 2018). For instance, the agency problem can arise in private firms between the potential shareholders and the existing shareholders, if there is planning, by the existing shareholders, to sell their claims on the firm. Moreover, private firms may choose to evade an intervention from banks, or to manage lenders' perceptions in credit-granting decisions. Further, it is also possible that private firms may want to promote the trade terms between them and their stakeholders (i.e., customers, suppliers, and employees) (Dye, 1988, Danos, Holt and Imhoff 1989; Coopens and Peek, 2005).

IFRS can alleviate management discretion by eliminating specific accounting alternatives, which in turn reduces opportunistic management practices such as earnings management and thus improves the quality of financial reports (Barth, Landsman and Lang 2008; Păşcan, 2015). Studies on the impact of IFRS on earnings management in private/unlisted firms have started to interest researchers. For instance, Lee, Kang and Cho (2015) find that unlisted firms in South Korea that adopted IFRS voluntarily have higher level of earnings quality for the period from 2009 to 2011. Similarly, Bassemir and Novotny-Farkas (2018) find, during the period from 1998 to 2010, that the voluntary adoption of the IFRS by private firms in Germany increases the quality of the financial reports in comparison to GAAP, and they came to the conclusion that accounting standards contributed to shaping the quality of the financial reporting of the private firms. In the same vein, Haapamäki (2018) show that private firms that adopted IFRS voluntarily in Ireland, Poland, and the UK have low level of earning management during 2008-2012. In the UK context, André and Kalogirou (2020) found that the adoption of IFRS voluntarily by the UK subsidiaries (i.e., unlisted firms) contribute to increasing the accounting quality of the financial reports during the period spans from 2005 to 2012, suggesting that IFRS

increases the efficiency of monitoring. Overall, it can be suggested that the voluntary IFRS adoption contributed at increasing earnings quality in the unlisted/private firms, with one exception by Cameran, Campa and Pettinicchio (2014) who suggested that the adoption of IFRS, in the Italian private firms from 2005 to 2008, which is characterized by higher quality than national standards (i.e., GAAP) does not in itself mean better quality in preparing financial reports.

Our study is contemporary with the recent standard issued for SMEs in the UK. In 2015, the Financial Reporting Council (FRC) revised the standards of the financial reporting in the United Kingdom and Republic of Ireland, and the revision process resulted in the formation of several standards, including FRS 102 The Financial Reporting Standard applicable in the UK and Republic of Ireland, and applicable in the UK and Republic of Ireland. FRS 102 is the core among the revised standards as it includes new requirements for small entities in terms of goodwill and intangible assets, group-defined benefit schemes and deferred tax. The scope of this standard contains many advantages that have contributed to reducing disclosure requirements for small-and medium-size entities. For example, companies that adopted the FRS (102) have many exemptions in respect of the following disclosures: (1) Reconciliation of the number of shares outstanding from the beginning to end of the period. (2) Cash flow statement and related notes. (3) Key management personnel compensation. (4) Transaction with other wholly-owned subsidiaries within the group (FRC FRS 102, 2015)[47], issued with the aim of increasing the quality, relevance, and comprehensibility of the financial reports in a way that corresponds to the complexity and size of the entity and, in addition, to meet the needs of information users (FRC FRS 102, 2015). This, in turn, highlights the importance of FRS 102 and its implications related to the quality of the financial statements. Firms can start adopting

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[47] FRS102 is applicable to unlisted or listed individual business, as well as unlisted groups in the UK. Essentially, it is applicable to UK entities that do not comply with the full IFRS (see https://www.iasplus.com/en-gb/standards/uk-gaap/frs102).

FRS 102 since 1 January 2015 with early adoption is allowable since 31 December 2012 or after (FRC, 2015).

Therefore, after reviewing prior studies on the relationship between earnings management and leverage. In addition to studies on the relationship between IFRS and earnings management, the question that remain open is whether the accounting standards as a proxy of accounting quality such FRS 102 could affect the relationship between earnings management and leverage from the lens of SMEs?

From the perspective of listed firms, Dewi, Anggraeni and Wardhani (2017) find a negative relationship between Real Activities Manipulation (RAM) and IFRS convergence, and also the adoption of IFRS contributes at increasing the negative relationship between leverage and RAM in China, Malaysia, Indonesia, Philippines, Hong Kong, and Sri Lanka over the period from 2003-2014. However, our understanding of this relationship from the lens of SMEs[48] is limited particularly after issuing FRS 102 which includes new requirements for SMEs (FRC FRS 102, 2015) FRS 102 issued in 2015 for the purpose of increasing the quality of the financial statements and for increasing the disclosure requirements (FRS, 2015). Thus, it is expected that the issuance of FRS 102 will limit the practices of earnings management by manager and, hence, it is expected that the control hypothesis developed by Jensen (1986) will dominate the debt-covenant hypothesis for the relationship between earnings management and leverage, especially after issuing FRS 102. Thus, the third hypothesis is:

Hypothesis: The adoption of FRS 102 moderates the relationship between leverage and earnings management.

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[48] SMEs are one of the most influential considerations that play a crucial role in many economies as they constitute the economic engine that is always seeking economic development (Wang, et al., 2020). In the UK, for instance, SMEs represent 99% of all business (Rhodes, 2019).

4.2.4 Control variables

Following prior studies, we have included several control variables that are considered as relating to earnings management. For instance, bigger firms have been suggested to have higher level of earnings quality (Lee, Kang and Cho, 2015). This is also consistent with the findings of André and Kalogirou (2020) who found a negative relationship between firm size and earnings management. It is also suggested that firms with high opportunities of growth engage more to manage their earnings (Wang and Lin, 2013). Moreover, the cost of debt is seen as a factor that affects accrual quality (Francis, et al., 2005). Ding, Liu and Wu (2016) found that private firms with better earnings quality have a lower cost of debt. Additionally, the cost of debt is used in the model for the purpose of controlling excessive performance that could influence the accruals level (McNichols, 2000; Kothari, Leone and Wasley, 2005; Cameran, Campa and Pettinicchio, 2014). Profitability and cash flow from operation are also included to control for other firms' factors which they could affect earnings management (Carey and Simnett, 2006; Iatridis and Kadorinis; Cameran, Campa and Pettinicchio, 2014). Further, DISSUE is included to capture the influence of debt issues (Cameran et al., 2014). The audit factor is also expected to influence the quality of earnings and the Big 4 audit firms are commonly linked with lower level of earnings management (Francis, 2004; Lee, Kang and Cho, 2015). This may be somewhat different in the context of SMEs, as Liu and Sherat (2018) suggest that small businesses can be excused from audit as a form of flexibility and suggest that SMEs serve the best interests of stakeholders even when they are not subject to scrutiny for the audit process. Hence, small- and medium-sized companies may have their financial statements audited and may be exempt, thus audited financial statements will be considered.

In summary, this study contributes to the existing literature in several ways. Firstly, prior studies have focused on the effect of the adoption of IFRS on earnings management in private/unlisted firms (e.g., Lee, Kang and Cho, 2015; Haapamäki, 2018; André and Kalogirou,

2020). However, our knowledge of the consequences of the FRS 102 adoption, such as earnings management, in the private/SMEs is limited. Since FRS 102 was issued in 2015, which includes new requirements for small entities and is applicable in the UK and Republic of Ireland, this warrants further analysis to ensure a better understanding of the nature of the relationship between FRS 102 and earnings management from the lens of SMEs. Secondly, prior studies have been inconclusive on whether leverage has a negative or positive relationship with earnings management practices (e.g., Jha, 2013; Anagnostopoulou and Tsekrekos, 2017; Kim, Lee and Lie, 2017; Thanh, Canh and Ha, 2020). Thus, to contribute to a better understanding, the relationship between leverage and earnings management will be re-visited under a longer and recent period from the lens of private/SMEs that have been acknowledged as being more supportive to the hypothesis of debt covenant violation (e.g., Campa, 2015; Bisogno and Luca, 2015; Mafrolla and D'Amico, 2017). Thirdly, one study done by Dewi Anggraeni and Wardhani (2017) examines the impact of IFRS on the relationship between leverage and earnings management in listed firms; however, no study to date, to the best of our knowledge, has examined the impact of FRS 102, which has new requirements for small entities, on the relationship between earnings management and leverage from the perspective of SMEs. This, in turn, will improve our understanding of characteristics of the UK's SMEs on whether the quality brought in by FRS 102 could limit the practices of earnings management and to control the violation in debt covenant. Lastly, among the first few studies, ours will use the difference in differences with two-way fixed effect model on non-simultaneous adoption of FRS 102 by firms. This contributes to the literature because the method being used is fit for the purpose of the study's aim and for the data design.

4.3 Research design

4.3.1 Measurement of EM for SMEs

This study utilizes the abnormal working capital (AWCA). This measurement has been developed by DeFond and Park (2001) as a proxy for earnings management. Although there is a suite of models developed to measure the abnormal accruals "Jones-models" (Jones, 1991; Dechow, Sloan and Sweeney, 1995; Kothari, Leone and Wasley, 2005), using these accruals-based models tends to return unreliable estimations when there is a restricted volume of observations per year/industry (Wysocki, 2004; Peek, et al., 2013; Cameran, Campa and Pettinicchio, 2014; Marra and Mazzola, 2014).[49] Further, using Jones' (1991) type models can contribute to erroneous inferences about the presence of earnings management owing to the existence of measurement errors associated with the bias that can result from parameter estimates (Kim, Chung and Firth, 2003; Cameran, Campa and Pettinicchio, 2014). Hence, following previous studies such as Maijoor and Vanstraelen (2006), Prencipe and Bar-Yosef (2011), Prencipe (2012), Cameran, Campa and Pettinicchio (2014), and Marra and Mazzola (2014), the model of DeFond and Park (2001) that relies on the abnormal working capital accrual will be used in this study. Equation (1) represents the estimation of the abnormal working capital accrual *AWCA*, based on DeFond and Park (2001), as shown below:[50]

$$AWCA_t = WC_t - (WC_{t-1} / S_{t-1}) \times S_t$$

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[49] The Jones-types requires running a cross-sectional regression for each year for all firms for each industry which is almost impossible in our study as we have to collect the annual reports manually for all SMEs in the UK to investigate the year of adoption for the population of SMEs. See Alhadab, Clacher and Keasey (2016) whose initial sample consists of IPO firms in the UK and had to run a cross-sectional regression for all non-IPO firms for each year for each industry to estimate the discretionary accruals developed by Dechow, Sloan and Sweeney (1995). Similarly, for the Real Earnings Management measures, this requires a cross sectional analysis per year and firm's sector or industry (see Dewi, Anggraeni and Wardhani, 2017). In our study sample, however, the number of observations per year/industry is limited and thus estimating models such as Jones' (1991) models could lead to an unreliable estimate. The inability to utilize the Jones-models in this study could be a limitation for this study, but meanwhile using the abnormal working capital accrual can limit the measurement errors that could arise from adopting the Jones' models (DeFond and Park, 2001).

[50] AWCA is estimated for each firm-year observation.

Where, for firm *i* in year *t*, *WC* is non-cash working capital accruals[51], $S_{t:}$ is the firm annual sales.

Regardless of the incentives of earnings management and its impact on the reported income, the absolute value of AWCA has been used to measure the extent of earnings management in the prior literature (Prencipe and Bar-Yosef, 2011; Marra, Mazzola and Prencipe, 2011; Marra and Mazzola, 2014).[52] As a robustness check, other proxies to assess earnings quality such as timely loss recognition and income smoothing are presented in the robustness check section. Further, several tests are used, including the expanded form of Hausman test and the concurrent equation, to check the endogeneity issue (see Section 4.4).[53]

4.3.2 Empirical models

Following prior studies (e.g., Huguet and Gandía, 2014; Cameran, Campa and Pettinicchio, 2014; Lee, Kang and Cho, 2015; Anagnostopoulou and Tsekrekos, 2017; Dewi, Anggraeni and Wardhani, 2017; Bassemir and Novotny-Farkas, 2018, André and Kalogirou, 2020), we test the impact of FRS 102 on earnings management. Further, the relationship between earnings management and leverage, by employing the following equations:

Equation (3) present the relationship between earnings management and FRS 102.

$$AWCA_{it} = \alpha + \beta_1 FRS\ 102_{it} + \beta_2\ Leverage_{it} + \beta_3\ Firm\ size_{it} + \beta_4 Firm\ growth_{it}$$
$$+ \beta_5 Cost\ of\ Debt_{it} + \beta_6 CFO_{it} + \beta_7 DISSUE_{it} + \alpha_i + b_t + \varepsilon_{it}$$

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[51] Working capital accruals are calculated as the difference between current assets excluding cash and short-term investments and current liabilities excluding short-term debt.

[52] Since outliers might cause potential biases, the AWCA has been trimmed at 99%.

[53] As a robustness check the model of DeFond and Park (2001) has been estimated again after controlling the industry effect. The results are presented in Appendix B.

where, for firm i in year t, *AWCA* is the abnormal working capital accrual scaled by total assets.[54] *FRS 102* is a binary variable coded one in the year of adoption and zero otherwise. *Leverage* is the total liabilities scaled by total assets.[55] *Firm size* is the logarithm of total assets. *Firm growth* is the yearly growth in sales. *Cost of debt* is the interest expenses scaled by the average bearing debt for the current and previous year. *CFO* is cash flow from operation over average total assets for the beginning and ending of the year.[56] DISSUE is the annual change in total liabilities. α_i is the firm-fixed effect and b_t is the time-fixed effect.

Equation (2) presents the relationship between earnings management and leverage.

$$AWCA_{it} = \alpha + \beta_1\,Leverage_{it}\ +\ \beta_2\,Firm\,size_{it}\ +\ \beta_3 Firm\,growth_{it}$$
$$+\ \beta_4 ROA_{it} + \beta_5 DISSUE_{it} + \beta_6\,Audit_{it} + \alpha_i\ +\ b_t + \varepsilon_{it}$$

Variable measurements have been identified previously. *ROA* is the operating profit scaled by the average total assets. *Audit* is a binary variable coded 1 for the financial statements audited, and zero otherwise.[57]

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[54] Prior studies such as Marra, Mazzola and Prencipe (2011) scaled the AWCA by the end of the year of the total assets, while other studies such as Cameran, Campa and Pettinicchio (2014) scaled it by the beginning of the year of total assets. Thus, both approaches have been used and the results remained qualitatively similar.

[55] In line with studies that examined the relationship leverage and earnings management such as Gu, Lee and Rosett (2005), Zamri, Rahman and Isa (2013), and Dewi, Anggraeni and Wardhani (2017), leverage is measured by total liabilities. However, studies such as Cameran, Campa and Pettinicchio (2014) and Lee, Kang and Cho (2015) both used the debt ratio, and therefore the debt ratio is used as another proxy of leverage, and the results remained qualitatively similar.

[56] Prior studies such as Campa (2015), Maijoor and Vanstraelen (2006), Capkun, Collins and Jeanjean (2016) scaled the cash flow from operation by the end of the year of total assets, while both Tendeloo and Vanstraelen (2005), Cameran, Campa and Pettinicchio (2014) used the beginning of the year of total assets. Both scenarios have been used, and the results did not alter meaningfully.

[57] In Equation (3) as the Leverage is the main variable of interest, (an)other proxy/proxies of leverage has been used such as total debt which represents the sum between long-term debt and short-term loans & overdrafts. The results remained qualitatively similar. Likewise, after decomposing total debt into both long-term debt and short-term loans & overdrafts, and examining them separately with *AWCA*, the results remained qualitatively similar.

To test the study hypothesis, we use the generalized Difference-in-Differences (DID) with two-way fixed effect model for several reasons. First, to capture the effect of FRS 102 on the relationship between earnings management and leverage. Second, the adoption of FRS 102 by the UK's SMEs included in the study sample is not simultaneous (i.e., not mandatory). Third, the study data is unbalanced data for a different set of firms and periods (see Wing, Simon and Bello-Gomez, 2018).[58]

Equation (4) is used to examine the impact pf FRS 102 adoption on the relationship between earnings management and leverage to test the study Hypothesis:

$$AWCA_{it} = \alpha + \beta_1 Leverage_{it} + \Sigma\beta_i Control\ variables_{it} + \beta_3\ FRS\ 102$$
$$+ \beta_4\ FRS\ 102_{it} \times Leverage_{it} + \Sigma\beta_i Control\ variables \times FRS\ 102_{it}$$
$$+ \alpha_i + b_t + \varepsilon_{it}$$

All variables were identified in the previous section.[59] In general, coefficients of variables before the interaction with FRS 102 represent the relationship with the earnings management before the adoption of the FRS 102. $\beta_{1+}\beta_4$ captures the relationship with earnings management after the FRS 102 adoption. β_3 shows the effect of FRS 102, conditional on covariate variables, when they are equal to zero. Coefficients after the interaction with FRS 102 show the difference in effect before and after the adoption of FRS 102. For example, β_4 coefficients after the

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[58] There is a difference between the usual DID which include post variable treatment, and the generalised DID with a two-way fixed effect model that is conducted in this study. The first type normally should be used when the adoption of standards is mandatory, while the latter type is normally used when the adoption of the standards is not simultaneous. Since all SMEs by the end of 2018 have complied with FRS 102, thus the treatment group in our model is all firm-years observations after the adoption of FRS 102, while the control groups are all firm-year observations before the adoption of FRS 102 (see Wing, Simon and Bello-Gomez, 2018).

[59] To simplify the interpretation of the coefficients and to alleviate the multicollinearity issue, all right-hand covariates in Equation (4) have been centered (see Williams, 2015; Afshartous and Preston, 2011) by subtracting the average value of the covariate from each data point.

interaction with FRS 102 will capture the moderating impact of FRS 102 on the relationship

between earnings management and leverage.

4.3.3 Study sample and data collection

FRS 102, issued in 2015, is applicable in the UK and the Republic of Ireland. Firms can start

adopting FRS 102 from 1 January 2015, with early adoption allowed from 31 December 2012

or thereafter (FRC, 2015). Since FRS 102 is based on IFRS for SMEs (FRC FRS 102, 2015),

which has been issued on 2009 (Jermakowicz and Epstein, 2010); therefore, the study period

will span from 2009 until the last available year of data.[60] For the purpose of manually

collecting the annual reports, of SMEs included in the study as well as company-wide data

required for our empirical analysis, we use the FAME database. Due to the absence of a unified

definition of SMEs,[61] we followed the analogous vein of Francis, et al. (2008) approach,[62]

where three lists of SMEs in the UK published in various periods (The Best SMEs, 2012; 2014;

2018) have been utilized to determine our final sample. Each list consists of the Top 100 SMEs

identified using a mix of benchmarks such as workforce, productivity, profit before tax, number

of employees, turnover, innovation and the fastest-growing overseas sales. We merged the

three lists of Top 100 SMEs to mitigate selection bias, but we nonetheless acknowledge that

the implicit selection bias generated by this specific sampling technique could have

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[60] The last available year was varied for the study sample SMEs. For instance, the last available year in the FAME database for some SME was either 2017, 2018 or 2019, which confirm that the structure of the data is an unbalanced panel dataset.

[61] In general, definition of SMEs differed across countries (see, UNCTAD, 2000a; ABS, 2002; Botosan, et al., 2006; IASB, 2009a; Pacter, 2009; Nobes, 2010; SBA, 2012 cited in Perera and Chand, 2015; Ram and Newberry, 2013; Berisha and Pula, 2015) and they are also diverse in Europe (i.e., the EC's definitions of SMEs in 2003 and 2015), and thus the process of identifying the study sample was challenging.

[62] Francis, et al. (2008) investigates reasons for the enactment of IAS for SMEs. They used the World Business Enterprise Survey (WBES) managed by the World Bank in 2002 to determine their research sample. The survey covers the period from late 1999 to early 2000. Adopting an analogous sense of sampling SMEs, we set up our sample of SMEs by relying on three various documents promulgated by reliable authorities in three different periods.

implications on our results.[63] To investigate the year of FRS 102 adoption, a total of 2416

annual reports have been collected from 2009 until the last available year for each firm. The

final data collected is an unbalanced panel. The total number of SMEs that have been included

in the study sample is 248. A total of 236 SMEs adopted FRS 102 at some point during our

sample period.[64] By 2018, all SMEs of the study sample have switched from the old UK GAAP

to FRS 102. Around 29% of SMEs in the study sample made the switch in 2015, 51% in 2016,

and 15% in 2017. Table 4.1 presents the sample selection criteria used.

Table 4.1: Sample Selection Criteria

Sample Selection Criteria	Number of firms
Total number of SMEs.	300
Firms that adopted a different standard than the FRS 102 during the study period.	(20)
SMEs with unavailable data.	(18)
Financial firms.	(10)
Public quoted firms.	(3)
Micro-entities.	(1)
Total number of SMEs adopted FRS 102 during the study period till the last available year (i.e., unbalanced panel).	248
Total annual reports collected manually for the 248 SMEs included in the study sample.	2416

Note: Some of SMEs had been following the old UK GAAP and then converted to FRS 102, and then switched either to another accounting standards or reversed back to the old UK GAAP, and then adopted the FRS 102; thus, those firms have been deleted. Further, to be in line with previous studies, financial SMEs have been excluded. Micro entities have been also excluded as they follow FRS 105 under the new UK GAAP (FRC, 2015).

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[63] It is likely that the results will not be generalizable to the population, but it is worth indicating that FRS 102 brought about many modifications (see. FRC FRS 102, 2015), and that if the modifications are observable on the best SMEs, they too can be recognized in SMEs in general. To illustrate, if the relationship between earnings management and leverage turns out to be crucial for the top SMEs covered in the study sample, it should also matter for SMEs in general. In both ways, care must be taken when interpreting the results.

[64] A total of 12 firms have no annual reports in recent years. Thus, it can't be observed whether they switched from the old UK GAAP to FRS 102.

4.4 Empirical results

4.4.1 Descriptive statistics

Table 4.2 describes the study variables included in the study for the 248 SMEs. Overall, the results in Panel A show that the mean value of *AWCA* is 11% for the UK's SMEs is included in the study sample. This is in contrast to other studies that use the measurement of absolute value of the abnormal working capital accrual, such as Prencipe (2012) who found that the average value is around 5% for the US listed firms. Also, Maijoor and Vanstraelen (2006) found that the average value of earnings management for listed firms is around 5% in France, around 6% in Germany, and around 6% in the UK. This supports the suggestion of Ball and Shivakumar (2005) that the level of earnings manipulation in unlisted entities is higher than in listed companies. This is also in line with Coppens and Peek (2005) who found that, in the private sector, the level of accounting quality is lower. The results in Panel A also show that that the average value of *leverage* is around 59%. Similarly, Ball and Shivakumar (2005) found that average of debt obtained by the UK private firms is around 63%. This is also in line with Cameran, Campa and Pettinicchio (2014) who found that the use of debt by Italian private firms is around 61%. In comparison with listed firms in the UK, Peasnell, Pope and Young (2005) found that the average value of debt is around 52%, while Guest (2009) found that the debt is around 30%, and more recently, Adegbite, et al. (2019) found that the debt used by UK listed firms is around 24%. This indicates that the level of debt held by private companies is higher than that of listed companies. Overall, the level of both earnings management and leverage is higher than that of listed firms. This indicates that as unlisted firms do not publish their financial reports to the public (Ball and Shivakumar, 2005), this could increase information asymmetry and lead to agency conflict between borrowers and lenders which, in turn, increases the managers' incentives to manage earnings (Vander, Bauwhede and Willekens, 2004; Cameran, Campa and Pettinicchio, 2014). Furthermore, the results could

imply that the increase in the level of leverage is considered as an incentive for managers to manage earnings to avoid violation in debt covenants (Lazzem and Jilani, 2018). The descriptive statistics of the control variables are largely comparable with those documented in prior studies such as Cameran, Campa and Pettinicchio (2014), Lee, Kang and Cho (2015), and Dewi-Anggraeni and Wardhani (2017).

Table 4.2: Panel A: Continuous variables

Variables	Mean	Std.dev	Q1	Median	Q3	Number of observations	Number of firms
AWCA	0.1100	0.1876	0.0242	0.0658	0.1294	1526	218
Leverage	0.5924	0.5978	0.3394	0.5260	0.7273	2373	248
Firm size	6.7273	0.5502	6.4816	6.7576	7.0344	2407	248
Firm growth	0.2368	2.2422	-0.0497	0.0545	0.1770	1566	220
Cost of debt	0.0184	0.0329	0.0034	0.0102	0.0218	1339	215
CFO	0.1537	0.1752	0.0493	0.1337	0.2416	1382	205
DISSUE	0.3112	2.1350	-0.1021	0.0590	0.3026	2327	247
ROA	0.1310	0.2385	0.0373	0.1127	0.2206	1742	226

Note: *AWCA* is the abnormal working capital accrual scaled by total assets. *Leverage* is the total liabilities scaled by total assets. *Firm size* is the logarithm of total assets. *Firm growth* is the yearly growth in sales. *Cost of debt* is the interest expenses scaled by the average bearing debt for the current and previous year. *CFO* is cash flow from operation over average total assets for the beginning and ending of the year. DISSUE is the annual change in total liabilities. *ROA* is the operating profit scaled by the average total assets.

Panel B: Binary variables

Variables	Number of Firms	Overall Number of obs.	Number of observations (Var=1)	Mean	Std.dev
Audit	245	2240	1789	0.7987	0.4011
FRS 102	248	2416	830	0.3435	0.4750

Note: *Audit* is a binary variable coded 1 for the financial statements audited, and 0 otherwise. *FRS 102* is a binary variable coded 1 in the year of adoption and 0 otherwise.

Table 4.2, Panel B, shows that around 79.8% of the study sample (i.e., firm-year observations) are audited either by big 4, professional auditors, or accountants. This provide new evidence to prior studies such Liu and Sherat (2018), who suggest that small businesses can be exempt from audit process as a form of flexibility, that SMEs can be also subject to audit requirements. After collecting the annual reports manually to investigate the year of FRS 102 adoption, it

turns out that the mean value of FRS 102 variable is around 34.3% as displayed in Table 4.2, Panel B. To contribute to a better understanding of the adoption process, the number of firms adopted in each year is investigated, as presented in Table 4.3. The results show that in 2015 around 29% of SMEs included in the study sample have fully complied with the FRS 102. In 2016, this figure was 51%, and in 2017, it was 15%. Thus, by 2018, all SMEs included in the study sample have fully complied with the FRS 102. Hence, the overall results show that adoption process is not simultaneous by firms, and this provides an interesting setting to examine the differences in *AWCA and Leverage* before and after the adoption of FRS 102 by using the generalized t-test as demonstrated in Table 4.4.

Table 4.3 The annual adoption of FRS 102

Years	Number of Companies Adopted at this year	Number of firms that have not yet adopted
2014	1	247
2015	70	177
2016	127	50
2017	37	13
2018	1	12
2019	0	12

Note: Firms started adopting FRS 102 from 2014. A total of 12 firms have no annual reports in the recent years to see if they switched from the old UK GAAP to FRS 102.

Table 4.4 Generalized t-test for Earnings management and Leverage

Variables	Before/After FRS 102 adoption	Mean (%)	Std.Err (%)	Probability
AWCA	Before	12.42%	1.17%	0.000
	After	8.78%	1.74%	0.000
Leverage	Before	61.93%	1.58%	0.000
	After	54.08%	2.81%	0.000

Notes: *AWCA* is the abnormal working capital accrual scaled by total assets. *Leverage* is the total liabilities scaled by total assets. *Leverage* is the total liabilities scaled by total assets.

The results in Table 4.4 show that there is a significant drop in the level of earnings management at a 1% significance level, before and after the adoption of FRS 102. The mean value of earnings management before the adoption of FRS 102 was 12.42%. The mean value decreased to 8.78% after the adoption of FRS 102. When comparing this result with that of

Cameran, Campa and Pettinicchio (2014) who found that the level of abnormal working capital in unlisted/private Italian firms is around 12%, it can be said that FRS 102 contributes to lowering the level of earnings management, and thus this is in line with the FRC objective of issuing FRS 102 standard which aims to increase the quality of financial reporting (FRC, 2015). However, when comparing our results with the results of Maijoor and Vanstraelen (2006) who found that the level of abnormal working capital in listed firms in the UK is around 6%, it is clear that the level of earnings management in the UK's SMEs included in the study sample is still high in comparison with the listed firms in the UK. This could signal that the reduction in the level of earnings management is not substantial. The results in Table 4.4 also show that there is a reduction in *Leverage* after the adoption of FRS 102 significant at a level of 1%. This may mean that the adoption of FRS102 is treated as a signal of enhancing the quality of financial reporting that can reveal the true level of information asymmetry associated with loans under the old UK GAAP. This, therefore, warrants further investigation via regression analysis.

4.4.2 Correlation analysis

Table 4.5 demonstrates the correlation matrix of the study variables. We utilize the pair-wise correlation analysis to find out the strength and direction of relationships, in addition, to verifying whether there is a probability of a high correlation between the study variables. Our results demonstrate that even though FRS 102 does not support any significant evidence with its relationship with AWCA, the direction of the relationship is negative. This indicates that the level of earnings management decreased after the adoption of FRS 102. The results in Table 4.5 also show that *Leverage* has a positive correlation with AWCA (r=0.285), significant at 1%. This could imply that leverage is associated with an increase in the level of earnings management, and thus firms with a higher level of leverage tend to manage their earnings to debt-covenant violation (Watts and Zimmerman, 1986). Further, the results shows that *Firm*

size has a negative correlation with AWCA (r=0.163), significant at 1%. This supports the suggestion of André and Kalogirou (2020) that larger businesses have higher level of earnings quality. *Firm growth* provides a positive correlation with AWCA (r=0.376), significant at 1%. This supports the suggestion of Wang and Lin (2013) that firms with high opportunities of growth engage more to manage their earnings. *DISSUE* shows a positive correlation with AWCA (r=0.116), significant at 1%. This suggest that the positive change in total liabilities is associated with an increase in the level of earnings management. *ROA* provides a negative relationship (r=0.165), significant at 1%. This could imply that SMEs that tend to manage their earnings have a worse performance, which is consistent with the suggestion of Bhojraj, et al. (2009). Overall, the correlation amongst the variables do not cause concerns over collinearity issues. Nonetheless, multicollinearity tests have been examined in the regression analysis section below.

Table 4.5 Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) AWCA	1.000									
(2) FRS 102	-0.030	1.000								
(3) Leverage	0.285***	-0.085***	1.000							
(4) Firm size	-0.163***	0.249***	-0.246***	1.000						
(5) Firm growth	0.376***	-0.037	-0.003	-0.016	1.000					
(6) Cost of Debt	0.001	-0.039	0.004	0.099***	0.034	1.000				
(7) CFO	-0.023	-0.066**	-0.062**	-0.074***	0.020	-0.015	1.000			
(8) DISSUE	0.116***	-0.029	0.009	-0.014	0.266***	0.005	0.025	1.000		
(9) ROA	-0.165***	-0.007	-0.356***	0.018	0.004	0.018	0.634***	0.000	1.000	
(10) Audit	-0.029	0.131***	-0.063***	0.576***	-0.003	0.028	-0.001	-0.049**	-0.100***	1.000

Notes: *AWCA* is the abnormal working capital accrual scaled by total assets. *FRS 102* is a binary variable coded one in the year of adoption and zero otherwise. *Leverage* is the total liabilities scaled by total assets. *Firm size* is the logarithm of total assets. *Firm growth* is the yearly growth in sales. *Cost of debt* is the interest expenses scaled by the average bearing debt for the current and previous year. *CFO* is cash flow from operation over average total assets for the beginning and ending of the year. DISSUE is the annual change in total liabilities. *ROA* is the operating profit scaled by the average total assets. *Audit* is a binary variable coded 1 for the financial statements audited, and zero otherwise.

4.4.3 Regression results

Table 4.6 presents the results as detailed in Equation (2) – (4) in the research design section. The first model in Table 4.6 examines the relationship between *AWCA* and FRS 102 for the whole sample period. The second model in Table 4.6 examines the relationship between *AWCA* and *Leverage* for the whole sample period. The third model in Table 4.6 is the generalized DID with two-way fixed effect for *AWCA* and *leverage* before and after the adoption of FRS 102 are presented in two columns. The first column presents the results between *AWCA* the study variables before the adoption of FRS 102. The second column represents the results with interaction between *FRS 102* and the study covariates. The coefficient of *Leverage* in the second column (i.e., after the interaction with *FRS 102*) in the DID model for *AWCA* will be used to examine the impact of FRS 102 on the relationship between *AWCA* and *leverage*.

Models 1 and 2 in Table 4.7 are estimated with a fixed-effect estimator using the Hausman test, where the probability of the Chi2 of the Hausman test is significant at 1 %, and thus the fixed effect estimator is applied in both models to address the issue of omitted variable bias (Wooldridge, 2010). The mean Variance of Inflation (VIF) checked for models in Table 4.6 assess the collinearity issue. Across all models, the mean value of VIF is lower than 10, which implies that the collinearity does not pose any genuine concern regarding the empirical results (Gujarati, 2009).

The results in Table 4.6 for the model (1) show that *FRS 102* has a negative and significant effect on earnings management at a 10% level of significance. This indicates that the adoption of FRS 102 contributes to decrease the level of earnings management, when keeping other factors constant. This result supports the findings of previous studies that have found that the voluntary adoption of IFRS by private/unlisted firms contributes to increasing the quality of the financial reports (Lee, Kang and Cho, 2015; Bassemir and Novotny-Farkas, 2018; Haapamäki, 2018; Liu and Skerratt, 2018; André and Kalogirou, 2020).

As for the control variables in Model (1), the result shows that *firm size* has a negative and significant association with earnings management, significant at 10%. This suggests that larger SMEs have a lower level of earnings management, which is consistent with the findings of Iatridis and Kadorinis (2009) that firms with bigger size have higher level of earnings quality. *Cost of Debt* shows a positive relationship with *AWCA* at a significant level (5%). This implies that SMEs with high level of earnings management have a higher level of cost of debt. This supports the suggestion of Dine, et al. (2016) that private firms with better earnings quality have a lower cost of debt. However, the other control variables such as Leverage, Firm growth, CFO, and DISSUE show no significant evidence for the relationship with *AWCA*.

In Model (2), Leverage as a variable of interest, the results in Table 4.6 in Model (2) show that *Leverage* has a positive relationship with earnings management, significant at a level of 5% over the entire sample period. Likewise, *Leverage* has a positive relationship with earnings management, significant at a level of 10% for the DID model results, before the interaction is added. Implying an increase with leverage is associated with an increase in the level of earnings management. This implies that UK's SMEs included in the study sample that are characterized with high leverage are more likely to manage their earnings to avoid the debt-covenant violation, and this is consistent with the debt covenant hypothesis (Watts and Zimmerman, 1986).[65] This result is in line with previous studies that have suggested that the positive relationship between leverage and earnings management results from the fact that highly leveraged firms tend to manipulate their earnings in order to avoid breaching debt contracts (Iatridis and Kadorinis, 2009; Franz, Hassab-Elnaby and Lobo, 2014; Gombola, Ho and Huang, 2016; Lazzem and Jilani, 2018). However, the results of the DID model after the interaction

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[65] Debt covenant hypothesis specifies that the decisions of managers on accounting policy options are driven by the presence of debt covenants (Watts and Zimmerman, 1986). Hence, managers tend to manipulate earnings to lessen the likelihood of breaching debt covenants and their consequences (DeFond and Jiambalvo, 1994; Sweeney, 1994; Holthausen, Larcker and Sloan, 1995; Lambert, 2001; Fields, Lys and Vincent, 2001; Beatty and Weber, 2003; Iatridis and Kadorinis, 2009).

with *FRS 102* show that the adoption of FRS 102 has a negative effect on the relationship between earnings management and leverage, significant at 5%. This indicates that FRS 102 has decreased the relationship between leverage and earnings management, and this is consistent with Jensen's (1986) control hypothesis which specifies that when companies obtain debt, their business will be monitored by market, analysts, and investment bankers. This is also consistent with Dewi, Anggraeni and Wardhani (2017) who document that it is unlikely for companies' managers to manage earnings due to being subject to control and monitoring, especially companies with high leverage. Hence, FRS 102 has helped to enhance control within the firm, and thus to mitigate the opportunistic behavior of managers. Therefore, the positive relationship has weakened after the adoption of FRS 102, since the coefficient of *Leverage* before the adoption is 0.1571 and after the adoption is 0.0622 (0.1571+-0.0949). In line with the fact that private firms can connect promptly to a specific group via a private channel, the demands for private firms' financial reports from external bodies is demanded less in comparison to public companies as capital providers and banks have better access to firms' private information (Hope, Thomas and Vyas, 2013), which in turn allows private firms to establish a long-term lending link with other bodies (i.e. banks) through which outside parties can obtain information over time (Peek, Cuijpers and Buijink, 2010). Thus, it appears that the UK's SMEs included in the study sample under the old UK GAAP were able to transmit information through private channels between them and the lenders, more than after applying FRS 102 which requires more discourse requirements to increase the financial reports' transparency. Hence, it can be suggested that the application of FRS 102 has revealed the level of asymmetry in information in the financial reports prepared in accordance with the old UK GAAP. However, companies, to a lesser extent than previously, still practice earnings management in order to obtain and preserve their debts to finance their projects. This is consistent with the fact that managers seek to manipulate earnings to avoid the prospect of violating debt covenants and their implications (DeFond and Jiambalvo, 1994; Sweeney, 1994;

Holthausen, Larcker and Sloan, 1995; Lambert, 2001; Fields, Lys and Vincent, 2001; Beatty and Weber, 2003; Iatridis and Kadorinis, 2009).[66]

As for the control variables, the results in Table 4.6, Model (2) show that firm growth has a positive relationship with earnings management, significant at 1%. The same results are obtained for the DID model before the interactions are added. This is consistent with Wang and Lin (2013) who argue that firms with high opportunities of growth engage more to manage their earnings. Although the adoption of FRS 102 (i.e., after the interaction with FRS 102) has a negative effect on the relationship between earnings management and firm growth, the interaction does not provide any significant evidence. The results in Table 4.6, Model (2) also demonstrates that ROA has a negative relationship with earnings management, significant at 5%, over the whole sample period. Likewise, in Model (3) before the interaction with FRS 102, ROA provides a negative relationship with earnings management at significant level of 10%. Consistent with Bhojraj, et al. (2009), this could imply that SMEs with poor performance tend to engage in earnings management practices. However, the results of the DID model after the interaction with *FRS 102* show that the adoption of FRS 102 has a positive effect on the relationship between earnings management and *ROA*, significant at 5%. Accordingly, the negative relationship changes to a positive relationship after the adoption of FRS 102, since the coefficient of *ROA* before the adoption is -0.0761 and after the adoption is 0.0576 (-0.0761 + 0.1337). Nonetheless, we observed in Table 4.4 that earnings management by the sample SMEs has decreased. Likewise, we observed that the level of ROA decreased as well.[67] Hence, the conclusion for the negative relationship between earnings management and ROA hold for

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[66] In Equation (3 & 4) as a further analysis, leverage is decomposed into both current liabilities and long-term liabilities, but the relationship between them and *AWCA* did not provide any significant evidence. Further, in the DID model, total debt and its components have been estimated and the results do not provide any significant evidence.

[67] The generalised t-test for ROA has been conducted and the results shows that ROA before the adoption has a mean value of 14.2%, significant at 1%. After the adoption of FRS 102, the mean value of ROA is 11.2%, significant at 1%.

the positive relationship after the adoption of FRS 102. The results in Table 4.6, Model (2) also show that *DISSUE* provides no significant relationship with earnings management. However, in the DID model, the results shows that *DISSUE* has a negative relationship with earnings management before the interaction with FRS 102 (i.e., before the adoption of FRS 102), significant at 1%. This result is consistent with the findings of Cameran, Campa and Pettinicchio (2014). Even the leverage offers a positive sign to *AWCA*, but we can offer a plausible explanation. The negative sign of *DISSUE* could imply that the higher change in total liabilities (i.e., incremental increase) is associated with a low level of earnings management. However, the results after the interaction with FRS 102 show that FRS 102 has a positive relationship between earnings management and *DISSUE*, significant at 5%. This, in turn, weakened the negative relationship between earnings management and *DISSUE*, as the overall coefficient (i.e., after the adoption of FRS 102) becomes -0.0143 (-0.0653 + 0.0510), and thus the negative relationship remained. However, we observed a decline in earnings management in Table 4.4, therefore, the effect of FRS 102 should increase the negative relationship between *DISSUE* and earnings management; however, it is noticed that the level of *DISSUE* decreased as well after the adoption of FRS 102, and thus the negative relationship weakened.[68] One plausible explanation for the decrease in *DISSUE* is that higher quality information, after the adoption of FRS 102, facilitates creditors with monitoring and such a level of information asymmetry might be alleviated, and thus FRS 102 attract more intense monitoring from creditors. Hence, both leverage (i.e., total liabilities) and *DISSUE* (i.e., change in total liabilities) has decreased after the adoption of FRS 102.

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[68] The generalized t-test for DISSUE has been conducted and the results show that DISSUE before the adoption has a mean value of 20.8%, significant at 1%. After the adoption of FRS 102, the mean value of DISSUE is 15.7%, significant at 1%.

Table 4.6 Earnings management, FRS 102 and Leverage.

	Model (1)	Model (2)	Model (3)	
			Before the interaction with FRS 102	*After the interaction with FRS 102*
FRS 102	-0.0331*	——	-0.0266	
	(0.0181)		(0.0429)	
Leverage	-0.0005	0.1436**	0.1571*	-0.0949**
	(0.0180)	(0.0661)	(0.0894)	(0.0454)
Firm Size	-0.1031*	-0.0513	0.0214	-0.0249
	(0.0563)	(0.0401)	(0.0381)	(0.0199)
Firm growth	0.0323	0.0558***	0.0642***	-0.0158
	(0.0217)	(0.0120)	(0.0086)	(0.0312)
Cost of Debt	0.3516**	——	——	——
	(0.1663)			
CFO	-0.0053	——	——	——
	(0.0408)			
ROA	——	-0.1388**	-0.0761*	0.1337**
		(0.0630)	(0.0415)	(0.0673)
DISSUE	0.0026	-0.011 1	-0.0653***	0.0510**
	(0.0124)	(0.0121)	(0.0200)	(0.0246)
Audit	——	0.0733	0.0613	0.0279
		(0.0523)	(0.0568)	(0.0434)
Constant	0.8819**	0.3954	0.0325	
	(0.4114)	(0.2836)	(0.0666)	
R^2	0.3655	0.4416	0.4754	
Firms	Included	Included	Included	
Years	Included	Included	Included	
F	2.5046	2.9053	3.5989	
N	967	1469	1402	

Note: Model (1) is the two-way fixed effect model which represents the relationship between *AWCA* and *FRS 102*. Model (2) is the two-way fixed effect model which represents the relationship between *AWCA* and *Leverage*. The DID model is the generalized DID with group fixed effect and time fixed effect, which reports the results before the adoption of *FRS 102* (i.e., before the interaction with *FRS 102*), and the results of the impact of *FRS 102* on the relationship between *AWCA* and *Leverage* (i.e., after the interaction with *FRS 102*). *Covariates* in the DID model are trimmed at (1 and 99) percentile to control for the effect of outliers. The independent variables have been centered. Standard errors are displayed in parentheses. The robust standard errors are clustered by firm. Models are estimated again by clustering the standard errors by sectors, and the results remained qualitatively similar. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

4.4.4. Tests for Endogeneity

Endogeneity test for Equation (2):

The choice to apply FRS 102 and earnings management can be influenced by some unobservable variables that may have been omitted from the analysis, which in turn makes FRS 102 an endogenous variable. To check if FRS 102 is an endogenous variable in Equation (2), we followed Van-Tendeloo and Vanstraelen (2005) by applying the expanded form of Hausman test (see Maddala, 2001). Specifically, the estimated residuals from Equation (2) 'v_t' are conducted, thus utilizing a model where FRS 102 is explained by all the exogenous variables of Equation (2) (i.e., FRS 102 is the dependent variable) and, because FRS 102 is a binary variable, the logistic regression is thus applied.

$$FRS\ 102_{it} = \alpha + \beta_1\ Leverage_{it} + \beta_2\ Firm\ size_{it} + \beta_3 Firm\ growth_{it}$$
$$+ \beta_4 Cost\ of\ Debt_{it} + \beta_5 CFO_{it} + \beta_6 DISSUE_{it} + v_t$$

Thus, if the residual's coefficient of the estimated model is significantly different from zero, then the model suffers from the endogeneity bias, and thus the Two-Stage-Least-Squares (2SLS) analysis will be applied to control for this issue (Van-Tendeloo and Vanstraelen, 2005). The results of the above-estimated model shows that the significant value of the estimated residuals provides no significant evidence ($p = 0.568$), which indicates that the model does not suffers from the endogeneity issue caused by omitted variables affecting the decision to implement FRS 102 and earnings management.

Endogeneity test for Equation (3):

The relationship between earnings management and leverage might be simultaneously determined. For instance, Mafrolla and D'Amico (2017) suggests that the activity of earnings management of borrowers favors larger amounts of loans, where borrowers manage earnings to signal better quality to lenders. Hence, the reverse causality as a source of endogeneity bias

could be an issue in the H2 for the relationship between earnings management and Leverage. Thus, to verify whether earnings management affect Leverage, we estimated the following model:

$$Leverage_{it} = \alpha + \beta_1\,AWCA_{it} + \beta_2\,Firm\,size_{it} + \beta_3 Firm\,growth_{it}$$
$$+ \beta_4 ROA_{it} + \beta_5 DISSUE_{it} + \alpha_i + b_t + \varepsilon_{it}$$

All variables' measurements were identified previously. The non-reported results shows that AWCA has a positive relationship with leverage, significant at 10%. This supports the suggestion of Mafrolla and D'Amico (2017) that firms tend to manage their earnings to obtain higher level of loans. Hence, the relationship between earnings management and Leverage in Equation (3) is simultaneously determined. Thus, to alleviate this concern, we followed Gombola, Ho and Huang (2016) and Fields, et al. (2018), by using one-year lags of all covariates on the right-hand-side of the Equation (3) to ensure the exogeneity assumption between leverage and earnings management.[69] The (non-tabulated) results remained qualitatively similar for the relationship between AWCA and Leverage.

Endogeneity test for Equation (4):

Endogeneity may arise from companies self-selecting to implement the accounting standards. and this is considered as one of the issues associated with voluntary adoption studies where there exist unobserved factors that have led the companies to voluntarily switch to new accounting standards (i.e., IFRS/IAS). It is also possible to cause observable changes in the constructs under investigation, rather than the application itself (De George, Li and Shivakumar, 2016). Under the difference-in-differences method, Bertrand, et al. (2004) point out that most of the techniques used in the previous studies to address the concern of

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[69] To assure that the error terms are identically and independently distributed, and to ensure the exogeneity premise, the robust standard errors are clustered at the firm level, which also adjust for serial correlation and heteroscedasticity issues (Wooldridge, 2010).

endogeneity, particularly in the DID studies, do not actually ease this concern. Furthermore, it is problematic to detect solutions for the endogeneity issue, and even if a remedial procedure is used, it will generate other biases (Larcker and Rusticus, 2010; André, Filip and Marmousez, 2014). We fully recognize that the results of this study may be subject to the issues associated with endogeneity, and, hence, caution must be exercised when interpreting the results.

4.5 Robustness checks

Several tests will be conducted to verify the validity of our results. *First*, in order to assess earnings quality/management in the UK's SMEs included in the study sample as a result of issuing FRS 102, we employ other proxies of earnings quality. Since this study considered SMEs in the study sample, and is consistent with Cameran, Campa and Pettinicchio (2014) that such dimensions such as value relevance might not be applicable to the private firms, while both timely loss recognition and income smoothing as a proxy of earnings quality/management are applicable within the private firm context; both timely loss recognition and income smoothing will be used by following the same vein.

4.5.1 Timely loss recognition

Lang, Raedy and Yetman (2003) suggest that recognizing losses as they occur and not postponing them for extended periods of time (i.e., recognizing losses in a timely manner) is an aspect of higher earnings quality. Ball and Shivakumar (2005) pointed out that recognition of losses is one of the most important characteristics of the quality of earnings, as it increases the usefulness of the financial statement. For instance, within the context of loan agreements, recognizing losses in a timely manner helps improve the efficiency of debt contracts, as it ensures that, firstly, lenders make early decisions when the company is in distress and that, secondly, lenders intervene early in curbing managerial opportunism (Ball, Robin and Wu, 2003; Ball and Shivakumar, 2005; Chan, Hsu and Lee, 2015).

Accounting standards such as IAS/IFRS can alleviate management discretion by excluding different accounting options, which in turn reduces opportunistic activities played by management such as earnings management and therefore enhances the financial reporting quality (Barth, Landsman and Lang, 2008; Pǎşcan, 2015). Thus, previous studies focused on studying the consequences resulting from the application of accounting standards, particularly on accounting quality attributes such as timely loss recognition. For instance, a study conducted in 21 countries by Barth, Landsman and Lang (2008) found that firms complying with the International Accounting Standards (IAS) are more timely loss recognition, and thus, have higher accounting quality. Likewise, Chan, Hsu and Lee (2015) found that the adoption of IFRS increases timely loss recognition within firms in European countries. To the contrary, Ahmad, et al. (2013) have found a decrease in the timeliness of loss recognition for firms adopting IFRS in 20 countries. Similarly, in the context of private firms, Cameran, Campa and Pettinicchio (2014) have found that the losses of Italian private firms that adopted IFRS are less timely recognized. Therefore, it seems that the results of the effect of accounting standards on timely loss recognition are mixed. Thus, to build on the previous studies, timely loss recognition within the UK's SMEs will be assessed before and after the adoption of FRS 102.

To measure timely loss recognition, the model of accrual (ACC)-cash flow (CFO) developed by Ball and Shivakumar (2005) will be used as this model; it has been used previously in a study conducted on private firms such as the study by Cameran, Campa and Pettinicchio (2014) which compared the timely loss recognition under both GAAP and IFRS. The model of timely loss recognition is shown below:

$$ACC_{it} = \alpha + \beta_1 DCFO_{it} + \beta_2 CFO_{it} + \beta_3 DCFO_{it} \times CFO_{it} + \beta_i Industry_t + \beta_i Year_t + \varepsilon_{it}$$

Where:

ACC_{it}: accruals for firm i in year t and measured by the difference between earnings before extraordinary items and CFO, over beginning total assets. $DCFO_{it}$: a binary variable coded one if CFO in firm i in year t is negative, and zero otherwise. CFO_{it}: cash flow from operation for firm i in year t, over beginning total assets. $Industry_t$: industry dummies. $Year_i$: year dummies.

Following the approach of Cameran, Campa and Pettinicchio (2014) in comparing the difference in timely loss recognition before and after FRS 102 adoption, the generalized DID with two-way fixed effect model will be estimated under the old UK GAAP and under FRS 102 to assess the difference in the timely loss recognition under both standards. The focus will be on β_3 in column three which represents the difference between the two periods before and after the adoption of FRS 102 (i.e., after the adoption of FRS 102 – before the adoption of FRS 102). The positive and significant difference indicates that FRS 102 improves the timeliness of loss recognition, while the negative and significant differences indicate that FRS 102 diminishes the timeliness of loss recognition.

Table 4.7 shows that the coefficient of $DCFO_{it} \times CFO_{it}$ after FRS 102 adoption is 0.1194 and before FRS 102 adoption it is -0.321. Most importantly, the difference between FRS 102 adopters and non-adopters is 0.441 and it is significant at 5%. This indicates that the adoption of FRS 102 improves the timeliness of loss recognition. This supports our previous assumption regarding the impact of FRS 102 adoption on earnings management.

Table 4.7 FRS 102 adoption and Timely loss recognition

	(A): ACC (**Before** FRS 102 adoption)	(B): ACC (**After** FRS 102 adoption)	(A-B): (Differences)
DCFO	0.027*	0.0441**	0.017
	(0.014)	(0.0192)	(0.024)
CFO	-0.504***	-0.5534***	-0.050
	(0.022)	(0.0353)	(0.037)
DCFO×CFO	-0.321**	0.1194	0.441**
	(0.153)	(0.1697)	(0.219)
FRS 102	0.0211		
	(0.0166)		
Constant	0.002		
	(0.010)		
R^2	0.513		
Firms	Included		
Years	Included		
F	69.361***		
N	1343		

Note: The above Table was estimated by using the generalized DID model with group fixed effect and time fixed effect, which reports the results after the adoption of FRS 102 (i.e., FRS 102 adopters) and the results before the adoption of *FRS 102* (i.e., non-FRS 102 adopters). Further, the impact of *FRS 102* on the relationship between *DCFO×CFO* and *ACC* (i.e., Differences). *Variables* in the DID model *are* trimmed at (1 and 99) percentile to control for the effect of outliers. Standard errors are displayed in parentheses. The robust standard errors are clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

4.5.2 Income Smoothing

The implicit assumption on which income smoothing based is that management makes decisions that will lead to a smoother pattern in earnings and thus facilitate a rise in the perceived amount of its services. Thus, in this regard, it deceives shareholders (Lambert, 1984). Within the context of accounting standards adoption and its effect on income smoothing, the results of previous studies were varied. For instance, Gebhardt and Novotny-Farkas (2011) found that rules under IAS 39 contribute to decreasing income smoothing for banks in the European countries. Likewise, Zeghal, Chtourou and Fourati (2012) have found that the mandatory adoption of IFRS in 15 European countries is linked with a low level of income smoothing. Conversely, Capkun, Collins and Jeanjean (2016) have conducted a study on 29 countries and have found that, in countries that permit the early application of the IFRS and countries that do not permit early application, the level of earnings management (smoothing),

after the adoption of IFRS, increases. They attributed this to the fact that temporal transitions in accounting standards IAS/IFRS give companies more flexibility in discretion estimates and in choosing accounting treatments, which in turn increase earnings management. Similarly, Cameran, Campa and Pettinicchio (2014) have found an increase in income smoothing after the adoption of IFRS by the private Italian firms. Thus, to verify the level of earnings quality after the adoption of FRS 102, the effect of FRS 102 on income smoothing will be examined in the UK's SMEs included in the study sample.

To measure income smoothing, the methods of Barth, Landsman and Lang (2008) are followed, which is to rely on the residual's variance from the regression of unfixed pattern of the change in net income over total assets on specific control variables that have been used by Liu and Skerratt (2018).[70] The model is shown below:

$$\Delta NI_{it} = \alpha + \beta_1 Size_{it} + \beta_2 Growth_{it} + \beta_3 Leverage_{it} + \beta_4 DISSUE_{it} + \beta_5 Turn_{it} +$$
$$\beta_6 CFO_{it} + \beta_i Industry_t + \beta_i Year_t + \mathcal{E}_{it}$$

Where:

ΔNI_{it}: change in net income over total assets for firm *i* in year *t*. $Size_{it}$: natural logarithm of total assets for firm *i* in year *t*. $Growth_{it}$: the yearly growth in sales for firm *i* in year *t*. $Leverage_{it}$: is the total debt over the total assets for firm *i* in year *t*. $DISSUE_{it}$: change in total liabilities. $Turn_{it}$: annual sales scaled by total assets. CFO_{it}: cash flow from operation activities scaled by total assets. $Industry_t$: industry dummies. $Year_i$: year dummies.

Likewise, following the approach of Cameran, Campa and Pettinicchio (2014) in comparing income smoothing under both GAAP and IFRS for private Italian firms, the above model will be conducted separately under the old UK GAAP and FRS 102 (i.e., before and after the adoption of FRS 102). Then, the residuals for each model will be calculated as well as the

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[70] Liu and Skerratt (2018) have been also followed, as this study has been conducted on the UK's SMEs to measure income smoothing for the period from 2006 to 2013.

standard deviations for these residuals under both of the models. Subsequently, the standard deviations of the residuals under the models before and after the adoption of FRS 102 will be compared.[71] The lower values of the standard deviation of the residuals indicate an increase in income smoothing (Cameran, Campa and Pettinicchio, 2014).

Table 4.8 FRS 102 adoption and Income Smoothing

	Standard Deviation of the residuals	Levene's test (P-value)
Before FRS 102	0.2467	0.0001***
After FRS 102	0.2666	

Table 4.8 shows that the standard deviation before FRS 102 adoption is 0.2467, while after FRS 102 adoption is 0.2666 which is higher. This indicates that income smoothing after the adoption of FRS 102 has been decreased. This result is consistent with the findings of Gebhardt and Novotny-Farkas (2011) and Zeghal, Chtourou and Fourati (2012). This is also verifying that FRS 102 adoption increases earnings quality.

4.5.3 DID with lagged time variables.

Second, since our sample SMEs switched to FRS 102 at different year over the sample period, i.e., the adoption of FRS 102 is not simultaneous, the effect of FRS 102 adoption may vary with time. As a robustness check, we also run the generalized DID with two-way fixed effect model with lagged time variables (Wing, Simon and Bello-Gomez, 2018). The lagged time variables indicate any incremental effect of each additional year, where a positive coefficient of the interaction between *Lag* and *FRS 102* would suggest whether the adoption of FRS 102 has a more prominent effect over time, while a negative coefficient would suggest that the effect of FRS 102 has been diminishing over time. The results in Table 4.9 shows that the

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[71] Levene's test will be used to compare the differences in the standard deviations of the residuals under the model of the old UK GAAP and under FRS 102 as it as it does not assume that the data follows the normal distribution pattern (Gastwirth, Yulia and Miao, 2009; Cameran, Campa and Pettinicchio, 2014).

interaction between the Lag time variables with FRS 102 provide no significant evidence. This implies that the effect of FRS 102 is not varied over time. Further, the results of other covariates are qualitatively similar to those reported in Table 4.6, Model (3) meaning that the results are robust.

Table 4.9 DID with lag time variables

	DID with lag variables	
	Before the interaction with FRS 102	After the interaction with FRS 102
FRS 102		-0.0174
		(0.0473)
Leverage	0.1569*	-0.0924**
	(0.0909)	(0.0452)
Firm size	0.0209	-0.0257
	(0.0380)	(0.0199)
Firm growth	0.0642***	-0.0165
	(0.0086)	(0.0309)
ROA	-0.0771*	0.1344**
	(0.0416)	(0.0665)
DISSUE	-0.0651***	0.0493**
	(0.0200)	(0.0245)
Audit	0.0648	0.0226
	(0.0584)	(0.0466)
Lag 1 * FRS 102		0.0186
		(0.0188)
Lag 2 * FRS 102		0.0205
		(0.0190)
Lag 3 * FRS 102		-0.0129
		(0.0201)
Constant		0.0302
		(0.0672)
R^2		0.4765
Firms		Included
Years		Included
F		3.4717
N		1402

Note: The above estimation model is the generalized DID with a two-way fixed effect model with lag time variables for examining whether the effect of FRS 102 varies with time, which is a robustness check model for the DID model. *Covariates* in the DID model trimmed at (1 and 99) percentile to control for the effect of outliers. The years 2015, 2016, and 2017 have been chosen as most of SMEs in the study sample have adopted FRS 102 during these years. Where, for firm i in year t Lag1 coded one for firm i in in the first year after the adoption and all subsequent years, and zero otherwise. Lag2 is coded one for firm i in the second year after the adoption, and all subsequent years, and zero otherwise. Lag3 is coded one for firm i in the third year after the adoption, and all subsequent years, and zero otherwise. The independent variables have been centered. Standard errors are displayed in parentheses. The robust standard errors are clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

Third, although *FRS 102* is predominantly based on the IFRS for SMEs (FRC 102, 2015), which was introduced in 2009 (Jermakowicz and Epstein, 2010), the introductory project of *FRS 102* was in 2012 (FRED, 2012. Part II), and since the implementation of FRS 102 by UK SMEs covered in the study sample was not concurrent (i.e., different firms adopted FRS 102 in different years), the models in Table 4.6 have been examined again for the period from 2012-2019. The unreported results are qualitatively similar as those presented under the period 2009-2019.

4.6 Conclusion

The main objective of FRC in issuing FRS 102, which is based on the IFRS for SMEs, is to increase the quality of financial reporting (FRC, 2015). Therefore, in order to contribute to further knowledge of the implications of the endorsement of FRS 102, this study set out to investigate the influence of FRS 102 on earnings management/quality of SMEs in the UK. Further, since debt covenants can be a reason for generating a higher incentive for managers in managing earnings to reach the requirements of shareholders and creditors (Dechow, Ge and Schrand, 2010; Ghosh and Moon, 2010; DeFond, 2010; Thanh, Canh and Ha, 2020), this study also set out to examine the impact of FRS 102 on the association between earnings management/quality and leverage. The study sample includes 248 UK SMEs for the period spanning from 2009 to 2019. To investigate the adoption year, the annual reports (a total of 2416 reports) were collected and checked manually.

In general, although it is believed that private firms featured with a high level of earnings management in comparison to the listed firms (Ball and Shivakumar, 2005; Burgstahler, Hail and Leuz, 2006), the results showed that FRS 102 contributed to reducing earnings manipulation among the UK's private/SMEs. This indicates that the effects of applying FRS 102 are consistent with their objective, which is to increase the quality of financial reports (FRC FRS 102, 2015). This suggests that FRS 102 plays a substantial role in alleviating the

agency problem between borrowers and lenders by reducing the opportunistic behavior of managers. Further, the results show leverage complement earnings management activities, which suggests that SMEs' managers for SMEs are included in the study sample seek to manipulate earnings to avoid the prospect of violating debt covenants and their implications. However, FRS 102 adoption weakened the complementary relationship. Consistent with the Jensen's (1986) control hypothesis, we suggest that FRS 102 adoption facilitates monitoring by creditors and attracts more intense monitoring. Hence, it can be proposed that the FRS 102 adoption has revealed the level of information asymmetry that exists in the financial reports prepared in accordance with the old UK GAAP.

This study presents first-time evidence on the consequences of the adoption of FRS 102 based on firm-level data. Thus, it is predicted to provide valuable policy implications. For instance, FRS 102 has the aim of increasing the quality of financial reports, improving comparison, and increasing transparency. Therefore, these qualities are very important for external investors in making investment decisions. In this context, if it is realized that the benefits of moving to the new standards outweigh the costs, it is an incentive for the FRC's decisions to promote the benefits of FRS 102 adoption to SMEs. Furthermore, this study is expected to provide further evidence for creditors and shareholders on how compliance with FRS 102 affects the debt contracting environments of private/SMEs in the UK, in particular, that these standards contain substantial differences relating to financial instruments compared to other standards such IFRS and old UK GAAP (FRC FRS 102, 2015; PWC, 2013), which in turn affects the methods of valuing assets and liabilities, and consequently affects the financial position reporting.

Since this study is not free from limitations, thus future studies are encouraged to cover the limitations by studying another sample of SMEs in the UK. Further, using other measurements of earnings management/quality to confirm the validity of the results. Additionally, an examination of whether the demand for financial reports has been increased after the adoption of FRS 102 or private channels is still the dominant tool.

Chapter 5 Paper Three

Trade Credit versus Bank Credit: Evidence from SMEs' Adoption of FRS102

Abstract

In this study, we introduce the voluntary adoption of FRS 102 (UK GAAP) into the relationship between trade and bank financing by using a manually-collected sample of 2,314 firm-year observations for 248 UK SMEs (2009–2019). Our key findings suggest that the moderating effect of FRS 102 adoption can vary, depending on the intermediary role played by the SMEs, i.e., whether they are the receiver or supplier of trade credit. UK SMEs would use bank finance to substitute trade credit received from suppliers before the inception of FRS 102, whereas we document an increased reliance on the trade credit received because of restricted access to long-term bank loans after the adoption of FRS 102. Given that we observe a steady decline in the level of long-term debt, and an increase in trade credit received over the sample years. We suspect that the enhanced quality of financial information disclosure associated with the adoption of FRS 102 has facilitate bank monitoring. Suggesting that such information might be more likely to trigger debt covenants and thus attract more intense monitoring. Hence, firms might switch to trade credit after FRS 102 adoption. Conversely, when SMEs are the suppliers of trade credit, for example, to their customers, the transition to FRS 102 does not affect their decision over using trade or bank credit, which confirms our conjecture that the intermediary relationship between SMEs and their customers is less susceptible to the enhanced quality of accounting information disclosure.

Key words: trade credit; bank credit; SMEs; FRS 102; old UK GAAP.

5.1 Introduction

Trade credit is a short-term loan that a supplier grants to a buyer, and it serves as a lawfully obligated covenant that permits the buyer to purchase services and goods on account and pay the supplier at a later point (Cuñat and Garcia-Appendini, 2012; Yazdanfar and Öhman, 2017). If a firm supplies a trade credit, it will cause an increase in the account receivables; whereas if the firm receives a trade credit, this will cause an increase in the account payables instead (Jain, 2001; Oh and Kim, 2016). SMEs usually rely on a combination of bank and trade credit as they have restricted entry to the financial market (Chant and Walker 1988; Berger and Udell, 1998). Within this context, García-Teruel and Martínez-Solano (2010c) argue that the availability of monetary resources from banks plays a significant role in the company's ability to supply credit to their customers. And firms can play an intermediary role by extending bank credit to their customers (Deloof and Overfelt, 2011).

Firms usually use trade credit to either substitute for or complement the use of bank credit (Atanasova and Wilson, 2003; Yang, 2011a; 2011b). On the one hand, for firms with limited access to bank loans, trade credit is resorted to mainly as a substitute for bank borrowing (Wehinger, 2014). Also, bank borrowing could substitute trade credit when firms have easy access to banks, and thus firms reduce their dependence on credit received from their suppliers (García-Teruel and Martínez-Solano, 2010a). On the other hand, the use of trade credit enhances firms' access to bank loans, as it serves as a positive signal of a firm's creditworthiness, and hence this is regarded as a 'complementary' relationship between credit and bank financing (Biais and Gollier, 1997; Cook, 1999; García-Teruel and Martínez-Solano, 2010a). More recently, Li, Ng and Saffar (2021) document that IFRS adoption has improved financial reporting quality and has thus led to more favorable decisions from their creditors, i.e., firms that have adopted IFRS would receive more trade credit from their suppliers and then extend more credit to their customers. Conversely, Chen, et al. (2017) find that firms with lower financial reporting quality, i.e., higher information asymmetry, and lower cost of inventory

liquidation would be more likely to use trade credit because their suppliers can assess credit risk via day-to-day transactions, rather than relying on the company's financial reports. This could be considered as a comparative advantage for firms with relatively low financial reporting quality to access supplier financing.

Our research is also contemporaneous, with the ongoing debate over the adoption of IFRS for SMEs. IFRS for SMEs was issued on 9 July 2009 because of the solid global request from both developed and developing economies to introduce a simplified version of the full IFRS for SMEs (Jermakowicz and Epstein, 2010), with a measurable reduction in the disclosure requirements and measurement principles (IASB 2009; Perera and Chand, 2015). Although the International Accounting Standards Board (IASB) had hoped that the IFRS for SMEs would have a promising future, the permeation of IFRS for SMEs remains controversial as these standards are implemented at distinctively different ways across nations (Ram and Newberry, 2013). Against this backdrop, the UK, amongst other countries, has played an active role in the convergence process. The revised UK GAAP, FRS 102 (Financial Reporting Standard 102 - The Financial Reporting Standard applicable in the UK and Republic of Ireland), launched by the Financial Reporting Council (FRC) in 2015, was largely based on the IFRS for SME. This new UK GAAP, entailing requirements for small entities, was set with the purpose of meeting the users' needs and enhancing comprehensibility, relevance, and the quality of financial reporting (FRC FRS 102, 2015).

We believe that this provides an interesting setting to examine the impact of adoption of FRS 102 by the SMEs (as a proxy of enhanced financial reporting quality) over the relationship between trade credit and bank loans in the UK. Further, FRS 102 has brought significant changes to the reporting of key accounting items, such as financial instruments, which could affect the financing activities of firms (FRC FRS 102, 2015). Our study would provide useful

implications to the standard setters, creditors, and SMEs managers on the cost and benefit of FRS 102 adoption from the lens of SMEs in the UK.

Our study intends to add to the exiting literature in two ways. *First*, our study builds on the existing literature to examine the relationship between trade credit and bank credit (García-Teruel and Martínez-Solano, 2010a; 2010b; Palacín-Sánchez, Canto-Cuevas and di-Pietro, 2018; Wang, et al., 2021) with a specific focus on the SMEs. García-Teruel and Martínez-Solano (2010a) covers SMEs in the UK over the period from 1996 to 2001, while the same authors (see 2010b) cover SMEs in the European countries over the period from 1996 to 2002. Palacín-Sánchez, Canto-Cuevas and di-Pietro (2018) and Wang, et al. (2021) use a sample of European SMEs from 2008-2014 and 2006-2015, respectively. Nonetheless, an answer to whether trade credit substitute for or complement bank credit for SMEs remains inconclusive within existing studies, which warrants a further study from the lens of UK SMEs. Our paper uses a sample of UK SMEs over a longer and more recent period (2009-2019) to improve the external validity of the previous results. *Second*, this is the first study, to the best of our knowledge, to examine the moderating impact of FRS 102 adoption (as a proxy of enhanced financial reporting quality) on the relationship between trade credit and bank loans. Annual reports of the UK SMEs have been collected manually to identify the year of adoption of FRS 102.[72]

Our key findings suggest that the moderating effect of FRS 102 adoption can vary depending on the intermediary role played by the SMEs, i.e., whether they are the receiver or supplier of trade credit. UK SMEs would use bank finance to substitute trade credit received from suppliers before the inception of FRS 102, whereas we document an increased reliance on the trade credit

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[72] Owing to the lack of standard definition of SMEs in Europe (see EC, 2003; 2015), we have used different lists of SMEs across different time periods, classified as the Best 100 SMEs in each list according to different criteria, to form our study sample. We fully appreciate the potential caveats associated with this sampling method and its potential implication over the generalizability of our results.

received because of restricted access to long-term bank loans after the adoption of FRS 102. Given that we observe a steady decline in the level of long-term debt, and an increase in trade credit received over the sample years. We suspect that the enhanced quality of financial information disclosure associated with the adoption of FRS 102 has facilitate bank monitoring. Suggesting that such information might be more likely to trigger debt covenants and thus attract more intense monitoring. Hence, firms might switch to trade credit after FRS 102 adoption. Conversely, when SMEs are the suppliers of trade credit, for example, to their customers, the transition to FRS 102 does not affect their decision over using trade or bank credit, which confirms our conjecture that the intermediary relationship between SMEs and their customers is less susceptible to the enhanced quality of accounting information disclosure.

The rest of this paper comprises the following sections. Section 2 presents the literature review and hypothesis development. Section 3 describes the research design. Section 4 discusses the empirical results. Section 5 provides results on further analysis and section 6 includes robustness check. Section 7 is the conclusion.

5.2 Literature review and hypotheses development

Under the premise that trade credit and bank loans are viewed as either substitutes or complements, we first summarize prior studies on this relationship along with the theoretical underpinning. Then, we briefly introduce the background of the issuance of FRS102, which is based on the IFRS for SMEs, and the adoption of these standards by the UK SMEs. A review of prior studies on the relationship between trade credit and financial reporting quality is also provided in this section before the research hypotheses are derived.

5.2.1 Trade credit and bank financing

Trade credit received and bank credit

Theories of financing advantage and transaction cost have been used to explain why firms use trade credit (Schwartz, 1974; Ferris, 1981; Petersen and Rajan, 1997; García-Teruel and

Martínez-Solano, 2010; Al-Dohaiman, 2013). As an inclination of financial motivation, firms use trade credit received as substitute for bank financing. Emery (1984) documents the financial motive by demonstrating that firms choose to use trade credit as source of finance when the market interest rate of borrowing outweighs that of lending. Niskanen and Niskanen (2006) observe that the increase in market interest contributes to the increase in the use of trade credit by the Finnish SMEs. Similarly, Danielson and Scott (2004) find that small businesses tend to boost their request for trade credit when they face credit restrictions in obtaining bank loans. In the US, Petersen and Rajan (1997) suggest that small businesses resort to trade credit when funds are not available from financial institutions. Wang, et al. (2021) provide evidence that European SMEs use trade credit as a substitute for bank credit. In the UK, García-Teruel and Martínez-Solano (2010a) find that the availability of alternative financial sources for SMEs reduces their dependence on the financing provided by the suppliers. Specifically, large UK SMEs with a higher level of short- and long-term debt use less financing from suppliers, and the use of trade credit is negatively associated with the cost of alternative liabilities. Al Dohaiman (2013) provides similar evidence using unlisted firms in Saudi Arabia.

Conversely, trade credit could be a complement to bank financing. Biais and Gollier (1997) suggest that there are simultaneous offers between sellers, who provide trade credits, and the banks with whom they have already established relationships. Consequently, the sellers (as the credit-granting party) transfer the information of companies to the banks and this information would be incorporated into their lending decision-making process. In other words, the credit supplied depends on the private information shared between the banks (bank credit provider) and the sellers (trade credit provider). Similarly, Cook (1999) suggests that firms' use of trade credit in Russia serves as a signal to increase their likelihood of obtaining finance from the banks. Huang, Shi and Zhang (2011) confirm that this signaling effect of trade credit is of great importance, as it enables banks to assess the borrower's credibility by mitigating the extent of information asymmetry. Within the same vein, a complementary relationship has been

documented in Japan (Ono, 2001) and India (Ghosh, 2015). Yazdanfar and Öhman (2017) examine the Swedish SMEs to determine whether trade credit substitutes or complements firm's bank financing for the 2009-2012 period, and they find that trade credit is considered as an alternative (substitute) to long-term debt (i.e., negative association), while complementing the short-term debt (positive association). Mateut, Bougheas and Mizen (2006) and Yang (2011b) find that the relationship between trade and bank credit is conditioned upon monetary policy, i.e., it exhibits a substituting (complementary) relationship under tight (loose) monetary control. Palacín-Sánchez, Canto-Cuevas and di-Pietro (2018) find that trade credit and short-term debt are negatively related for SMEs in the nations that were part of the Eurozone during the 2008-2014 period, while long-term debt complements trade credit. Similarly, Lau and Schaede (2020) uses a sample of Japanese firms to document that trade credit substitutes for bank loans throughout the economic upswing, whereas complementing each other during economic stagnation.

In summary, whether trade credit substitute or complement bank credit for SMEs remains inconclusive within existing studies, which warrants a further study from the lens of UK SMEs. Our study builds on the existing literature to examine the relationship between trade credit and bank credit (García-Teruel and Martínez-Solano, 2010a; 2010b; Palacín-Sánchez, Canto-Cuevas and di-Pietro; Wang, et al., 2021) with a specific focus on UK SMEs. We form the first set of hypotheses below:

H1a (Substitution Hypothesis): Trade credit received substitutes for bank credit for UK SMEs.

H1b (Complement Hypothesis): Trade credit received complements bank credit for UK SMEs.

Trade credit supplied and bank credit

Another commonly acknowledged motivation of using trade credit is the transactional need. During the transaction of purchasing goods, the buyer needs to underline the quality of the

goods presented from the seller and, in return, the seller needs to confirm the creditworthiness of the buyer. Accordingly, when the market information is imperfect, there will be a number of transaction costs for both sellers and buyers that would be incurred when trying to obtain sufficient information to assess the risk associated with the transaction (Smith and Schnucker, 1994; Petersen and Rajan, 1997; Wilson and Summers, 2002).

Smith (1987) indicates that, due to capital market defects, sellers of credit can supply the buyers at a lower cost than what the financial institutions can offer. Petersen and Rajan (1997) point out that suppliers may have more power than traditional lenders when it comes to enforcing credit repayment and verifying the creditworthiness of their customers. Suppliers can therefore enjoy more advantages associated with information acquisition and negotiation power over the buyer. As a disposition of the financial motivation, Schwartz (1974) explains that, in order to maximize profits, companies with easy access to the financial markets have the incentive to sell (i.e., supply) financial resources to other companies that are financially constrained but have profitable investment opportunities. Within this context, Deloof and Overfelt (2011) suggest that the availability of financial resources from banks have contributed to the intermediary role played by the firms via borrowing credit from banks and supplying it to their customers. García-Teruel and Martínez-Solano (2010c) find that when the Spanish SMEs acquire more short-term finance, they give longer payment terms.[73] Wang, et al. (2021) suggest that European SMEs supply more trade credit when they are in a stronger bank financing position. Thus, we form the following hypothesis:

H1c (Intermediary Hypothesis)*:* UK SMEs use bank credit to complement trade credit supplied to the customers.

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[73] Following García-Teruel and Martínez-Solano (2010), we only treat short-term bank credit in the models of trade credit supplied because trade credit is short-term by nature (Wang, et al., 2021; Huyghebaert and Wang, 2016). For instance, when a company gives credit or sells goods on credit, and it experiences a deficit in the cash cycle (i.e., finance gap), particularly the small firms, it turns to banks with the guarantee of trade debtors, so that the bank finances the firm with short-term loans, in addition to imposing a certain interest rate on the company, or banks buy the trade debts at a discount (see Soufani, 2002).

5.2.2 FRS 102 (the new UK GAAP) and IFRS for SMEs

On 9 July 2009, the IASB issued the IFRS for SMEs primarily to meet the needs of users of financial statements for small and medium-sized enterprises and also to ease the financial reporting burden on SMEs (Ram and Newberry, 2013), in addition to include new specific requirements for SMEs (Jermakowicz and Epstein, 2010), and to create a simplified version of the IFRS, with a measurable reduction in the disclosure requirements and measurement principles (IASB 2009; Perera and Chand, 2015).The movement towards implementing IFRS for SMEs, however, remains disparate across countries (Ram and Newberry, 2013)[74] and, as a result, enterprises that were not subject to public accountability were following either GAAP or IFRSs in compliance with the laws of individual jurisdictions (Alp and Ustundag, 2009; Tyrrall, Woodward and Rakhimbekova, 2007). In the UK, there was a crucial need to update the national GAAP to find realistic solutions for both public interest, company size, information needs, and the company's complexity. Accordingly, in 2015, the FRC replaced the old UK GAAP with a new set of financial reporting with the aim of diminishing the intricacy and cost for organizations, while presenting a coherent and concise set of guidelines and standards to empower the financial statement users' of receiving a financial reporting featured with a high quality and comprehensibility that is suitable for the company size, its complexity, and the information needs of users (FRC FRS 102, 2015). *FRS 102* is the principal standard among the set issued as it includes new requirements for small entities in terms of intangible assets, goodwill, group defined benefit schemes and deferred tax. FRS 102 is largely based on the

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[74] Firstly, IASB's consultation processes on IFRS for SMEs have been regarded as having inadequately recognized the important role of the users of these standards (Quagli and Paoloni, 2012). Secondly, "moves for differential reporting are frequently driven by other groups than users, such as practitioners and academics" (Evans, et al., 2005, p. 38). Thirdly, users are less dynamic than the preparers, especially in the consultation processes (Ram and Newberry, 2013; Quagli and Paoloni, 2012). Fourthly, it has been asserted that users incorporated into the consultation process are not representative for SMEs (Ram and Newberry, 2013).

IFRS for SMEs, and the scope of the standard is applicable to various entities.[75] Firms can start adopting FRS 102 from the accounting periods starting from 1 January 2015 or afterwards, with early implementation permitted from 31 December 2012 or after (FRC FRS 102, 2015).

The transition from the old UK GAAP to FRS 102 has resulted in several significant changes, one of which is related to financial instruments, where the recognition and measurement of financial instruments has become wider.[76] Moreover, the various options provided under FRS 102 for valuing financial instruments will lead to a change in estimating the value of assets and liabilities (such as trade payables, trade receivables and debts), and therefore in the reporting of financial position. Hence, the issuance of FRS 102 provides an interesting setting to revisit the relationship between trade credit and bank financing.

5.2.3 FRS 102, trade credit and bank financing

Commonly, a trade credit occurs when a supplier permits the buyer to postpone the payment due. Trade creditors (i.e., suppliers of trade credit) usually do not impose interest on the sales credit but, rather, offer a discount for early settlement (Wilner, 1997; Ng, Smith and Smith, 1999). Wilner (2000) points out that the discount granted for prompt payment can be viewed as interest charges for late payments.[77] In comparison with bank finance, with the risk profile

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[75] FRS102 is applicable to unlisted or listed individual business, as well as unlisted groups in the UK. Essentially, it is applicable to UK entities that do not comply with the full IFRS (see https://www.iasplus.com/en-gb/standards/uk-gaap/frs102).

[76] FRS 102 categorizes financial instruments into basic financial instrument and more complex financial instruments. Basic financial instruments include several items such as trade payables, trade receivables, and direct bank loans which are measured at amortized cost, with some categories evaluated at fair value or cost. Nevertheless, FRS 102 categorizes financial instruments into basic financial instruments and more complex financial instruments. Basic financial instruments include a range of items such as trade payables, trade receivables, and direct bank loans, which are all measured at amortized cost, with some categories evaluated at fair value or cost. Trade payables and trade receivables that are due within one year are measured by the undiscounted amount of cash that is expected to be paid or received. The other complex financial instruments include items such as loans with complex conditions and foreign exchange forward contract, and these are measured at fair value (FRC FRS 102, 2015).

[77] "For example, cash discounts are very common in purchase agreements. When customers fail to pay within the discount period, the forgone cash discount can translate into significantly higher effective interest rates, compared to other types of financing" (Chen, et al., 2017. p.70).

held constant, trade credit is deemed more expensive, principally for customers with better accounting quality. Customers (as receivers of trade credit) are essentially given the choice of using either bank credit or trade credit to settle the payment. One the one hand, firms with better financial accounting quality would have easier access to bank credit and enjoy a lower interest rate, and hence, trade credit received is deemed more expensive as a source of finance. One the other hand, clients with lower accounting quality, i.e., higher information asymmetry, tend to restrict themselves to the use of trade credit rather than resorting to other types of financing because these firms that need to grant trade credit to their customers can obtain the information required via the day-to-day transactions rather than through annual reports (Chen, et al., 2017).

The association between trade credit and financial reporting quality has only been studied in a few research. For example, Raman and Shahrur (2008) show that companies engage in opportunistic earnings management to alter customers'/suppliers' perceptions of the company's prospects. Clients are more likely to utilise trade credit when they have a high level of information asymmetry, according to Ma and Martin (2013), and this is inferred from empirical evidence showing trade credit utilisation is negatively associated with financial report quality. Similarly, Chen, et al. (2017) document a negative association between trade credit and accounting quality for publicly listed firms in the U.S, and that the negative relationship is more prominent for firms with high information asymmetry. On the contrary, Li, Ng and Saffar (2021) find that listed firms adopting IFRSs are able to obtain more trade credit from their providers, and to grant more trade credit to their clients. They further suggest that the improvement in the quality and comparability of financial reports through the application of IFRS has eased the informal financing process. Within this context, when it comes to assessing the credit risks by the external capital suppliers (i.e., financial institutions or equity investors), the quality of the financial reports plays a significant role in mitigating information asymmetry and thus external financers are more inclined to finance firms with high accounting quality

(Biddle and Hilary, 2006). Elemes and Filip (2021) finds that trade credit is positively associated with financial reporting quality in the private firms, and this relationship is stronger when the future cash flow uncertainty and information asymmetry is high. Suggesting that suppliers complement internal transmission channels and financial reporting quality and maintain a better accurate understanding of the interaction between information asymmetry and trade credit financing. García-Teruel, Martínez-Solano and Sánchez-Ballesta (2014) find that Spanish industrial SMEs, over the period 1995-2005, that have high earnings quality receive more trade credit from their suppliers.

Prior studies have been inconclusive about the relationship between trade and bank credit, and the link between trade credit and accounting quality. However, the impact of financial reporting quality over the relationship between trade credit and bank credit remains an open question. Trade credit and bank credit are a crucial source of finance for SMEs (Palacín-Sánchez, Canto-Cuevas and di-Pietro, 2018), and SMEs make up more than 99% of all companies in the UK (Rhodes, 2019). FRS 102 was issued recently, in 2015, and is largely based on the IFRS for SMEs which have introduced new reporting requirements for UK SMEs, which then brought a significant change to the accounting of several key items, such as financial instruments (see FRC FRS 102, 2015). This provides an interesting setting to pose the following questions: would the role played by the UK SMEs as a receiver of trade credit (substitute or complementary) be affected by the adoption of FRS 102? Following prior studies, we consider the adoption of FRS 102 as a proxy of enhanced financial reporting quality. We then form the following hypothesis:

H2a*: FRS 102 has no moderating impact on the relationship between trade credit received and bank financing for the UK SMEs.

Assuming the quality of financial reports contributes to mitigating information asymmetry, external financiers tend to lend to companies with high financial reporting quality, and

accordingly, firms that receive credit are more likely to grant credit to their clients (Biddle and Hilary, 2006; Li, Ng and Saffar, 2021). Thus, we examine whether the role played by the SMEs as a supplier of trade credit is affected by the adoption of FRS 102, as a proxy of financial reporting quality:

H2b: FRS 102 has no moderating impact on the relationship between trade credit supplied and bank financing for the UK SMEs.

To sufficiently control for other variables that may affect the relationship between trade credit and bank loans, determinants of trade credit have been added to our research model as control variables.

5.2.4 Firm characteristics and other control variables

Firm size and *age* are included as proxies for firms' creditworthiness. Larger enterprises are considered as more creditworthy and it would be easier for them to extend the credit terms (Petersen and Rajan, 1997). Further, Yazdanfar and Öhman (2017) document that large Swedish SMEs have more opportunities than small SMEs to sign obligatory covenants legally with their suppliers and seek trade credit from their suppliers. Determining the impact of firm age on trade credit is inconclusive in the literature. Petersen and Rajan (1997) suggest that the age of an enterprise essentially reflects how long it has established its reputation with the customers. However, García-Teruel and Martínez-Solano (2010) find no significant evidence of the relationship between firm age and trade credit in the UK. *Growth* prospect is another important determinant influencing trade credit. García-Teruel and Martínez-Solano (2010) suggests that SMEs with the less growth in sales tends to stimulate their sales through increasing the level of trade credit granting, while SMEs with growth investment opportunities depend on financing from their suppliers, as they require more financing.

Financial cost is also associated with the level of trade credit. García-Teruel and Martínez-Solano (2010) suggest that when the cost of financial resources from banks is high, firms tend

to receive trade credit, and therefore the level of trade credit supplied decreased. *Cash flow* thus is a factor that determines trade credit. Petersen and Rajan (1997) argue that firms that have internal cash have more ability to grant credit to their clients and will be less dependent on financing from suppliers. *Purchases* are used in prior studies as a proxy for trade credit supply. Niskanen and Niskanen (2006) suggest that the growth in the trade credit provided by the suppliers improves the level of its use by the buyers. *Turn* as a proxy of product quality is suggested to have a positive relationship with the level of trade credit supplied, as the quality of the goods that SMEs produced is easily verifiable and therefore SMEs can finance their sales more than other entities (García-Teruel and Martínez-Solano, 2010b; 2010c).

In summary, this study contributes to the existing literature in two ways. First, prior studies have been inconclusive on whether trade credit complements or substitutes for bank finance (e.g., García-Teruel and Martínez-Solano, 2010; Ghosh, 2015; Yazdanfar and Öhman, 2017; Palacín-Sánchez, Canto-Cuevas and di-Pietro, 2018; Wang, et al., 2020). This warrants further analysis to ensure a better understanding of the nature of the relationship between trade credit and bank loans, particularly about SMEs that have been widely acknowledged as being more financially constrained and more reliant on trade credit and bank credit as a source of finance (Chant and Walker 1988; Berger and Udell, 1998; Danielson and Scott 2004; Canto-Cuevas, 2019). Our study, as a result, adds to this strand of literature by providing much needed empirical evidence from the perspective of SMEs. Secondly, few previous studies examine the relationship between financial reporting quality and firms' use of trade credit such as Chen, et al. (2017), Li, Ng and Saffar (2021), and García-Teruel, Martínez-Solano and Sànchez-Ballesta (2014). However, no study to date, to the best of our knowledge, has examined the impact of financial reporting quality over the relationship between trade credit and bank finance. Our paper intends to fill this gap with the implicit assumption that the financial reporting quality of SMEs has increased after their voluntary adoption of FRS102 in the UK. This would improve

our understanding of the role of financial reporting quality in moderating the mixed use of trade credit and bank finance by SMEs to fulfil their financing needs.

5.3 Research design

5.3.1 Study models and variables measurement

Following previous literature (e.g., Petersen and Rajan, 1997; García-Teruel and Martínez - Solano, 2010; Yazdanfar and Öhman, 2017), we test H1a, H1b, and H1c on the relationship between trade credit and bank credit by employing the following equations:

Equation (1) presents the relationship between trade credit received and bank credit to test (H1a vs. H1b):

$$Trade\ credit\ received_{it}$$
$$= \beta_0 + \beta_1 Leverage_{it} + \sum Control\ variables_{it} + a_i + b_t + \varepsilon_{it}$$

Equation (2) presents the relationship between trade credit supplied and bank credit to test (H1c):

$$Trade\ credit\ supplied_{it}$$
$$= \beta_0 + \beta_1 STLEV_{it} + \sum Control\ variables_{it} + a_i + b_t + \varepsilon_{it}$$

where, for firm *i* in year *t, Trade credit received* is measured as trade creditors over total assets; *Leverage* is the sum of short-term loans & overdrafts and long-term debt over total assets; *Trade credit supplied* is trade debtors over total sales;[78] *STLEV* is the short-term debt and measured by short-term loans & overdrafts over total sales; *Control variables* consist of *Firm size* measured as the logarithm of total assets; *Firm age* is the logarithm of number of years since inception; *Financial cost* is the financial expenses divided by the difference between total debt and trade creditors; *Cash flow* is the net profit plus depreciation over total sales; *Turn* is measured as total sales over the difference between total assets and trade debtors; *Purchases* is

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[78] Wang, et al. (2021) measure bank credit as the sum of short-term "loans" and "long-term debt". The FAME database provides data on "short-term loans & overdrafts" and "long-term debt", respectively. Thus, we use the sum of these two components to measure bank credit in this paper.

the cost of goods sold over total assets; *Sales growth* is the ratio of the annual growth in sales; α_i represents the firm-fixed effect and b_t the time-fixed effect. To test H2a and H2b, we use the generalized Difference-in-Differences (DID) with two-way fixed effect model, considering that *i)* the adoption of FRS 102 by SMEs was not simultaneous, i.e., our sample SMEs voluntarily adopted the FRS 102 at different times across the sample period;[79] *ii)* the dataset is an unbalanced panel data. Wing, Simon and Bello-Gomez (2018, pp. 456, 457) suggest that "the group effects and time trends stem from underlying differences in unmeasured covariates across groups and time periods… The DID design is meant to control for these unmeasured confounders even though the underlying variables are not measured explicitly".

Equation (3) is used to test the impact of FRS 102 on the relationship between trade credit received and bank credit to test (H2a):

$$
\begin{aligned}
Trade\ credit\ recevied_{it} \\
= \beta_0 + \beta_1 Leverage_{it} + \sum Control\ variables_{it} + \beta_3\ FRS\ 102_{it} \\
+ \beta_4\ FRS\ 102_{it} \times Leverage\ _{it} + \sum FRS\ 102_{it} \times Control\ variables_{it} \\
+ a_i + b_t + \varepsilon_{it}
\end{aligned}
$$

Equation (4) is used to test the impact of FRS 102 on the relationship between trade credit supplied and bank credit (H2b):

$$
\begin{aligned}
Trade\ credit\ supplied_{it} \\
= \beta_0 + \beta_1\ STLEV_{it} + \sum Control\ variables_{it} + \beta_3\ FRS\ 102_{it} \\
+ \beta_4\ FRS\ 102_{it} \times STLEV\ _{it} + \sum FRS\ 102_{it} \times Control\ variables_{it} + a_i \\
+ b_t + \varepsilon_{it}
\end{aligned}
$$

where, additionally, for firm *i* in year *t*, *FRS 102* is a binary variable coded one in the years of adoption and zero, otherwise. All covariate variables in the Equation (3) and (4) have been centered to improve the interpretation of the coefficients and to lessen the multicollinearity

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[79] Annual reports have been collected manually to identify the year of adoption of FRS 102.

(Williams, 2015; Afshartous and Preston, 2011).[80] In general, coefficients of variables before the interaction with FRS 102 represent the relationship with the trade credit before the adoption of the FRS 102. $\beta_{1} + \beta_{4}$ captures the relationship with trade credit after the FRS 102 adoption. β_3 shows the effect of FRS 102 conditional on covariate variables when they are equal to zero. Coefficients after the interaction with FRS 102 show the difference in effect before and after the adoption of FRS 102. For example, β_4 coefficients after the interaction with FRS 102 will capture the moderating impact of FRS 102 on the relationship between trade credit and bank finance (H2a and H2b).

5.3.2 Study sample and data collection

Since IFRS for SMEs was launched in 2009 (Jermakowicz and Epstein, 2010), and FRS 102 is based on the IFRS for SMEs which is applicable in the UK and republic of Ireland (FRC FRS 102, 2015), our test period is set to start in 2009 until the last available year of data for individual SMEs included in our sample.[81&82] We use the FAME database to obtain the financial reports to determine the adoption year of FRS 102 of individual sample SMEs, as well as the firm-level data required for our empirical analysis.

To identify the study sample,[83] we adopt a similar sampling logic used by Francis, et al. (2008),[84] where three lists of SMEs in the UK issued in different years (The Best SMEs, 2012;

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[80] The covariates have been centered by using STATA, where the process includes subtracting the average value of the covariate from each data point.

[81] The last available year for reports varied for our sample SMEs, which depends on the annual reports availability within the FAME database, and all of the sample SMEs have their last data available year as either 2018 or 2019.

[82] We have performed a robustness check on the 'common' sample (i.e., all firms have the same beginning and ending year), and the results remained qualitatively similar.

[83] Due to the absence of a unified definition of SMEs and owing to the variety of SMEs definitions all over the world in general (see UNCTAD, 2000a; ABS, 2002; Botosan, et al., 2006; IASB, 2009a; Pacter, 2009; Nobes, 2010; Perera and Chand, 2015; Ram and Newberry, 2013; Berisha and Pula, 2015), and in Europe in particular (i.e., EC's definitions of SMEs in 2003 and 2015), the process of determining the study sample was challenging.

[84] Francis, et al. (2008) examines incentives toward the adoption of IAS for SMEs and have relied on the World Business Enterprise Survey (WBES) conducted by the World Bank in 2002 to identify their study sample. The survey covers the period of late 1999 and early 2000. Following a similar logic of sampling SMEs, we form our sample of SMEs by relying on three different reports published by reliable authorities in three different years.

2014; 2018) have been used to derive our testing sample. Each list includes the Top 100 SMEs, identified using a combination of criteria such as workforce, innovation, productivity, number of employees, profit before tax, turnover, and the fastest-growing overseas sales. We combined the three lists of Top 100 SMEs so as to alleviate selection bias, but we nonetheless recognize that the inherent selection bias induced by this particular sampling method could have implications on our results.[85] A total of 2,314 annual reports have been collected manually to identify the year of adoption of FRS 102. The final data collected is an unbalanced panel. The total number of SMEs that have been included in the study sample is 248. A total of 236 SMEs adopted FRS 102 at some point during our sample period.[86] By 2018, all SMEs of the study sample have switched from the old UK GAAP to FRS 102. Around 29% of SMEs in the study sample made the switch in 2015, 51% in 2016, and 15% in 2017. Table 5.1 presents the sample selection criteria used.

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[85] It is possible that there will be no ability to generalize the results to population, but it is worth noting that FRS 102 came and brought about many changes, including financial instruments (FRC FRS 102, 2015), and that the changes could be clearly noticeable on the best SMEs, and if they are, then they would also be observable on the general SMEs. For instance, if the relationship between leverage and trade credit is found to be important for the best SMEs included in the study sample, then it should be also important to the general SMEs. In both instances, caution must be taken when interpreting results.

[86] A total of 12 firms have no annual reports in recent years, allowing us to see if they switched from the old UK GAAP to FRS 102.

Table 5.2 Sample Selection Criteria

Sample Selection Criteria	Number of firms
Initial sample of SMEs collected	300
Firms that adopted different standard, rather than FRS 102 during the study period	(20)
SMEs with incomplete data	(18)
Financial firms	(10)
Public quoted firms	(3)
Micro-entities	(1)
Total number of SMEs included in the study sample	248
Total number of annual reports collected manually, considering the data availability for each firm	2314
Percentage of SMEs in the study sample that made the switch to FRS 102 in 2015	29%
Percentage of SMEs in the study sample that made the switch to FRS 102 in 2016	51%
Percentage of SMEs in the study sample that made the switch to FRS 102 in 2017	15%

Notes: Some of SMEs were following the old UK GAAP and then switched to FRS 102, and then switched again, either to another accounting standard or they reversed back to the old UK GAAP. These firms have been deleted. Financial firms have been excluded. Micro entities have been also excluded as they are following FRS 105 under the new UK GAAP (FRC, 2015).

5.4 Empirical Results

5.4.1 Descriptive Statistics

Descriptive statistics for the trade credit, bank credit, and SMEs characteristics are presented in Table 5.2. The mean (median) values of trade credit received are 11.7% (7%) and those of trade credit supplied are 16% (15.4%). This implies that the trade credit supplied is higher than the trade credit received. This could indicate that SMEs would borrow from banks and then extend the credit received to their clients, an intermediary role as suggested by Deloof and Van Overfelt (2011). *Leverage* (i.e., bank credit) accounts for 22.7% of SMEs total assets, in comparison with the mean bank credit ratio (21.8%) documented in the previous studies such

as Wang, et al. (2020),[87] which suggests that the characteristics of our sample SMEs is comparable with other prior studies. Since trade credit by nature is short-term (Wang, et al., 2020; Huyghebaert and Wang, 2016), the results show that both short-term debt 11.75% (6.14%) and STLEV 14.71% (4%) are not substantially different from trade credit received 11.72% (7.43%). Long-term debt, however, accounts for 13.68% (8.11%) of SMEs total assets and is higher than trade credit received. This shows that SMEs in the study sample rely on long-term debt bank financing more than trade credit received. Overall, the descriptive results of the main variables of interest (i.e., bank financing and trade credit) could suggest that our sample SMEs generally have good access to bank finances, as suggested by the level of leverage (i.e., bank financing) which is higher than the trade credit that is both received and supplied. The descriptive statistics of our sample SMEs are largely comparable with those documented in prior studies such as García-Teruel and Martínez-Solano (2010) as well as Yazdanfar and Öhman (2017).

Table 5.3 presents the changes in the mean (median) level of trade credit and bank financing over the sample years. The results show that the mean (median) level of *Trade credit supplied* is consistently higher than that of *Trade credit received* over the years. Interestingly, it is noted that the level of trade credit (both *Trade credit supplied,* and *Trade credit received*) was increasing monotonically, whereas bank financing (*Leverage, Short-term debt,* and *STLEV*), was monotonically decreasing, except for *Long-term Debt*. Overall, when comparing the results of leverage (i.e., bank financing) with both levels of trade credit, the results show that the level of bank financing is higher than that of the trade credit over the sample years, and this is consistent with the results reported in Table 5.2 which suggest that SMEs rely more on bank financing than trade credit.

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[87] The study of Wang, et al. (2021) has been conducted on the European SMEs during the period from 2006 to 2015.

Table 5.2 Descriptive Statistics

Variables	Mean	Std.dev	Q1	Median	Q3	Number of observations	Number of firms
Trade credit received	0.1172	0.1394	0.0057	0.0743	0.1768	2314	248
Trade credit supplied	0.1600	0.1336	0.0908	0.1544	0.2068	1616	225
Leverage	0.2270	0.3616	0.0418	0.1429	0.3193	1462	231
Short-term debt	0.1175	0.1821	0.0153	0.0614	0.1536	1395	225
Long-term debt	0.1368	0.1559	0.0181	0.0811	0.2040	942	171
STLEV	0.1471	0.4025	0.0099	0.0409	0.1089	1295	212
Firm size	6.7245	0.4805	6.4747	6.7460	7.0162	2267	247
Age	1.2293	0.3289	1.0000	1.2304	1.4472	2314	248
Financial cost	0.0218	0.0239	0.0058	0.0154	0.0301	1279	209
Cashflow	0.0933	0.2507	0.0326	0.0775	0.1365	1677	227
Turn	3.0084	4.1893	1.2805	2.1303	3.5225	1677	227
Purchases	1.2338	0.9530	0.6138	1.0000	1.5672	1287	186
Sales growth	0.1820	1.6964	-0.0484	0.0546	0.1733	1478	219

Notes: *Trade credit received is* trade creditors over total assets. *Trade credit supplied* as trade debtors over total sales. *Leverage* is the sum of short-term loans & overdrafts and long-term debt over total assets. *Short-term debt* is short term loans & overdrafts over total assets. *Long-term debt* is long term debt over total assets. *STLEV* is the short-term debt and measured by short-term loans & overdrafts over total sales. *Firm size* is the logarithm of total assets. *Firm age* is the logarithm of number of years since inception. *Financial cost* is the financial expenses divided by total debt minus trade creditors. *Cash flow* is the net profit plus depreciation over total sales. *Turn* measured by total sales over total assets minus trade debtors. *Purchases* is the purchases over the total assets. *Sales growth* is the annual growth rate in sales. *Covariates* trimmed at 1 and 99 percentiles to control for the effect of outliers. The independent variables have been centered.

Table 5.3 Descriptive statistics for trade credit and bank financing by year

Year	Trade credit received (%)	Trade credit supplied (%)	Leverage (%)	Short-term debt (%)	Long-term debt (%)	STLEV (%)
2009	**11.58**	**14.44**	**29.97**	**19.95**	**13.57**	**20.64**
	(4.34)	(13.88)	(17.33)	(7.18)	(7.17)	(4.24)
2010	**12.32**	**18.53**	**25.48**	**15.29**	**12.68**	**12.93**
	(7.27)	(15.39)	(17.41)	(9.99)	(7.00)	(6.78)
2011	**12.84**	**16.46**	**23.76**	**13.57**	**14.60**	**10.00**
	(7.57)	(16.46)	(15.56)	(6.61)	(10.02)	(4.88)
2012	**12.19**	**14.53**	**23.63**	**13.76**	**15.45**	**15.51**
	(7.15)	(14.67)	(14.39)	(6.88)	(9.50)	(3.54)
2013	**10.98**	**15.61**	**21.52**	**12.38**	**13.69**	**12.96**
	(7.18)	(15.91)	(13.75)	(5.56)	(10.30)	(3.48)
2014	**10.86**	**15.76**	**22.82**	**14.57**	**13.42**	**13.82**
	(6.57)	(15.65)	(12.12)	(6.95)	(8.27)	(3.98)
2015	**10.04**	**16.47**	**24.48**	**15.55**	**14.00**	**17.40**
	(6.22)	(15.62)	(14.10)	(4.76)	(7.58)	(3.35)
2016	**10.75**	**15.99**	**28.65**	**11.07**	**12.96**	**18.41**
	(7.11)	(15.20)	(14.16)	(5.85)	(6.32)	(3.70)
2017	**12.98**	**16.13**	**34.21**	**11.44**	**13.41**	**16.39**
	(9.00)	(16.00)	(11.77)	(5.45)	(6.21)	(4.32)
2018	**12.45**	**15.93**	**20.05**	**10.22**	**14.44**	**10.02**
	(9.18)	(15.18)	(11.76)	(5.12)	(8.08)	(3.47)
2019	**16.53**	**16.61**	**13.90**	**6.90**	**14.01**	**4.46**
	(10.12)	(14.79)	(12.14)	(6.21)	(7.79)	(3.45)

Notes: *Trade credit received is* trade creditors over total assets. *Trade credit supplied* as trade debtors over total sales. *Leverage* is the sum of short-term loans & overdrafts and long-term debt over total assets. *Short-term debt* is the short-term loans & overdrafts over total assets. *Long-term debt* is long-term debt over total assets. *STLEV* is the short-term loans & overdrafts over total sales. The **mean** (*median*) values are calculated annually.

Table 5.4 compares the difference of the level of trade credit and bank finance pre-and post-FRS 102 adoption. Since the data structure is unbalanced panel and the adoption process of FRS 102 is not simultaneous, a generalized t-test is used. The results show that the levels of both trade credit and bank finance have changed after the adoption of FRS 102, significant at 1% level. Further, *trade credit supplied* is higher than *trade credit received*, however the marginal increase of *trade credit supplied* after the application of the FRS 102 is not substantial, which suggests the level of *trade credit supplied* to the customers are less sensitive to the adoption of FRS102 and remains unchanged. Also, *Leverage* and its components have significantly decreased after the adoption of FRS 102, while financial cost increased. This

could imply that creditors of these SMEs (i.e., banks) would treat the adoption of FRS102 as a signal of enhanced financial reporting quality that could reveal the true level of risk associated with loans under the old UK GAAP, and thus banks may adjust their interest charges upward. Further investigation via regression analysis is then warranted in this regard.

Table 5.4 Generalized t-test for trade credit and bank financing

Variables	Before/After FRS 102 adoption	Mean (%)	Std. Err (%)	Probability
Trade credit received	Before	10.51	0.37	0.000
	After	14.34	0.72	0.000
Trade credit supplied	Before	15.58	0.60	0.000
	After	16.83	1.10	0.000
Leverage	Before	29.52	2.27	0.000
	After	17.77	3.94	0.000
Short-term debt	Before	13.74	1.81	0.000
	After	13.42	3.22	0.000
Long-term debt	Before	14.78	0.72	0.000
	After	11.78	1.44	0.000
STLEV	Before	15.23	1.90	0.000
	After	13.65	3.58	0.000
Financial cost	Before	1.09	0.06	0.000
	After	1.28	0.12	0.000

Notes: *Trade credit received is* trade creditors over total assets. *Trade credit supplied* as trade debtors over total sales. *Leverage* is the sum of short-term loans & overdrafts and long-term debt over total assets. *Short-term debt* is the short-term loans & overdrafts over total assets. *Long-term debt* is long term debt over total assets. *STLEV* is the short-term loans & overdrafts over total sales. *Financial cost* is the financial expenses divided by total debt minus trade creditors.

5.4.2 Correlation analysis

The correlation matrix of the study variables for the whole sample is presented in Table 5.5. Panel A (B) reports the correlation matrix between *Trade credit received* (*Trade credit supplied*) and the other variables. We conduct the pairwise correlation analysis to determine the strength and direction of relationships, in addition to checking the possibility of a high correlation between the study variables. Our results show that *Trade credit received* has a positive correlation with *FRS 102* (r=0.039), significant at 1%. This could suggest that SMEs

which adopted FRS 102 would receive more trade credit from their supplier. This supports the findings of Li, Ng and Saffar (2021) who suggest that improving the quality of financial reports through the application of IFRS contributes to facilitating the process of obtaining financing from suppliers. *Trade credit supplied* has no significant correlation with *FRS 102*, but the direction of the association is positive. Further, Panel A shows that *Leverage* has a negative correlation with *Trade credit received* (r=0.1908), significant at 1%. This could imply a substitute relationship between trade credit received and bank finance (*leverage*). To contribute to a better understanding of the empirical relationship between trade credit and bank finance, we also investigate the relationship between *Trade credit received* and different debt components (i.e., *Long-term debt* and *Short-term debt*). Panel A shows that *Long-term debt* is negatively correlated with *Trade credit received* (r= -0.242), significant at 1%. This implies a substituting relationship between *Long-term debt* and *Trade credit received.* Although the *short-term debt* has no significant relationship with *trade credit received,* the direction of the association is negative. Panel A of Table 5.5 also shows that *Purchases* is positively correlated with *Trade credit received*, significant at 1%.

Panel B shows that *STLEV* has no significant relationship with *Trade credit supplied,* but the direction of the relationship is positive, which is in line with Deloof and Overfelt's (2011) argument that the availability of short-term bank financing would enable firms to play an intermediary role through obtaining credit from banks and then supplying it to their customers. Further, *Firm size* has a negative relationship with both *Trade credit supplied* (r=-0.049) at a significant level of 5%. This may imply that large entities would supply less trade credit compared to small entities. This supports the arguments of Long, Malitz and Ravid (1993) and García-Teruel and Martínez-Solano (2010) that smaller enterprises have a lower reputation and less desire to make greater use of trade credit to maintain their product. Panel B of Table 5.5 also shows that *Financial cost* has a negative relationship with *Trade credit supplied* (r= -0.106), significant at 1%, which supports the findings of García-Teruel and Martínez-Solano

(2010) that firms are less inclined to supply credit to their clients when they incur higher costs to match the finance received from their suppliers. Overall, the correlation amongst the variables does not cause concerns over collinearity issues. Nonetheless, multicollinearity tests are examined in the regression analysis section below.

Table 5.5 Correlation matrix

Panel A Trade credit received.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Trade credit received	1.000								
(2) FRS 102	0.039*	1.000							
(3) Leverage	-0.078***	0.021	1.000						
(4) Long-Term Debt	-0.242***	-0.017	0.770***	1.000					
(5) Short-Term-Debt	-0.019	-0.044*	0.755***	-0.004	1.000				
(6) Firm size	-0.025	0.263***	0.003	0.252***	-0.134***	1.000			
(7) Financial cost	-0.035	-0.029	0.110***	0.204***	0.023	0.118***	1.000		
(8) Purchases	0.572***	-0.111***	-0.088***	-0.238***	-0.011	-0.594***	-0.050	1.000	
(9) Sales growth	-0.003	-0.034	-0.012	-0.021	-0.006	-0.028	0.012	0.038	1.000

Panel B Trade credit supplied.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Trade credit supplied	1.000								
(2) FRS 102	0.013	1.000							
(3) STLEV	0.007	0.011	1.000						
(4) Firm size	-0.049**	0.238***	0.201***	1.000					
(5) Firm age	-0.037	0.195***	0.087***	0.401***	1.000				
(6) Financial cost	-0.106***	-0.040	0.085***	0.066**	0.001	1.000			
(7) Cashflow	0.037	0.073***	0.005	0.276***	0.075***	-0.013	1.000		
(8) Turn	-0.026	-0.092***	-0.124***	-0.475***	-0.164***	-0.074***	-0.105***	1.000	
(9) Sales growth	-0.013	-0.034	-0.015	-0.015	-0.101***	0.037	0.004	0.002	1.000

Notes: *Trade credit received is* trade creditors over total assets. *Leverage* is the short-term loans & overdrafts and long-term debt over total assets. *Long-term debt* is long term debt over total assets. *Short-term debt* is the short-term loans & overdrafts over total assets. *Firm size* measured as the logarithm of total assets. *Financial cost* is the financial expenses divided by total debt minus trade creditors. *Purchases* is the cost of goods sold over total assets. *Sales growth* is the ratio of the annual growth in sales. *Trade credit supplied* is trade debtors over total sales; *FRS 102* is a binary variable coded one in the years of adoption and zero otherwise. *STLEV* is the short-term debt and is measured by short-term loans & overdrafts over total sales; *Cash flow* is the net profit plus depreciation over total sales; *Turn* is measured as total sales over the difference between total assets and trade debtors. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

5.4.3 Regressions results

Table 5.6 presents the results as detailed in Equation (1) – (3) in the research design section. The first model in Table 5.6 is the baseline model which examines the relationship between *Trade credit received* and bank finance for the whole sample period. The coefficient of *Leverage* in the baseline model is used to test H1a and H1b. The second model in Table 5.6 is the generalized DID with two-way fixed effect for *Trade credit received,* and the results before and after the adoption of FRS 102 are presented in two columns. The first column presents the results between *Trade credit received* and the study variables before the adoption of FRS 102. The second column represents the results with interaction between *FRS 102* and the study covariates. The coefficient of *Leverage* in the second column (i.e., after the interaction with *FRS 102*) in the DID model for *Trade credit received* will be used to examine the impact of FRS 102 on the relationship between trade credit received and bank finance (H2a).

Table 5.7 presents the results as specified in Equation (2) – (4). The first model is the baseline model for *Trade credit supplied* which examines the relationship between *Trade credit received* and short-term bank finance for the whole period. The coefficient of *STLEV* in the baseline model is used to examine the intermediary hypotheses (H1c). The second model in Table 5.7 is the generalized DID with two-way fixed effect for *Trade credit received,* and again in two columns. Similarly, the first column is before the interaction with FRS 102 which shows the relationship between *Trade credit supplied* and the study variables before the adoption of FRS 102. The second columns represent the interaction between *FRS 102* and the study covariates. The coefficient of *STLEV* in the second column of the DID model for *Trade credit supplied* after the interaction with *FRS 102* is used to examine the impact of FRS 102 on the relationship between *Trade credit supplied* and short-term bank finance (H2b).

Since our sample SMEs switched to FRS 102 at different year over the sample period, i.e., the adoption of FRS 102 is not simultaneous, the effect of FRS 102 adoption may vary with time.

As a robustness check, we also run the generalized DID with 'two-way fixed effect model' with lagged variables (Wing, Simon and Bello-Gomez, 2018) in Tables 6 and 7 for *Trade credit received* and *Trade credit supplied*, respectively. The lagged variables indicate any incremental effect of each additional year, where a positive coefficient of the interaction between *Lag* and *FRS 102* would suggest whether the adoption of FRS 102 has more prominent effect over time, and a negative coefficient would suggest that the effect of FRS 102 has been diminishing over time. Similarly, variables in the first column (before the interaction) show the relationship before the adoption of FRS 102, while variables in the second column (after the interaction) represent the effect of FRS 102 on the relationship between the study covariates and trade credit.[88]

Also, the baseline models for *Trade credit received* in Table 5.6 and for *Trade credit supplied* in Table 5.7 are estimated with fixed-effect estimator using the Hausman test.[89] The mean Variance of Inflation (VIF) is checked for all models in Table 5.6 and Table 5.7 to assess the collinearity issue. Across all models, the mean value of VIF is less than 10, which implies that the collinearity does not pose any genuine concern regarding the empirical results (Gujarati, 2009).

Results in Table 5.6 for the baseline model in the first column shows that *Leverage* has a negative relationship with *Trade credit received*, at a significance level of 5%, over the whole sample period. Similarly, for the DID model results before the interactions are added.

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[88] Years 2015, 2016, and 2017 have been chosen as most of SMEs in the study sample have adopted FRS 102 in these years. For firm i in year t Lag1 is coded one for firm i in the first year after the adoption and all subsequent years, and zero otherwise. Lag2 is coded one for firm i in the second year after the adoption and all subsequent years, and zero otherwise. Lag3 is coded one for firm i in the third year after the adoption, and all subsequent years, and zero otherwise.

[89] The probability of the Chi^2 of the Hausman test is significant at 1% for the trade credit received model, while it is not significant for trade credit supplied model. The fixed effect estimator applied in both models address the issue of omitted variable bias (Wooldridge, 2010). The random-effect model also applied for the trade credit supplied model and the results are qualitatively similar.

Consistent with Wang, et al. (2021), we find that UK SMEs use bank financing as substitute for *Trade credit received* prior to their adoption of FRS 102. Thus, the substitution hypothesis (H1a) cannot be rejected. This suggest that SMEs lower their credit levels from suppliers when they have access to bank financing, which is consistent with García-Teruel and Martínez-Solano (2010a) that when firms have easy access to bank finance, they would reduce their level of debt from suppliers, particularly when the cost of finance from suppliers is high. However, the results of the DID model after the interaction with *FRS 102* shows that the adoption of FRS 102 has a positive effect on the relationship between *Trade credit received* and bank financing, significant at 10%. Accordingly, the substitution relationship has weakened after the adoption of FRS 102, since the coefficient of *Leverage* before the adoption is -0.0542 and after the adoption is -0.0145 (-0.0542+0.0397). Nonetheless, we observed in Tables 3 and 4 that the level of bank financing obtained by the sample SMEs has decreased and both financial cost and the level of *Trade credit received* has increased after the adoption of FRS 102. One plausible explanation for these results is that the enhanced financial reporting quality associated with the adoption of FRS 102 of UK SMEs allowed them to have better access to bank finance since trade credit is usually regarded as more expensive.[90] However, with the improved quality of financial information disclosure and level of information asymmetry alleviated, creditors such as banks would be able to better assess the financial risk associated with lending to the UK SMEs, and to subsequently adjust their interest charges upward. This has made it harder and more expensive for SMEs to obtain bank credit, forcing them to rely more on trade credit received from their suppliers as a substitute. And, hence, we reject the null hypothesis (H2a), and we accept the alternative that *FRS 102* has a significant moderating effect over the relationship between *Trade credit received* and bank finance (*Leverage*).

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[90] Chen, et al. (2017) suggest that firms with higher financial reporting quality have better access to traditional sources of finance and then are less likely to use the trade credit since it is comparatively more costly.

As for the control variables, the results in Table 5.6 show that *Firm size* has no significant association with *Trade credit received*. Yazdanfar and Öhman (2017) point out that large SMEs have more opportunities to sign legally binding pledges with their suppliers (i.e., to receive more trade credit), however, this does not seem to be the case in our study. Although *Financial cost* increased after the adoption of FRS 102 as reported in Table 5.4, it has no significant relationship with *Trade credit received* before the adoption of FRS 102. However, the positive coefficient could suggest that, before the adoption of FRS 102, SMEs would resort to trade credit when the cost of bank credit is high. However, the adoption of FRS 102 (i.e., after the interaction with *FRS 102*) does not significantly alter this relationship. *Purchases* in the baseline model for the whole sample period and before the interaction with *FRS 102* (i.e., before the adoption of FRS 102) shows a positive relationship with *Trade credit received* at 1% significance level. This is intuitively sensible as the increase in transactions with suppliers should boost the level of *Trade credit received* (Niskanen and Niskanen, 2006). There is, however, no significant evidence to support that the adoption of FRS 102 has affected the relationship between *Purchases* and *Trade credit received*. *Sales growth* denotes no significant relationship with *Trade credit received* in the baseline model. However, the results of the DID model show that *sales growth* has a negative association with *trade credit received* before the adoption of FRS 102, significant at 1%. This implies that, before the adoption of FRS 102, SMEs with high sales growth have less demand on trade credit and have increased demand for bank finance. However, the results of the DID model after the interaction with *FRS 102* shows that the adoption of FRS 102 has a positive effect on the relationship between *Trade credit received* and *sales growth*, significant at 1%. Hence, the substitution relationship has been changed to a complementary after the adoption of FRS 102, since the coefficient of *sales growth* before the adoption is -0.0038 and after the adoption is 0.0485 (-0.0038+0.0523). This suggests that, after the adoption of FRS 102, SMEs with high growth opportunities demand

more funds from their suppliers. This supports the suggestion of García-Teruel and Martínez-Solano (2010b) that firms with high sales growth rely on their creditors (i.e., their suppliers) to finance their sales.

Table 5.6 Trade credit received and bank financing.

	Baseline model for trade credit received	DID model for Trade credit received		DID time lagged model for Trade credit received	
	H1a vs. H1b	H2a		H2a	
	Full sample period	*Before the interaction with FRS102*	*After the interaction with FRS102*	*Before the interaction with FRS102*	*After the interaction with FRS102*
Leverage	-0.0264**	-0.0542**	0.0397*	-0.0544**	0.0401*
	(0.0115)	(0.0244)	(0.0221)	(0.0246)	(0.0224)
Firm size	0.0167	0.0189	-0.0298	0.0182	-0.0289
	(0.0283)	(0.0325)	(0.0188)	(0.0321)	(0.0190)
Financial cost	0.1355	0.2129	-0.0461	0.2222	-0.0941
	(0.1316)	(0.1861)	(0.2814)	(0.1870)	(0.2670)
Purchases	0.0469***	0.0422***	-0.0072	0.0425***	-0.0060
	(0.0126)	(0.0131)	(0.0102)	(0.0131)	(0.0105)
Sales growth	-0.0012	-0.0038***	0.0523***	-0.0037***	0.0526***
	(0.0029)	(0.0009)	(0.0113)	(0.0009)	(0.0111)
FRS 102		0.0062		0.0096	
		(0.0110)		(0.0115)	
Lag1 × FRS 102					0.0179
					(0.0129)
Lag2 × FRS 102					0.0044
					(0.0140)
Lag3 × FRS 102					0.0040
					(0.0180)
Constant	-0.0066	0.1646***		0.1650***	
	(0.1956)	(0.0101)		(0.0103)	
R^2	0.1297	0.1815		0.1845	
F	3.6560***	5.7343***		5.1901***	
Firms	Included	Included		Included	
Years	Included	Included		Included	
N	780	780		780	

Notes: This Table reports the results of the relationship between *Trade credit received* and bank credit (*Leverage*). The Baseline model reports the results for the whole sample period (i.e., 2009-2019). The DID model is the generalized DID with group fixed effect and time fixed effect, which reports the results before the adoption of FRS 102 (i.e., before the interaction with *FRS 102*), and the results of the impact of FRS 102 on the relationship between *Trade credit received* and bank credit (i.e., after the interaction with *FRS 102*). The DID time lagged model is the lagged generalized DID with group fixed effect and time fixed effect for examining whether the effect of FRS 102 varies with time, which is a robustness check model for the DID model. *Covariates are* trimmed at (1 and 99) percentile to control for the effect of outliers. The independent variables have been centered. Standard errors are displayed in parentheses. The robust standard errors clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

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Table 5.6 shows the results of robustness check using the lagged DID model that the interaction of FRS 102 with both Lag1 and Lag3 has no significant relationship with *Trade credit received.* This implies that the effect of the adoption of FRS 102 remains significant over 2015 and 2017. *Lag2* shows a positive relationship with *Trade credit received*, at a significance level of 10%, which indicates that *FRS 102* has more prominent effect in year 2016 as around 51% of SMEs in the study sample adopted the new standards in 2016. Overall, the results of the covariates in the DID time lagged model are not meaningfully altered from those in other models, which confirms the robustness of our results.

Table 5.7 presents the results on the relationship between *Trade credit supplied* and short-term bank financing. Results from the baseline model in the first column *STLEV* has a positive relationship with trade credit supplied over the whole sample period, statistically significant at 10%. Thus, H1(c) can be confirmed: that SMEs do play the role of financial intermediaries by obtaining short-term loans from banks to finance their sales activities via extending credit to their customers; this is in the line with the Deloof and Overfelt (2011) and García-Teruel and Martínez-Solano (2010b; 2010c). The results in the DID model show that *STLEV* before the interaction with *FRS 102* (i.e., before the adoption of FRS 102) also has a positive relationship with *Trade credit supplied* at a level of significance of 10%, while the results in the second column (i.e., after the interaction with *FRS 102*) show that the adoption of FRS 102 has no significant impact on the relationship between *Trade credit supplied* and short-term bank finance. This implies that FRS 102 does not affect SMEs' decision of granting credit to their customers, and thus customers, as recipients of trade credit, would be indifferent to whether our sample SMEs adopted FRS 102 or not. Hence, we accept the null hypothesis (H2a).

Firm size is positively correlated with *Trade credit supplied* in the baseline model over the whole sample period at a 1% level of significance, and there is also a positive relationship in the DID model before the interaction with *FRS 102* (i.e., before the adoption of FRS 102) at a

level of significance 1%. This implies that larger SMEs supply more trade credit to their customers. However, it seems that FRS 102 does not affect this relationship. *Firm age* provide no significant evidence in the baseline and DID models. This is in line with García-Teruel and Martínez-Solano (2010a) who find no significant evidence of the relationship between firm age and trade credit in the UK. *Financial cost* does not provide significant evidence in neither the baseline model nor the DID model, while the negative coefficient implies that SMEs would supply more trade credit when they could enjoy a lower cost of finance.

Cashflow demonstrates a positive association with *Trade credit supplied* at a significant level of 1% in the baseline model over the whole sample period. Further, the results of the DID model, before the adoption of FRS 102, shows that *Cashflow* has a positive relationship with *Trade credit supplied* at a significant level of 1%. Also, the cashflow shows a positive relationship, significant at 1%, after the interaction with FRS 102 (i.e., after FRS 102 adoption). This implies that FRS 102 adoption has improved the relationship between *Cashflow* and *Trade credit supplied* as the coefficient of *Cashflow* before the adoption is 0.0334 and after the adoption is 0.1554 (0.0334+0.122). This suggests that, after the adoption of the FRS 102, UK SMEs are experiencing better prospects to develop internal funds, which in turn increases the level of trade credit granted to their customers (Petersen and Rajan, 1997). *Turn* shows a positive association, statistically significant at 10%, in the baseline model over the whole sample period. This is in the line with the suggestion of García-Teruel and Martínez-Solano (2010b) that the quality of the SMEs' products is readily demonstrable and can promote their sales through extending trade credit. However, the results of the DID provide no significant evidence for the relationship.

Table 5.7 Trade credit supplied and short-term bank financing

	Baseline model for trade credit supplied	DID model for trade credit supplied		DID time lagged model for trade credit supplied	
	H1c	H2b		H2b	
	Full sample period	*Before the interaction with FRS 102*	*After the interaction with FRS 102*	*Before the interaction with FRS 102*	*After the interaction with FRS 102*
STLEV	0.0254*	0.0209*	-0.0062	0.0203*	-0.0069
	(0.0141)	(0.0117)	(0.0224)	(0.0112)	(0.0239)
Firm size	0.0631***	0.0666***	-0.0287	0.0642**	-0.0272
	(0.0213)	(0.0250)	(0.0191)	(0.0248)	(0.0188)
Firm age	0.0439	0.0468	0.0088	0.0463	0.0056
	(0.0450)	(0.0532)	(0.0175)	(0.0515)	(0.0183)
Financial cost	-0.1478	-0.1397	0.0233	-0.1401	-0.0213
	(0.1037)	(0.1251)	(0.1675)	(0.1262)	(0.1650)
Cashflow	0.1332***	0.0334***	0.1220***	0.0322***	0.1252***
	(0.0352)	(0.0124)	(0.0212)	(0.0118)	(0.0203)
Turn	0.0045*	0.0046	-0.0008	0.0045	-0.0000
	(0.0027)	(0.0030)	(0.0024)	(0.0029)	(0.0023)
Sales growth	0.0001	-0.0001	0.0156	-0.0001	0.0135
	(0.0004)	(0.0004)	(0.0121)	(0.0004)	(0.0116)
FRS 102		0.0116		0.0169	
		(0.0094)		(0.0104)	
Lag1 × FRS 102					0.0163
					(0.0107)
Lag2 × FRS 102					0.0208*
					(0.0123)
Lag3× FRS 102					0.0128
					(0.0136)
Constant	-0.3659**	0.1381***		0.1388***	
	(0.1619)	(0.0080)		(0.0081)	
R^2	0.2633	0.3061		0.3117	
F	3.7239***	10.3726***		10.8277***	
Firms	Included	Included		Included	
Years	Included	Included		Included	
N	924	924		924	

Notes: This Table reports the results of the relationship between *Trade credit supplied* and short-term bank credit (*STLEV*). The Baseline model reports the results for the whole sample period (i.e., 2009-2109). The DID model is the generalized DID with group fixed effect and time fixed effect, which reports the results before the adoption of FRS 102 (i.e., before the interaction with *FRS 102*), and the results of the impact of FRS 102 on the relationship between *Trade credit supplied* and short-term bank credit (*STLEV*) (i.e., after the interaction with *FRS 102*). The DID time lagged model is the lagged generalized DID with group fixed effect and time fixed effect for examining whether the effect of FRS 102 vary with time, which is a robustness check model for the DID model. The independent variables have been centered. *Firm size, financial cost, and sales growth* have been trimmed at (1 and 99) percentile to control for the effect of outliers. Standard errors are displayed in parentheses. The robust standard errors clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

Sales growth denotes no significant relationship with trade credit neither in the baseline model nor in the DID model. The results of the DID time lagged model for *Trade credit supplied* shows that the interaction between *Lag2* and *FRS 102* has a positive relationship with *Trade credit supplied*, at a significance level of 10%, which indicates that *FRS 102* has an incremental effect in 2016 as most of SMEs included in the study sample, around 51% of the total number of SMEs, adopted FRS 102 in 2016. However, the interaction of *FRS 102* with both *Lag1* and *Lag3* has no significant relationship with *Trade credit supplied*. This implies that the effect of FRS 102 did not vary over time, particularly during the years 2015 and 2017. The covariates reported in the DID time lagged model are qualitatively similar to those reported in other models. And hence our results are robust.

5.5 Further analysis

Our main results of the DID model with two-way fixed effect suggests that FRS 102 has weakened the relationship between *Trade credit received* and bank finance (*Leverage*). Prior studies suggest that both short- and long-term debt could complement or substitute for trade credit received (e.g., García-Teruel and Martínez-Solano, 2010; Yazdanfar and Öhman, 2017; Palacín-Sánchez, Canto-Cuevas and di-Pietro, 2018). This warrants further analysis to examine the empirical relationship between different debt components (i.e., *Long term debt* and *Short-term debt*) and *Trade credit received*, and also the impact of the adoption of FRS102 over the respective relationship.[91]

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[91] The results of the DID, with a two-way fixed effect model of the trade credit supplied, suggest that FRS 102 has no significant impact on the relationship between trade credit supplied and short-term bank financing, and therefore, further analysis of the trade credit supplied and short-term bank financing is not our main concern.

Table 5.8 Generalized DID results - *Leverage* **decomposed into** *Long-term* **and** *Short-term debt*

	Baseline model for trade credit received	DID model for trade credit received		DID time lagged model for trade credit received	
	Full sample period	*Before the interaction*	*After the interaction*	*Before the interaction*	*After the interaction*
Short-term debt	-0.0316	-0.0169	-0.0639	-0.0165	-0.0638
	(0.0476)	(0.0467)	(0.0579)	(0.0466)	(0.0583)
Long-term debt	-0.0962**	-0.1023**	0.0605*	-0.1025**	0.0614*
	(0.0375)	(0.0431)	(0.0350)	(0.0435)	(0.0356)
Firm size	0.0037	0.0128	-0.0317*	0.0118	-0.0318*
	(0.0356)	(0.0372)	(0.0162)	(0.0375)	(0.0161)
Financial cost	0.3143	0.2509	0.3162	0.2510	0.3106
	(0.2106)	(0.2176)	(0.2176)	(0.2178)	(0.2217)
Sales growth	-0.0002	-0.0004	0.0406***	-0.0004	0.0405***
	(0.0008)	(0.0009)	(0.0141)	(0.0009)	(0.0141)
FRS 102		0.0013		0.0024	
		(0.0120)		(0.0127)	
Lag1 × FRS 102					0.0061
					(0.0131)
Lag2 × FRS 102					0.0020
					(0.0132)
Lag3 × FRS 102					0.0021
					(0.0184)
Constant	0.1218	0.1348***		0.1350***	
	(0.2458)	(0.0159)		(0.0160)	
R^2	0.0642	0.0985		0.0989	
F	1.4518	2.0132		1.7744	
Firms	Included	Included		Included	
Years	Included	Included		Included	
N	708	708		708	

Notes: This Table reports the results of the relationship between *Trade credit received* and the decomposed bank loan (*Short-term debt* and *Long-term debt*). The Baseline model reports the results for the whole sample period (i.e., 2009-2109). The DID model is the generalized DID with group fixed effect and time fixed effect, which reports the results before the adoption of FRS 102 (i.e., before the interaction with *FRS 102*), and the results of the impact of FRS 102 on the relationship between *Trade credit received* and debt components (i.e., after the interaction with *FRS 102*). The DID time lagged model is the lagged generalized DID with group fixed effect and time fixed effect for examining whether the effect of FRS 102 varies with time, which is a robustness check model for the DID model. The probability of the Chi2 of the Hausman test is significant at 1 % for the baseline mode, thus the fixed effect estimator is applied to address the issue of omitted variable bias (Wooldridge, 2010). The independent variables have been trimmed at (1 and 99) percentile to control for the effect of outliers and have been centered. Standard errors are displayed in parentheses. The robust standard errors clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

Results reported in Table 5.8 show that *Short-term debt* does not provide significant evidence

in neither the baseline model nor the DID model, while *Long-term debt* in the baseline model

has a negative relationship with *Trade credit received*, significant at 5%. Further in the DID model, before the adoption of FRS 102, *Long-term debt* has a negative association (i.e., β = -0.1023) with the *Trade credit received* at significant level of 5%. This implies that SMEs have less reliance on trade credit from their supplier when they have access to long-term debt from banks (García-Teruel and Martínez-Solano, 2010a). The adoption of FRS 102, however, has a positive impact (β = 0.0605), significant at 10%, on the nexus of *Long-term debt* and *Trade credit received*, which suggests that this empirical relationship has weakened but remained negative (i.e., -0.1023+0.0605 = -0.0418). This denotes that the substitute relationship (negative association) between *Trade credit received* and the *Long-term debt* has been significantly altered by the adoption of FRS 102. In Table 5.4, however, we noticed that the level of *Long-term debt* has decreased after FRS 102 adoption, while *Trade credit received* has increased. This may suggest that UK SMEs have switched to FRS 102, hoping to increase the quality of their financial reporting and to smoothen the lending process and ensure easier access to long-term bank loans, since trade credit is generally regarded as more expensive. However, the adoption of FRS 102 is associated with improved financial reporting quality and reduced level of information asymmetry, which has led the banks to better assess the lending risk. The decreasing level of long-term borrowing, together with increasing financial cost, seems to suggest that SMEs were forced to rely on using trade credit to offset their restricted access to bank credit, especially long-term borrowing. This supports the findings of Danielson and Scott (2004) that when small firms face credit constraints in obtaining bank loans, they tend to increase their demand for trade credit.

Results of the control variables in Table 5.8 did not change significantly from what is reported in Table 5.6. However, the results show in the second column (i.e., after the interaction with *FRS 102*) that FRS 102 has a negative impact on the relationship between *Firm size* and *Trade*

credit received, at significant level of 10%, and thus the relationship has changed to negative.[92]

This implies that large entities receive less credit compared to small entities after the FRS 102 adoption. Further, the results in Table 5.8 also show that *Sales growth* after the interaction with *FRS 102* demonstrate a positive and significant relationship with *Trade credit received*, significant at 10%. This suggests that, after the adoption of FRS 102, suppliers place more confidence in SMEs with more growth opportunities and are willing to supply them with more credit as a result (García-Teruel and Martínez-Solano, 2010a). The results of the DID time lagged model for *Trade credit received* in Table 5.8 shows that the interaction of the lag variables with F*RS 102* provides no significant relationship. This indicates that the adoption of FRS 102 does not vary over time. Further, the covariates in the DID time lagged model are not meaningfully different from those reported in the DID model for *Trade credit received*. Our key results are robust.

5.6 Robustness checks

To verify the robustness of our results, a set of analyses have been performed. First, a concern of this study is the potential endogeneity problem associated with the relationship between bank credit and trade credit that they might be simultaneously determined (Yang, 2011a; Palacín-Sánchez, Canto-Cuevas and di-Pietro, 2018; Wang, et al., 2020). [93] Thus, concurrent equations (i.e., bi-directional model) have been applied to address the endogeneity issuesand

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[92] The coefficient of the firm size in the first column (i.e., before the interaction with FRS 102) is positive β = 0.0128, where the coefficient in the second column (i.e., after the interaction with FRS 102) is negative β = -0.0317, and thus the overall relationship after the adoption of FRS 102 is -0.0189.

[93] Endogeneity may arise from companies self-selecting to implement the accounting standards and this is considered as one of the issues associated with voluntary adoption studies, where there exist unobserved factors that have led the companies to voluntarily switch to new accounting standards (i.e., IFRS/IAS). It is also possible to cause observable changes in the constructs under investigation, rather than the application itself (De George, Li and Shivakumar, 2016). Under the difference in differences method, Bertrand, Duflo and Mullainathan (2004) point out that most of the techniques used in the previous studies to address the concern of endogeneity, particularly in the DID studies, do not ease the concern of endogeneity. Furthermore, it is problematic to detect solutions for endogeneity issue, and even if a remedial procedure is used, it will generate other biases (Larcker and Rusticus, 2010; André, Filip and Marmousez, 2014). We fully recognize that the results of this study may be subject to the issues associated with endogeneity, and, hence, caution must be taken when interpreting the results.

the possible bias associated (Palacín-Sánchez, Canto-Cuevas and di-Pietro, 2018). We use the two-way fixed effect bi-directional equations as below:

Equation (5) presents the relationship between bank credit (*Leverage*) and *Trade credit received*:

$$Leverage_{it} = \beta_0 + \beta_1 Trade\ credit\ received_{it} + \sum Control\ variables_{it} + a_i + b_t + \varepsilon_{it}$$

Equation (6) presents the relationship between bank credit (*STLEV*) and *Trade credit supplied*:

$$STLEV_{it} = \beta_0 + \beta_1 Trade\ credit\ supplied_{it} + \sum Control\ variables_{it} + a_i + b_t + \varepsilon_{it}$$

All variable measurements have been defined previously in Section 3.

Second, the endogeneity issue of contemporary causation could be an issue in the hypotheses testing. Thus, in addition to using the bi-directional equations, we also lag right-hand side covariates to alleviate the problem of inverse causation.

To facilitate comparison, the results of the baseline model (i.e., column 1) reported in Table 5.6 will be displayed in the first column in Table 5.9. The lagged baseline model in column 3 is the baseline model in column 1 but with lagged covariates. Likewise, the lagged bi-directional model in column 4 is the bi-directional model in column 2 but with lagged covariates.

The results of the baseline model in Table 5.9 (column 1) shows that *Leverage* has a negative relationship with *Trade credit received* at a 5% significance level. Intriguingly, the results of the bi-directional model in Table 5.9 (column 2) shows that *Trade credit received* demonstrates a negative relationship with bank credit, significant at 10%. This implies that both *Trade credit received* and bank credit (*Leverage*) are jointly determined, and both have a substitute relationship. The results of the bi-directional model support the argument of Wehinger (2014) that firms resort to trade credit when they have limited access to bank loans. Most of the

variables estimated under the bi-directional model and the lagged models provide no significant results. However, most of the variables reported under the lagged models in columns 3 and 4 are qualitatively similar to those reported in column 1 and 2, respectively.

Table 5.9 Bi-directional and lagged models for Trade credit received.

	Baseline model	**Bi-directional model**	**Lagged baseline model**	**Lagged bi-directional model**
	Full sample period	*Full sample period*	*Full sample period*	*Full sample period*
Leverage	-0.0264**		-0.0226	
	(0.0115)		(0.0270)	
Trade credit received		-0.3053*		0.2219
		(0.1687)		(0.4334)
Firm size	0.0167	0.0458	-0.0393	0.1084
	(0.0283)	(0.1163)	(0.0484)	(0.1266)
Financial cost	0.1355	0.7190	-0.0136	-0.1424
	(0.1316)	(0.5924)	(0.1642)	(0.6264)
Purchases	0.0469***	-0.0332	0.0247*	-0.0240
	(0.0126)	(0.0406)	(0.0148)	(0.0405)
Sales growth	-0.0012	-0.0037	-0.0016	-0.0034
	(0.0029)	(0.0038)	(0.0012)	(0.0047)
Constant	-0.0066	0.0605	0.4313	-0.4450
	(0.1956)	(0.8083)	(0.3240)	(0.8536)
R^2	0.1297	0.0976	0.0699	0.0360
F	3.6560***	3.8550***	2.0398**	2.0591**
Firms	Included	Included	Included	Included
Years	Included	Included	Included	Included
N	780	779	695	671

Notes: This Table reports the results of the relationship between bank credit (*Leverage*) and *Trade credit received*. The baseline model is the two-way fixed effect model, where the dependent variable is *Trade credit received*. The bi-directional model is the two-way fixed effect model, where the dependent variable is leverage. The lagged baseline model is the baseline model with lagged covariates. The lagged bi-directional model is the bi-directional models with lagged covariates. The covariates have been trimmed at (1 and 99) percentile to control for the effect of outliers. Standard errors are displayed in parentheses. The robust standard errors clustered by firm. The robust standard errors clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

Regarding the results on *Trade credit supplied* and *STLEV*, as reported previously in Table 5.7, the baseline model in column 1 in Table 5.10 shows that *STLEV* has a positive relationship with *Trade credit supplied* with a level of significance at 10%. Further, the results in Table

5.10 of the bi-directional model in column 2 also shows that *Trade credit supplied* has a positive relationship with *STLEV*, significant at 5%. This could suggest that the increase in the level of *Trade credit supplied* could improve SME's access to short-term bank financing. This implies that short-term bank financing and *Trade credit supplied* are also jointly determined. This confirms the intermediary role played by SMEs, where SMEs tend to grant credit to their customers when they have more access to the short-term bank financing.

The results of the control variables in the bi-directional model in Table 5.10 in column 2 provide no significant evidence for the relationship with *STLEV*. However, *Cashflow* has a negative relationship with *STLEV* at a significant level of 5%. This is in line with argument of Petersen and Rajan (1997) who show that companies with more internal cash have less reliance on financing from their suppliers. *Turn* shows also a negative and significant relationship with *STLEV* at the 1% level. This would suggest that highly levered firms suffer from investment distortions that may affect the quality of their product (Kini, Shenoy and Subramaniam, 2014). The lagged baseline model in column 3 in Table 5.10 is the baseline model in column 1 but with lagged covariates. Similarly, the lagged bi-directional model in column 4 is the bi-directional model in column 2 but with lagged covariates. The results of the lagged baseline model in Table 5.10 also shows that most of the control variables demonstrate no significant relation with *Trade credit supplied*; however, *Cashflow* provides a negative and significant relationship with Trade credit supplied, at 5% level, which is inconsistent with the results reported in the baseline model, which is due to the lag variable effect. The results of the control variables in the lagged bi-directional model in column 4 show no significant relationship with *STLEV*. Nevertheless, *Turn* provides a negative and significant relationship with *STLEV* at 5%, which is consistent with the result reported in the bi-directional model column 2.

Table 5.10 Bi-directional and lagged models for *Trade credit supplied*.

	Baseline model	**Bi-directional model**	**Lagged baseline model**	**Lagged bi-directional model**
	Full sample period	*Full sample period*	*Full sample period*	*Full sample period*
STLEV	0.0254*		0.0129	
	(0.0141)		(0.0120)	
Trade credit supplied		0.5468**		-0.0130
		(0.2542)		(0.3319)
Firm size	0.0631***	-0.0531	-0.0324	0.0476
	(0.0213)	(0.1041)	(0.0245)	(0.1317)
Firm age	0.0439	-0.1460	0.0673	-0.1660
	(0.0450)	(0.1033)	(0.0485)	(0.1587)
Financial cost	-0.1478	0.3958	-0.0047	1.1487
	(0.1037)	(0.6455)	(0.1073)	(0.9350)
Cashflow	0.1332***	-0.1899**	-0.0204**	-0.0847
	(0.0352)	(0.0790)	(0.0097)	(0.1418)
Turn	0.0045*	-0.0176***	0.0020	-0.0121*
	(0.0027)	(0.0051)	(0.0026)	(0.0070)
Sales growth	0.0001	-0.0021	-0.0005	-0.0005
	(0.0004)	(0.0022)	(0.0004)	(0.0013)
Constant	-0.3659**	0.6678	0.3008*	0.0077
	(0.1619)	(0.7403)	(0.1722)	(0.9550)
R2	0.2633	0.0445	0.0514	0.0291
F	3.7239***	2.9167***	2.0273**	1.4814
Firms	Included	Included	Included	Included
Years	Included	Included	Included	Included
N	924	924	787	779

Notes: This Table reports the results of the relationship between short-term bank credit (*STLEV*) and *Trade credit supplied*. The baseline model is the two-way fixed effect model, where the dependent variable is *Trade credit supplied*. The bi-directional model is the two-way fixed effect model, where the dependent variable is short-term bank credit. The lagged baseline model is the baseline model with lagged covariates. The lagged bi-directional model is the bi-directional models with lagged covariates. Standard errors are displayed in parentheses. *Firm size, financial cost, and sales growth* have been trimmed at (1 and 99) percentile to control for the effect of outliers. The robust standard errors clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

Third, although FRS 102 is largely based on the IFRS for SMEs (FRC 102, 2015), which was launched in 2009 (Jermakowicz and Epstein, 2010), the initial project of FRS 102 was launched in 2012 (FRED, 2012, Part II), and since the adoption of FRS 102 by UK SMEs included in the study sample was not simultaneous, the baseline model and the generalized DID models for both trade credit granted and received have been estimated again for the period extending

from 2012 to 2019. The non-tabulated results are qualitatively similar to those reported under the period 2009-2019.

5.7 Conclusion

To contribute to a better understanding of the consequences of the adoption of the FRS 102, which is based on the IFRS for SMEs and applicable in the UK and the Republic of Ireland, and due to the importance of SMEs in the European Union (EU) economic sector in general and in the UK in particular, this study sets out to examine the impact of the FRS 102 on the relationship between trade credit and banks financing for SMEs in the UK. The unbalanced panel data of 248 SMEs have been examined during the period from 2009 to 2019. A total of 2,314 annual reports have been collected manually, depending on the data availability in each year, for the study sample to investigate the year of adoption of the FRS 102.

Our main findings indicate that the moderating effect of adopting FRS102 on SME financing decisions in relation to trade and bank credits can vary depending on the role that SMEs play, i.e., whether they are the receivers or the supplier of trade credits. As receivers, the availability of financial resources from banks substitutes for trade credit received, which implies that SMEs lower their credit levels from suppliers when they have access to bank financing (García-Teruel and Martínez-Solano, 2010a). UK SMEs would use bank finance to substitute trade credit received from suppliers before the inception of FRS 102, whereas we document an increased reliance on the trade credit received because of restricted access to long-term bank loans after the adoption of FRS 102. Given that we observe a steady decline in the level of long-term debt, and an increase in trade credit received over the sample years. We suspect that the enhanced quality of financial information disclosure associated with the adoption of FRS 102 has facilitate bank monitoring. Suggesting that such information might be more likely to trigger debt covenants and thus attract more intense monitoring. Hence, firms might switch to trade credit after FRS 102 adoption.

As a supplier of trade credit, UK SMEs has played the role of financial intermediaries by obtaining short-term loans from banks to finance their sales and subsequently granting credit to their clients; however, the issuance of FRS 102 does not alter the decision of SMEs to grant credit to customers. This suggests that neither the SMEs as a supplier of trade credit nor customers as beneficiaries of trade credit have been affected by the decision to adopt FRS 102.

Our results are robust to various model specifications (e.g., generalized DID time lagged model, generalized bi-directional with two-way fixed effect models, lagged regression models, DID model under the period from 2012-2019).

Our results could provide valuable insights for standards setters on the benefits and costs of FRS 102 adoption from the perspective of SMEs. Further, the study could help to inform regulators and managers on the lending and borrowing relationships for SMEs, and how the managers' decisions would change following the adoption of FRS 102, especially as FRS 102 comes with new disclosure requirements for small entities which brought significant changes to the financial instruments. Future research could focus on the reasons behind the decline of banks' credit, and explicitly assess how the level of information asymmetry has changed following the adoption of FRS 102.

Chapter 6 Conclusion

The main goal of this research is to examine the determinants and consequences of FRS 102 adoption of the UK SMEs. Three individual studies were undertaken to accomplish the study purpose. The first empirical paper (Chapter 3) focuses on the determinants, while the second (Chapter 4) and third (Chapter 5) empirical paper focuses on the consequences of the adoption of FRS 102. Chapter 3 examines the incentives for SMEs to adopt FRS 102. Chapter 4 examines the impact of FRS 102 on the financial reporting quality. It further examines the relationship between earnings management and leverage, and the moderating impact of FRS 102 adoption on this relationship. Chapter 5 examines the relationship between trade credit and bank credit, and the moderating impact of the FRS 102 adoption on this relationship. The summary of the key findings of these papers is presented in Section 6.1. The overall conclusion and research implications are summarized in Section 6.2. The limitations to this study and room for future research will be discussed in Section 6.3.

6.1 Summary of the Key Findings by Individual Papers

Paper 1 (Chapter 3): 'To be or not to be' –Adoption of FRS 102 by UK SMEs

The main goal of this paper is to examine the factors driving the sample SMEs towards adopting FRS 102. The study shows that SMEs with a higher expected future growth are more likely to adopt the FRS 102 as it acts as an indicator for the high quality of their reports, and thus promotes the process of engaging in contracts with external bodies. Further, the study shows that SMEs with audited accounts are more likely to adopt FRS 102, indicating that SMEs are more likely to ensure that their financial reports are of a high quality in order to increase the chance of accessing external funds. Also, the results show that industrial SMEs are more likely to adopt FRS 102. This implies that SMEs are more inclined to apply FRS 102 as a means to increase the financial reporting transparency by disclosing more information, as the industrial

sector is more susceptible to competition. Interestingly, the results show the factor Leverage provides a significant and negative association with the adoption of FRS 102. This suggests that SMEs rely on debt financing and are less prone to disclosing information to the public as they tend to share significantly more private information with their creditors, and that SMEs' creditors are more likely to establish a long-term lending relationship to acquire soft and private information and thus smooth over the debt contract procedures in order to reduce their reliance on publicly available financial reports.

To contribute to a better understanding of the negative relationship between leverage and the adoption of FRS 102, the researcher decomposed leverage into both long- and short-term liabilities. The results show that both dimensions have a negative association with FRS 102 adoption; however, the long-term liabilities provide significant evidence, while the short-term liabilities did not. This indicates that long-term liabilities are more dominant for the negative relationship and is because the long-term liabilities focus mainly on the timeframe for repayment and the interest to be paid. Thus, the reluctance of firms with a high level of leverage to switch to FRS 102 can be justified with the existence of private channels with creditors, and since long-term liabilities is the main reason for the negative relationship, this indicates the availability of information asymmetry under the old UK GAAP and that the application of FRS 102, which requires more disclosures, could lead banks to reveal the true level of risk related to loans. Thus, banks may tighten their lending criteria and adjust their interest rates upwards.

Since the adoption of FRS 102 was not simultaneous, i.e., some of SMEs adopted in 2015, while others adopted in 2016 and 2017, the researcher took the opportunity to conduct the analysis for SMEs adopting 2015, 2016, and 2017 to further understand the relationship between leverage and FRS 102 adoption. The results show that SMEs adopted in 2015 provide no significant evidence for the relationship with FRS 102, implying that those who adopted earlier are not responsible for the negative relationship. However, SMEs adopted in 2016 and

2017 show a negative and significant evidence for the relationship with FRS 102. This indicates that those adopted who later are responsible for the negative relationship. This could suggest that the significant changes brought about by FRS 102, such as an increase in disclosure requirements and changes in the measurement and evaluation of financial instruments (FRC FRS 102, 2015, 2016, 2017, 2018), had a clear impact on SMEs with a high level of leverage such as adopters in 2016 and 2017, and thus SMEs with a high level of long term-debt were more likely to stay with the old UK GAAP as long as possible. This in turn suggests that there is a level of information asymmetry under the old UK GAAP and that it is higher than when under the FRS 102.

Furthermore, the researcher has introduced an interaction between factors that could be highly correlated with leverage such as firm growth, audit, and industry. The results show the interaction between Leverage and industry provides no significant evidence. In addition, the interaction between Audit and Leverage provides no significant results. However, the interaction between Leverage and Firm growth shows a negative and significant evident. This indicates that Leverage is still the more dominant factor even if SMEs achieved a high level of growth. This could validate our previous suggestion that SMEs with a high level of leverage could have already established their private communication channel with the creditors.

Paper 2 (Chapter 4): Does FRS 102 Matter? Evidence from UK SMEs

This study examines the consequences of FRS 102 adoption by the UK SMEs included in the research sample. In particular, examining the impact of FRS 102 on the financial reporting quality proxies (i.e., earnings management, timely loss recognition, and income smoothing). Further, the paper examines the relationship between earnings management and leverage. It also examines the moderating impact of FRS 102 on the relationship between earnings management and leverage. The results show that FRS 102 adoption contributes to increasing the quality of the financial reporting. To illustrate, the study shows that both earnings

management and income smoothing decreased, while timely loss recognition increased. This shows that the objective for which the standards were established, which is to increase the quality of the financial statements of entities such as SMEs (FRC FRS 102, 2015), has been observed on the UK SMEs included in the study sample. The result of the study also shows that leverage has a positive relationship with earnings management. This indicates that the UK SMEs included in the study sample that are characterized with high leverage are more likely to manage their earnings to avoid the debt-covenant violation. Interestingly, the results also show that the adoption of FRS 102 has decreased this relationship. This is consistent with Jensen's (1986) control hypothesis which specifies that when companies obtain debt, their business will be monitored by market, analysts and investment bankers. This suggests that FRS 102 has helped to enhance control within the firm, and thus to mitigate the opportunistic behavior of managers. However, the positive relationship between leverage and earnings management remained positive. This implies that SMEs still practice earnings management in order to obtain and preserve their debts to finance their projects, while FRS 102 facilitated more intense monitoring from creditors.

Paper 3 (Chapter 5): Trade Credit versus Bank Credit: Evidence from SMEs' Adoption of FRS102

This study examines the relationship between trade credit (i.e., received and supplied) and bank credit for the UK SMEs included in the study sample. Further, it examines the moderating impact of FRS 102 on this relationship. The results of the study show that UK SMEs use bank financing as substitute for trade credit received. This suggest that SMEs lower their credit levels from suppliers when they have access to bank financing. However, the adoption of FRS 102 has weakened the relationship between trade credit received and bank financing. Further, the study shows that level of bank financing obtained by the sample SMEs has decreased, while

the level of trade credit received has increased after the adoption of FRS 102.[94] This suggests that the quality of financial statements associated with the adoption of FRS 102 might enhance the quality of financial information disclosure and level of information asymmetry alleviated, and thus, creditors such as banks would be able to better assess the financial risk associated with lending to the UK SMEs. Hence, FRS 102 attracts more intense monitoring.

Further, the study shows that trade credit supplied has a positive relationship with short-term bank financing, suggesting that SMEs play the role of financial intermediaries by obtaining short-term loans from banks to finance their sales activities by extending credit to their customers. However, FRS 102 does not affect SMEs' decision of granting credit to their customers, and thus customers, as recipients of trade credit, would be indifferent as to whether or not the research sample of SMEs adopted FRS 102.

6.2 Overall Conclusion and Implications

This research examines the determinants and consequences of adopting the FRS 102 standard. Three papers were conducted, as mentioned, to achieve the purpose of the study, and the following conclusion was reached.

Within the context of the non-compulsory application witnessed by the study sample SMEs during the study period, it was found that there are several factors (in the first study) that drive SMEs to implement, such as firm growth, audited accounts, and industry, but the leverage factor showed an intriguing role, that is, SMEs with high leverage were less inclined to apply FRS 102; hence, the focus was on leverage in the second and third paper.

In the first paper, it was suggested that SMEs with a higher level of long-term debt have already established their private communication channel with the creditors, and their financial reports

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[94] The bi-directional model has been applied for the relationship between bank financing and trade credit received, and the results provide a negative and significant evidence, implying that SMEs resort to trade credit when they have limited access to bank loans.

are less relied upon by the creditors, and the adoption of FRS 102 could reveal the financial leverage risk that might exist prior to the adoption. To contribute to a better understanding, the researcher, in the second paper, focused on the moderating impact of FRS 102 adoption on the relationship between earnings management and leverage. The study shows that, prior to FRS 102 adoption, SMEs' managers seek to manipulate earnings to avoid the prospect of violating debt covenants, while this relationship has weakened after the adoption of FRS 102. Thus, the adoption of FRS 102 has facilitated more intense monitoring from creditors and the financial reporting quality associated with the adoption of FRS 102 could reveal information asymmetry that existed before the adoption of FRS 102 regarding the risk of financial leverage. Therefore, the researcher wanted to verify this by studying the relationship between the sources of financing for SMEs (i.e., bank financing and trade credit), and the impact of FRS 102 on the relationship between these sources. The results show that bank financing (i.e., leverage) substitutes for trade credit, while FRS 102 adoption decreased this relationship. Further, after the adoption of FRS 102, the researcher found evidence that interest expenses increased, and SMEs are less able to obtain financial leverage from banks which caused them to shift to trade credit in order to raise external financing. This indicates that FRS 102 adoption increased bank monitoring and thus could reveal the level of information asymmetry that existed before the adoption. This, in turn, enhanced the researcher's understanding of why SMEs with a high level of leverage are less likely to switch to FRS 102, as was identified in the first paper.

In addition, the third paper shows that SMEs play the role of financial intermediaries by obtaining short-term loans from banks to finance their sales activities by extending credit to their customers; however, FRS 102 does not affect SMEs' decision of granting credit to their customers, and thus customers, as recipients of trade credit, would be indifferent as to whether or not the research sample SMEs adopted FRS 102.

Overall, the first paper shows that SMEs with high level of leverage are less likely to adopt FRS 102, while the second paper provides evidence that FRS 102 increases financial reporting quality and this quality also has been observed in the relationship between earnings management and leverage by weakening the relationship between them. Thus, FRS 102 increased bank monitoring. Hence, the researcher suspects that FRS 102 could reveal information asymmetry that existed before the adoption of FRS 102 regarding the risk of financial leverage. This was further confirmed in the third paper where it was found that SMEs are less able to obtain financial leverage from banks after FRS 102 adoption, which caused them to shift to trade credit in order to raise external financing.

Several policy implications derived from this research will be of interest to the FRC, IASB, banks, SMEs' managers, investors, creditors and shareholders. First, the findings of the first paper could provide further evidence to standard-setters and regulators at the FRC and IASB about the incentives for UK SMEs towards adopting FRS 102, and what factors (e.g. leverage) dampen SMEs' willingness to implement FRS 102. This, in turn, is expected to increase the interest of both FRC and IASB in shedding light on changes related to financial instruments to ensure an effective contracting environment for SMEs in the UK. Second, the results of the second paper can provide further evidence for banks and SMEs alike. With regard to banks, this study showed that there is potential for a high level of information asymmetry for SMEs with a high level of leverage. Accordingly, it is possible for banks, considering the increased level of disclosures under FRS 102, to assess the level of risks associated with granting loans and review their policies in the lending process. As for SMEs, they basically need to revise their policies on borrowing loans from banks after adopting FRS 102 so that they do not risk breaching debt covenants or are not exposed to strict lending standards from creditors such as banks. Third, the findings of the third paper could provide further evidence to investors on how the adoption of FRS 102 increases the quality of the SMEs' financial statements, which in turn

could affect their decision making. Furthermore, the third study is expected to provide further evidence for creditors and shareholders on how compliance with FRS 102 affects the debt contracting environments of private/SMEs in the UK, in particular, that these standards contain substantial differences relating to financial instruments compared to other standards such IFRS and old UK GAAP (FRC FRS 102, 2015; PWC, 2013), which in turn affects the methods of valuing assets and liabilities, and consequently affects the financial position reporting. Overall, the results of this research give an indication of the costs and benefits of adopting FRS 102 by SMEs in the UK, and how the significant changes brought about by these standards in relation to financial instruments have affected the contractual environments of those firms.

6.3 Research Limitation and Future Scope

This research does have some limitations, but this does not detract from the importance of its findings, and it is probable that future studies would overcome them in whole or in part. In terms of research design limitations, the use of the top 300 SMEs could raise the issue of selection bias, and therefore it may not be possible to generalize the results of the study to all SMEs in the UK. However, the researcher nonetheless acknowledges that the implicit selection bias generated by this specific sampling technique could have implications on our results. To illustrate, it is likely that the results will not be generalizable to the population, but it is worth indicating that FRS 102 brought about many modifications such as changes related to the financial instruments (see FRC FRS 102, 2015) and that, if the modifications are observable on the best SMEs, they too can be recognized in SMEs in general. To illustrate, if the determinants and consequences turn out to be crucial for the top SMEs covered in the research sample, it should also matter for SMEs in general. In both ways, care must be taken when interpreting the results. Thus, it is highly recommended for future studies to consider another approach in selecting the sample of SMEs in the UK and studying FRS 102 adoption in order to compare it with our results.

Prior IFRS for studies that examine SMEs have mostly used questionnaires and interviews to gauge the qualitative effect of IFRS for SMEs adoption. The current study, on the other hand, refers directly to the financial statements of SMEs to measure the effect of FRS 102 adoption, thus bringing a new perspective to the literature with the usage of a new data source (IFRS for SMEs based financial statements). Therefore, the researcher had to rely on previous studies related to private firms to choose theories and variable measurements, considering that SMEs are a special type of private firm. Therefore, the results of this research may be similar or different from future studies that may apply different theories and other variable measurements that could be conducted within the context of SMEs. For instance, future studies may rely on other theories such as the public interest theory of regulation and interest group theory to consider the consequences of regulating the new UK GAAP and to help build a vital conceptual framework to understand why the FRC have regulated FRS 102 and how regulators reacted to market forces (Bushman and Landsman 2010; Kothari, Ramanna and Skinner, 2010; Leuz 2010; Kaya and Koch, 2015). In addition, this research focused on the model of DeFond and Park (2001) to measure the abnormal working capital; this could be considered a study limitation, particularly in paper two. Thus, future studies could use different research design and employing different measurement of earnings management such as models developed to measure the abnormal accruals "Jones-models" (Jones, 1991; Dechow, Sloan and Sweeney, 1995; Kothari, Leone and Wasley, 2005) to see if these research findings will be consistent with the findings of future studies.

Moreover, Bertrand, Duflo and Mullainathan (2004) point out that there are many techniques used in the previous studies to address the concern of endogeneity such as Heckman 2-stage model. However, under the difference-in-differences method, particularly in the DID studies, these techniques do not actually ease this concern. Furthermore, it is problematic to detect solutions for the endogeneity issue, and even if a remedial procedure is used, it will

generate other biases (Larcker and Rusticus, 2010; André, Filip and Marmousez, 2014). This, in turn, could be considered as a study limitation and I highly recommend future studies to apply the Heckman 2-stage model to see if the endogeneity issue could be eased in this regard. Thus, I fully recognize that the results of this research may be subject to the issues associated with endogeneity, and, hence, caution must be exercised when interpreting the results.

Further, since this research finds that the level of leverage after the adoption has decreased, and the researcher suspects that the adoption of FRS 102 has revealed the level of information asymmetry under the old UK GAAP. Thus, future research could focus on the reasons behind the decline of banks' credit, and explicitly assess how the level of information asymmetry has changed following the adoption of FRS 102.

Moreover, future studies could use qualitative methods via conducting several interviews with banks in the UK to provide this research – with anecdotal evidence – to better understand the contractual environments related to debt and loans for SMEs and the reasons behind the decline in the level of leverage after the adoption of FRS 102.

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Appendix A

Appendix A shows the analysis related to the empirical paper 1 (Chapter 3) as below:

- **Robustness check for models 1 and 2 in Table 3.4:**

 As a robustness check, models 1 and 2 which are available in Table 3.4 in paper 1 are estimated

again after considering the sector effect as below:

Table 1: Discrete Hazard Models with Sector Effect

Variables	Pred.	Model (1)	Model (2)
		2009-2018	2012-2018
Leverage	(?)	-0.2619**	-0.2683**
		(0.1221)	(0.1235)
Firm growth	(+)	1.8850***	1.9393***
		(0.7011)	(0.6671)
Foreign Ownership	(+)	0.1770	0.1395
		(0.3576)	(0.3282)
Firm age	(-)	-0.0016	-0.0005
		(0.0098)	(0.0094)
Audit	(+)	2.6289***	2.7140***
		(0.7729)	(0.7975)
Size	(+)	1.0064*	0.8622
		(0.5711)	(0.5592)
Constant		-14.9331***	-12.8752***
		(4.3048)	(4.3140)
TIME DUMMIES		Yes	Yes
Sector dummies		Yes	Yes
Pseudo-R^2		0.5631	0.4921
Prob $>$ chi^2		0.000	0.000
N		958	606

Notes: This Table estimates the discrete hazard proportional odds models for the study determinants for the whole sample after considering the effect of sectors (i.e., industry dummies). Model (1) is the baseline model for the period ranges from 2009-2018. Model (2) is the baseline model for the period ranges from 2012-2018. The results of both models are qualitatively similar. All observations after experiencing the event have been left out from the analysis. The constant term was conducted based on piecewise constant methods to take account of the constraint that there are some sub-intervals within which there were no events. The robust standard errors clustered by firm. The z-statistics are displayed in parentheses. Stars indicate statistical significance: *p < .1, **p < .05, ***p < .01.

- **Robustness check for models 1 and 2 in Table 3.4:**

As a robustness check, the discrete hazard model for models 3 and 4 have been estimated

again after considering the sector effect as below:

Table 2: Discrete Hazard Models with Sector Effect and Leverage Components.

Variables	Model (3)	Model (4)
	2009-2018	2012-2018
Short-term liabilities	-0.4382	-0.4500
	(0.3139)	(0.3200)
Long-term liabilities	-0.2447**	-0.2512**
	(0.115)	(0.1160)
Firm growth	1.7390***	1.8081***
	(0.6666)	(0.6330)
Foreign Ownership	0.1519	0.1141
	(0.3454)	(0.3179)
Firm age	-0.0033	-0.0022
	(0.0101)	(0.0098)
Audit	2.8068***	2.9073***
	(0.796)	(0.8319)
Firm size	0.6977	0.5484
	(0.6093)	(0.5997)
Constant	-12.7739***	-10.6682**
	(4.4822)	(4.5048)
TIME DUMMIES	YES	YES
Pseudo R^2	0.5569	0.4844
Prob $>$ chi^2	0.000	0.000
N	961	607

Notes: This Table estimates the discrete hazard proportional odds models for the study determinants for the whole sample after considering the effect of sectors (i.e., industry dummies) and after decomposing leverage into both long-term and short-term liabilities. Model (3) is the baseline model for the period ranges from 2009-2018. Model (4) is the baseline model for the period ranges from 2012-2018. The results of both models are qualitatively similar. All observations after experiencing the event have been left out from the analysis. The constant term was conducted based on piecewise constant methods to take account of the constraint that there are some sub-intervals within which there were no events. The robust standard errors clustered by firm. The z-statistics are displayed in parentheses. Stars indicate statistical significance: *p < .1, **p < .05, ***p < .01.

- **Robustness check for models in Table 3.7:**

As a robustness check, the discrete hazard model has been estimated for the sub-sample group after using one year lag for the covariates.

Table 3: The Discrete Hazard Models for the Sub-Sample Group with One-Year Lag

Variables	Pred.	Adopted in 2015	Adopted in 2016	Adopted in 2017
		(2009-2015)	(2009-2016)	(2009-2017)
Leverage	(?)	-1.1220	-0.1409	-0.1682**
		(0.7307)	(0.1525)	(0.0715)
Firm growth	(+)	0.6105	0.5635	1.0303**
		(1.3320)	(0.6619)	(0.4975)
Foreign Ownership	(+)	0.8786	0.3537	0.4794*
		(0.5464)	(0.3024)	(0.2472)
Firm age	(-)	0.0030	-0.0089	-0.0037
		(0.0115)	(0.0069)	(0.0077)
Audit	(+)	2.1481**	1.5805***	1.1356**
		(0.9242)	(0.5048)	(0.5562)
Industry	(+)	0.1101	0.3518	0.3881
		(0.4172)	(0.2199)	(0.2420)
Firm size	(+)	-0.2125	0.3258	0.5742
		(0.4720)	(0.3016)	(0.3524)
Constant		-5.7124*	-8.1478***	-7.8463***
		(3.2527)	(1.9180)	(2.3146)
TIME DUMMIES		YES	YES	YES
Pseudo R^2		0.4529	0.4930	0.4298
Prob > chi^2		0.000	0.000	0.000
N		730	820	839

Note: The above Table estimates the discrete hazard proportional odds models for the study determinants for SMEs that adopted the FRS 102 in 2015, 2016, and 2017 after using one-year lag. All firm-year observations for group one (i.e., adopted in 2015) after the adoption year (2015) have been deleted and the same thing for the second group (i.e. adopted in 2016) and group three (i.e. adopted in 2017), while all firm-year observations before the adoption year have been used in each group for the purpose of sample controlling. All observations after experiencing the event have been left out from the analysis. The constant was conducted based on piecewise constant methods to take account of the constraint that there are some sub-intervals within which there were no events. The robust standard errors clustered by firm. The z-statistics are displayed in parentheses. Stars indicate statistical significance: *p < .1, **p < .05, ***p < .01.

- **Robustness check for models in Table 3.7:**

As a robustness check, the discrete hazard model has been estimated for the sub-sample group

after decomposing leverage into both current liabilities and long-term liabilities.

Table 4: The Discrete Hazard Models for the Sub-Sample Group with Leverage Components.

Variables	Pred.	Adopted in 2015	Adopted in 2016	Adopted in 2017
		(2009-2015)	(2009-2016)	(2009-2017)
Short-term liabilities	(?)	-1.0891	-0.2066	-0.3906
		(0.8321)	(0.1587)	(0.2969)
Long-term liabilities	(?)	-1.7791	-0.2635	-0.1577**
		(1.3761)	(0.1744)	(0.0691)
Firm growth	(+)	1.4431**	0.7413	1.6208***
		(0.5848)	(0.4956)	(0.5477)
Foreign Ownership	(+)	0.2804	0.2970	0.4655*
		(0.3777)	(0.2965)	(0.2597)
Firm age	(-)	0.0067	-0.0063	-0.0001
		(0.0071)	(0.0064)	(0.0077)
Audit	(+)	2.6923***	1.8830***	2.2644***
		(0.7514)	(0.5236)	(0.6252)
Industry	(+)	0.0487	0.3701*	0.4122
		(0.3059)	(0.2154)	(0.2594)
Firm size	(+)	-0.0274	-0.0035	0.5469
		(0.5810)	(0.3324)	(0.4577)
Constant		-8.3593**	-6.4296***	-9.1104***
		(3.8328)	(2.1421)	(3.1054)
TIME DUMMIES		YES	YES	YES
Pseudo R^2		0.2518	0.5184	0.4669
Prob > chi^2		0.000	0.000	0.000
N		860	950	961

Note: The above Table estimates the discrete hazard proportional odds models for the study determinants for SMEs that adopted the FRS 102 in 2015, 2016, and 2017 after decomposing leverage into current liabilities and long-term liabilities. All firm-year observations for group one (i.e., adopted in 2015) after the adoption year (2015) have been deleted and the same thing for the second group (i.e. adopted in 2016) and group three (i.e. adopted in 2017), while all firm-year observations before the adoption year have been used in each group for the purpose of sample controlling. All observations after experiencing the event have been left out from the analysis. The constant was conducted based on piecewise constant methods to take account of the constraint that there are some sub-intervals within which there were no events. The robust standard errors clustered by firm. The z-statistics are displayed in parentheses. Stars indicate statistical significance: *p < .1, **p < .05, ***p < .01.

- **Robustness check for models in Table 3.7:**

As a robustness check, the discrete hazard model has been estimated for the sub-sample group after using total debt as another proxy of leverage which is the sum between long-term debt and short-term loans & overdrafts.

Table 5: The Discrete Hazard Models for the Sub-Sample Group-Total Debt

Variables	Pred.	Adopted in 2015	Adopted in 2016	Adopted in 2017
		(2009-2015)	(2009-2016)	(2009-2017)
Total debt	(?)	-0.2517	-0.0974	-0.1021
		(0.4321)	(0.2327)	(0.1247)
Firm growth	(+)	1.7321***	2.2144***	2.7764***
		(0.6568)	(0.7098)	(0.8211)
Foreign Ownership	(+)	0.7547*	0.5336	0.5199
		(0.3946)	(0.4148)	(0.3187)
Firm age	(-)	0.0127	-0.0153	0.0009
		(0.0134)	(0.0102)	(0.0129)
Audit	(+)	1.2170	2.3784**	2.0512
		(0.8170)	(0.9396)	(1.9448)
Industry	(+)	-0.2940	0.4421	0.2272
		(0.4049)	(0.2972)	(0.3360)
Firm size	(+)	-0.2031	-0.1519	0.5136
		(0.5081)	(0.3785)	(0.3989)
Constant		-5.9757*	-5.9155**	-8.8136***
		(3.4288)	(2.4972)	(3.2214)
TIME DUMMIES		YES	YES	YES
Pseudo R^2		0.2325	0.5364	0.4636
Prob > chi^2		0.000	0.000	0.000
N		532	588	593

Note: The above Table estimates the discrete hazard proportional odds models for the study determinants for SMEs that adopted the FRS 102 in 2015, 2016, and 2017 after using total debt which is the sum between long-term debt and current loans and overdrafts. All firm-year observations for group one (i.e., adopted in 2015) after the adoption year (2015) have been deleted and the same thing for the second group (i.e., adopted in 2016) and group three (i.e., adopted in 2017), while all firm-year observations before the adoption year have been used in each group for the purpose of sample controlling. All observations after experiencing the event have been left out from the analysis. The constant was conducted based on piecewise constant methods to take account of the constraint that there are some sub-intervals within which there were no events. The robust standard errors clustered by firm. The z-statistics are displayed in parentheses. Stars indicate statistical significance: *p < .1, **p < .05, ***p < .01.

- **Robustness check for models 1 and 2 in Table 3.4:**

As a robustness check, the frailty models (i.e., random effect models for the baseline Discrete

hazard model) have been estimated for models 1 and 2 which are available in Table 3.4 in paper

1 as below:

Table 6: Frailty Models

Variables	Model (1) 2009-2018	Model (2) 2012-2018
	Random-effect model	Random-effect model
leverage	-0.1669	-0.1696
	(0.1552)	(0.1560)
Firm growth	1.5878***	1.6163***
	(0.5395)	(0.5409)
Foreign Ownership	0.3844	0.3764
	(0.3663)	(0.3654)
Firm age	-0.0035	-0.0027
	(0.0091)	(0.0090)
Audit	2.2346***	2.2826***
	(0.6434)	(0.6457)
Industry	0.5348*	0.5249
	(0.3238)	(0.3249)
Firm size	0.4189	0.3510
	(0.4189)	(0.4243)
Constant	-10.1225***	-8.5196***
	(2.8094)	(2.8663)
TIME DUMMIES	Yes	Yes
Wald chi^2	142.13	117.59
Prob > chi^2	0.000	0.000
N	958	606

This Table estimates the discrete hazard proportional odds models for the study determinants for the whole sample. Model (1) is the frailty model (i.e., random effect model) for the period ranges from 2009-2018. Model (2) is the frailty model (i.e., random effect model) for model (1) for the period ranges from 2009-2018.The frailty models (i.e., random effect models) have been adopted to control for omitted variables and for robustness purposes. The constant term was conducted based on piecewise constant methods to take account of the constraint that there are some sub-intervals within which there were no events. The robust standard errors clustered by firm. The z-statistics are displayed in parentheses. Stars indicate statistical significance: *p < .1, **p < .05, ***p < .01.

- **Robustness check for models 1 and 2 in Table 3.4:**

As robustness check, the hazard regression estimated again for Models 1 and 2 by using the

Total debt as another proxy of Leverage, where Total debt is the sum between Long-term debt

and short-term loans & overdrafts.

Table 7: The Discrete Hazard models-Total Debt

Variables	Model (1)	Model (2)
	2009-2018	2012-2018
Total debt	-0.1414	-0.1479
	(0.1308)	(0.1307)
Firm growth	2.2780***	2.2784***
	(0.8196)	(0.8045)
Foreign Ownership	0.4951	0.4688
	(0.3581)	(0.3366)
Firm age	-0.0114	-0.0092
	(0.0144)	(0.0133)
Audit	2.0959	2.1303
	(1.8672)	(1.8826)
Industry	0.3342	0.3028
	(0.3758)	(0.3584)
Firm size	0.2910	0.1962
	(0.4201)	(0.4112)
Constant	-8.6406***	-6.8991**
	(3.2138)	(3.2285)
TIME DUMMIES	Yes	Yes
Pseudo-R^2	0.5260	0.4523
Prob > chi^2	0.000	0.000
N	593	382

This Table estimates the discrete hazard proportional odds models for the study determinants for the whole sample. Model (1) is the Discrete hazard model for the period ranges from 2009-2018. Model (2) is the Discrete hazard model for model for the period ranges from 2009-2018. The constant term was conducted based on piecewise constant methods to take account of the constraint that there are some sub-intervals within which there were no events. The robust standard errors clustered by firm. The z-statistics are displayed in parentheses. Stars indicate statistical significance: *$p < .1$, **$p < .05$, ***$p < .01$.

Robustness check for models 3 and 4 in Table 3.5:

As a robustness check, the discrete hazard model after decomposing total debt into the long-term debt and short-term debt have been estimated as below:

Table 8: Discrete Hazard Model-Total Debt Components

Variables	Model (1)	Model (2)	Model (3)	Model (4)
	2009-2018	2009-2018	2012-2018	2012-2018
Long-term debt	-0.2844**	____	-0.2951**	____
	(0.1446)	____	(0.1377)	____
Short-term debt	____	0.1759	____	0.1769
	____	(0.2461)	____	(0.2463)
Firm growth	1.9537	2.3572***	1.9315	2.3602***
	(1.9432)	(0.8511)	(1.8188)	(0.8391)
Foreign Ownership	0.4785	0.5104	0.4686	0.4847
	(0.6212)	(0.3681)	(0.6180)	(0.3476)
Firm age	-0.0095	-0.0075	-0.0078	-0.0051
	(0.0229)	(0.0141)	(0.0218)	(0.0129)
Audit	1.7201	0.9015	1.7135	0.9352
	(4.3093)	(2.1280)	(4.5042)	(2.1307)
Industry	0.2679	0.3689	0.2219	0.3381
	(0.6133)	(0.3765)	(0.6050)	(0.3579)
Firm size	-0.0608	0.4997	-0.1510	0.4109
	(0.6388)	(0.4381)	(0.6348)	(0.4298)
Constant	-6.1433	-9.0444***	-4.2891	-7.3595**
	(6.1799)	(3.2572)	(6.3742)	(3.2788)
TIME DUMMIES	YES	YES	YES	YES
Pseudo R^2	0.5942	0.5237	0.5306	0.4491
Prob > chi^2	0.000	0.000	0.000	0.000
N	386	581	236	373

This Table estimates the discrete hazard proportional odds models for the study determinants for the whole sample after decomposing total debt into the long-term debt and short-term debt. The constant term was conducted based on piecewise constant methods to take account of the constraint that there are some sub-intervals within which there were no events. The robust standard errors clustered by firm. The z-statistics are displayed in parentheses. Stars indicate statistical significance: *p < .1, **p < .05, ***p < .01.

- **Robustness check for Model 1 in Table 3.4.**

As a robustness check, the logistic regression for model 1 in Table 3.4 has been conducted as below:

Table 9: The Logistic Regressions Method for the Period From 2009 to 2018.

Variables	Model (1) 2009-2018 *Random effect*	Model (2) 2009-2018 *Random effect with sector effect*	Model (3) 2009-2018 *OLS*	Model (4) 2009-2018 *OLS with sector effect*	Model (5) 2009-2018 *Marginal effect dy/dx*
Leverage	-0.3996*	-0.3499	-0.3996*	-0.3499	-0.0494*
	(0.2219)	(0.2294)	(0.2219)	(0.2294)	(0.0274)
Firm growth	0.8749***	1.3803***	0.8750***	1.3805***	0.1083***
	(0.1929)	(0.2766)	(0.1929)	(0.2766)	(0.0237)
Foreign ownership	0.0570	-0.2668	0.0571	-0.2669	0.0071
	(0.2098)	(0.2240)	(0.2098)	(0.2240)	(0.0260)
Firm age	0.0015	0.0027	0.0015	0.0027	0.0002
	(0.0035)	(0.0036)	(0.0035)	(0.0036)	(0.0004)
Audit	1.1076***	1.0745***	1.1076***	1.0744***	0.1371***
	(0.3290)	(0.3346)	(0.3290)	(0.3346)	(0.0409)
Industry	0.0463		0.0463		
	(0.1491)		(0.1491)		0.0057
Firm size	0.9624***	1.5543***	0.9625***	1.5546***	(0.0185)
	(0.1741)	(0.2273)	(0.1741)	(0.2273)	0.1191***
					(0.0212)
Constant	-9.2062***	-12.6130***	-9.2067***	-12.6149***	
	(1.1707)	(1.7623)	(1.1707)	(1.7623)	____
Wald chi^2	74.82***	97.38***	____	____	
Pseudo R^2	____	____	0.0700***	0.0919***	____
Sector	Not included	Included	Not included	Included	——
N	1727	1704	1727	1704	____

Note: This Table estimates the SMES determinants of the FRS 102 adoption for the period extending from 2009-2018. The probability of the Chi2 of the Hausman test is not significant for the model, thus the random effect applied. To confirm that, the fixed effect has been conducted for the logistic regression and the STATA shows no results. Furthermore, years have been included in the regressions and the STATA shows no results for the years as they are collinear with the dependent variable. Thus, random effect has been applied and years have been excluded. Across models, the mean value of VIF is lower than 10, which implies that the collinearity does not pose any genuine concern over the empirical results (Gujarati, 2009). Further, the OLS estimation has been conducted and the results are qualitatively similar. In addition, the robust standard errors clustered by firm and the results remained qualitatively similar. The marginal effect for the baseline model has been conducted. The standard errors are displayed in parentheses. Stars indicate statistical significance: *p < .1, **p < .05, ***p < .01.

- **Robustness check for Model 2 in Table 3.4.**

As a robustness check, the logistic regression for model 2 in Table 3.4 has been conducted as below:

Table 10: The Logistic Regressions Method for the Period from 2012 to 2018.

Variables	Model (1) 2012-2018 Random effect	Model (2) 2012-2018 Random effect with sector effect	Model (3) 2012-2018 OLS	Model (4) 2012-2018 OLS with sector effect	Model (5) 2009-2018 Marginal effect dy/dx
Leverage	-0.3117	-0.2804	-0.3117	-0.2804	-0.0535
	(0.2016)	(0.2208)	(0.2016)	(0.2208)	(0.0345)
Firm growth	0.7174***	1.2231***	0.7175***	1.2232***	0.1232***
	(0.1907)	(0.2944)	(0.1907)	(0.2944)	(0.0321)
Foreign Ownership	0.0770	-0.2089	0.0770	-0.2090	0.0132
	(0.2242)	(0.2408)	(0.2242)	(0.2408)	(0.0385)
Firm age	0.0023	0.0041	0.0023	0.0041	0.0004
	(0.0037)	(0.0038)	(0.0037)	(0.0038)	(0.0006)
Audit	1.2966***	1.3601***	1.2965***	1.3600***	.2226***
	(0.3324)	(0.3413)	(0.3324)	(0.3413)	(0.0566)
Industry	0.0251		0.0250		0.0043
	(0.1571)		(0.1571)		(0.0270)
Firm Size	0.6922***	1.0486***	0.6924***	1.0488***	0.1188***
	(0.1954)	(0.2422)	(0.1954)	(0.2422)	(0.0329)
Constant	-7.0541***	-9.3269***	-7.0550***	-9.3279***	___
	(1.3093)	(1.8724)	(1.3093)	(1.8724)	___
Wald Chi^2	53.37***	66.83***	___	___	___
Pseudo R^2	___	___	0.0607***	0.0773***	___
Sector	Not included	Included	Not Included	Included	___
N	1118	1103	1118	1103	___

Note: This Table estimates the SMES determinants of the FRS 102 adoption for the period extending from 2012-2018. The probability of the Chi2 of the Hausman test is not significant for the model, thus the random effect applied. To confirm that, the fixed effect has been conducted for the logistic regression and the STATA shows no results. Furthermore, years have been included in the regressions and the STATA shows no results for the years as they are collinear with the dependent variable. Thus, random effect has been applied and years have been excluded. Across models, the mean value of VIF is lower than 10, which implies that the collinearity does not pose any genuine concern over the empirical results (Gujarati, 2009). Further, the OLS estimation has been conducted and the results are qualitatively similar. In addition, the robust standard errors clustered by firm and the results remained qualitatively similar. The marginal effect for the baseline model has been conducted. The standard errors are displayed in parentheses. Stars indicate statistical significance: *p < .1, **p < .05, ***p < .01.

- Robustness check for model 1 in Table 3.4:

As robustness check, the logistic regression estimated for Models 1 by using the Total debt as another proxy of Leverage, where Total debt is the sum between Long-term debt and short-term loans & overdrafts.

Table 11: The Logistic Regression models by Using Total Debt for the Period from 2009 to 2018

Variables	Model (1) 2009-2018 Random effect	Model (2) 2009-2018 Random effect with industry effect	Model (3) 2009-2018 OLS	Model (4) 2009-2018 *OLS with industry effect*	Model (5) 2009-2018 Marginal effect dy/dx
Total debt	-0.5771*	-0.5007	-0.5771*	-0.5007	-0.0713*
	(0.3369)	(0.3390)	(0.3369)	(0.3390)	(0.0416)
Firm growth	0.9227***	1.3802***	0.9228***	1.3803***	0.1140***
	(0.1966)	(0.2755)	(0.1966)	(0.2755)	(0.0241)
Foreign ownership	0.0796	-0.2530	0.0796	-0.2530	0.0098
	(0.2092)	(0.2237)	(0.2092)	(0.2237)	(0.0258)
Firm age	0.0020	0.0031	0.0020	0.0031	0.0002
	(0.0034)	(0.0036)	(0.0034)	(0.0036)	(0.0004)
Audit	1.1222***	1.0996***	1.1222***	1.0995***	0.1386***
	(0.3272)	(0.3345)	(0.3273)	(0.3345)	(0.0406)
Industry	0.0564	____	0.0564	____	0.0070
	(0.1490)	____	(0.1490)	____	(0.0184)
Size	1.1150***	1.6699***	1.1151***	1.6702***	0.1377***
	(0.1823)	(0.2287)	(0.1823)	(0.2287)	(0.0221)
Constant	-10.4152***	-13.6549***	-10.4159***	-13.6567***	____
	(1.1913)	(1.7368)	(1.1913)	(1.7369)	____
Wald chi^2	75.66***	97.70***	____	____	____
Pseudo R^2	____	____	0.0702***	0.0925***	____
Sector	Not included	Included	Not included	Included	____
N	1731	1708	1731	1708	____

Note: This Table estimates the SMES determinants of the FRS 102 adoption for the period extending from 2009-2018 after using the total debt which is the sum between long-term debt and short-term loans & overdrafts. The probability of the Chi2 of the Hausman test is not significant for the model, thus the random effect applied. To confirm that, the fixed effect has been conducted for the logistic regression and the STATA shows no results. Furthermore, years have been included in the regressions and the STATA shows no results for the years as they are collinear with the dependent variable. Thus, random effect has been applied and years have been excluded. Across models, the mean value of VIF is lower than 10, which implies that the collinearity does not pose any genuine concern over the empirical results (Gujarati, 2009). Further, the OLS estimation has been conducted and the results are qualitatively similar. In model (2 & 4), the sector variable replaced with industry dummies, and likewise, the results remained qualitatively similar. In addition, the robust standard errors clustered by firm and the results remained qualitatively similar. The marginal effect for the baseline model has been conducted. The standard errors are displayed in parentheses. Stars indicate statistical significance: *p < .1, **p < .05, ***p < .01.

- **Robustness check for model 1 in Table 3.5:**

As a robustness check, the logistic regression for the period extends from 2009-2018 has been conducted below after decomposing leverage into long-term liabilities and short-term liabilities, and after considering the effect of sector.

Table 12: The Logistic Regression after using the Leverage Components and Sector Effect

Variables	Model (1) 2009-2018 *Random effect*	Model (2) 2009-2018 *Random effect with sector effect*	Model (3) 2009-2018 *OLS*	Model (4) 2009-2018 *OLS with sector effect*	Model (5) 2009-2018 *Marginal effect dy/dx*
Short-term liabilities	0.0179	-0.0019	0.0179	-0.0018	0.0022
	(0.1743)	(0.1811)	(0.1743)	(0.1811)	(0.0213)
Long-term liabilities	-2.8572***	-2.6775***	-2.8576***	-2.6777***	-0.3487***
	(0.6131)	(0.6387)	(0.6132)	(0.6387)	(0.0743)
Firm growth	1.0031***	1.3993***	1.0032***	1.3994***	0.1224***
	(0.2089)	(0.2831)	(0.2089)	(0.2831)	(0.0252)
Foreign ownership	-0.0849	-0.3689	-0.0849	-0.3690	-0.0104
	(0.2140)	(0.2267)	(0.2140)	(0.2267)	(0.0261)
Firm age	-0.0000	0.0010	-0.0000	0.0010	-0.00000412
	(0.0035)	(0.0036)	(0.0035)	(0.0036)	(0.0004)
Audit	0.8850***	0.8977***	0.8850***	0.8976***	0.1080***
	(0.3300)	(0.3370)	(0.3300)	(0.3370)	(0.0404)
Industry	0.0487	____	0.0487		0.0059
	(0.1502)	____	(0.1502)		(0.0183)
Size	1.5114***	1.9502***	1.5116***	1.9505***	0.1844***
	(0.2196)	(0.2517)	(0.2196)	(0.2517)	(0.0262)
Constant	-12.7003***	-15.1309***	-12.7017***	-15.1331***	___
	(1.4457)	(1.8741)	(1.4458)	(1.8741)	___
Wald chi^2	88.19***	109.28	___	___	___
Pseudo R^2	___	___	0.0860***	0.1046***	___
Sector	Not included	Included	Not included	Included	___
N	1727	1704	1727	1704	___

Note: This Table estimates the SMES determinants of the FRS 102 adoption for the period extending from 2009-2018 after decomposing leverage into short-term and long-term liabilities. The probability of the Chi2 of the Hausman test is not significant for the model, thus the random effect applied. To confirm that, the fixed effect has been conducted for the logistic regression and the STATA shows no results. Furthermore, years have been included in the regressions and the STATA shows no results for the years as they are collinear with the dependent variable. Thus, random effect has been applied and years have been excluded. Across models, the mean value of VIF is lower than 10, which implies that the collinearity does not pose any genuine concern over the empirical results (Gujarati, 2009). Further, the OLS estimation has been conducted and the results are qualitatively similar. In model (2 & 4), the sector variable replaced with industry dummies, and likewise, the results remained qualitatively similar. In addition, the robust standard errors clustered by firm and the results remained qualitatively similar. The marginal effect for the baseline model has been conducted. The standard errors are displayed in parentheses. Stars indicate statistical significance: *p < .1, **p < .05, ***p < .01.

- **Robustness check for model 1 in Table 3.5:**

As a robustness check, the logistic regression for the period extends from 2009-2018 has been conducted below after decomposing total debt into both short-term loans & overdrafts and long-term debt, and after considering the sector effect.

Table 13: The Logistic Regression Models after using the Total Debt Components and Sector Effect

Variables	Model (1) 2009-2018 Random effect	Model (2) 2009-2018 Random effect with industry effect	Model (3) 2009-2018 OLS	Model (4) 2009-2018 *OLS with industry effect*	Model (5) 2009-2018 Marginal effect dy/dx
Long-term debt	-3.5466***	-3.4036***	-3.5469***	-3.4038***	-0.4304***
	(0.7406)	(0.7861)	(0.7406)	(0.7861)	(0.0890)
Short-term debt	0.2385	0.1956	0.2386	0.1957	0.0289
	(0.2384)	(0.2508)	(0.2384)	(0.2508)	(0.0289)
Firm growth	1.0427***	1.4199***	1.0428***	1.4201***	0.1265***
	(0.2116)	(0.2831)	(0.2117)	(0.2831)	(0.0254)
Foreign ownership	-0.0521	-0.3432	-0.0521	-0.3433	-0.0063
	(0.2132)	(0.2268)	(0.2132)	(0.2268)	(0.0259)
Firm age	0.0005	0.0014	0.0005	0.0014	0.00005
	(0.0035)	(0.0036)	(0.0035)	(0.0036)	(0.0004)
Audit	0.9563***	0.9897***	0.9563***	0.9896***	0.1161***
	(0.3274)	(0.3346)	(0.3274)	(0.3346)	(0.0398)
Industry	0.0382	1.9983***	0.0382	___	0 .0046
	(0.1506)	(0.2449)	(0.1506)	___	(0.0183)
Size	1.5822***	___	1.5823***	1.9987***	0.1920***
	(0.2125)	___	(0.2125)	(0.2449)	(0.0251)
Constant	-13.3341***	-15.5551***	-13.3351***	-15.5572***	___
	(1.3852)	(1.8113)	(1.3853)	(1.8113)	___
Wald chi^2	93.87***	112.60***	___	___	___
Pseudo R^2	___	___	0.0878***	0.1066***	___
Sector	not included	Included	not included	Included	___
N	1731	1708	1731	1708	___

Note: This Table estimates the SMES determinants of the FRS 102 adoption for the period extending from 2009-2018 after using long-term debt and short-term loans & overdrafts. The probability of the Chi2 of the Hausman test is not significant for the model, thus the random effect applied. To confirm that, the fixed effect has been conducted for the logistic regression and the STATA shows no results. Furthermore, years have been included in the regressions and the STATA shows no results for the years as they are collinear with the dependent variable. Thus, random effect has been applied and years have been excluded. Across models, the mean value of VIF is lower than 10, which implies that the collinearity does not pose any genuine concern over the empirical results (Gujarati, 2009). Further, the OLS estimation has been conducted and the results are qualitatively similar. In model (2 & 4), the sector variable replaced with industry dummies, and likewise, the results remained qualitatively similar. In addition, the robust standard errors clustered by firm and the results remained qualitatively similar. The marginal effect for the baseline model has been conducted. The standard errors are displayed in parentheses. Stars indicate statistical significance: *p < .1, **p < .05, ***p < .01.

- **Robustness check for models 2 in Table 3.4 and Model 4 in Table 3.5:**

As a robustness check, the logistic regression has been estimated for Model (2) and Model (4) in Table 3.4 and 3.5; respectively for the period extending from 2012-2018. Further, estimating total debt and its components for the same period.

Table 14: The Logistic Regression Models with the Components of Total Debt and Leverage.

Variables	Model (1) 2012-2018	Model (2) 2012-2018	Model (3) 2012-2018	Model (4) 2012-2018
Leverage	-0.3117	____	____	____
	(0.2016)	____	____	____
Short-term liabilities	____	0.0124	____	____
	____	(0.1868)	____	____
Long-term liabilities	____	-2.2434***	____	____
	____	(0.6205)	____	____
Total Debt	____	____	-0.2972	____
	____	____	(0.2862)	____
Long-term debt	____	____	____	-2.9467***
	____	____	____	(0.7715)
Short-term debt	____	____	____	0.1697
	____	____	____	(0.2331)
Firm growth	0.7174***	0.8135***	0.7580***	0.8677***
	(0.1907)	(0.2030)	(0.1922)	(0.2071)
Foreign ownership	0.0770	-0.0286	0.1004	-0.0094
	(0.2242)	(0.2286)	(0.2237)	(0.2283)
Firm age	0.0023	0.0013	0.0029	0.0017
	(0.0037)	(0.0037)	(0.0037)	(0.0037)
Audit	1.2966***	1.1567***	1.2960***	1.1953***
	(0.3324)	(0.3346)	(0.3315)	(0.3314)
Industry	0.0251	0.0205	0.0394	0.0052
	(0.1571)	(0.1582)	(0.1568)	(0.1586)
Size	0.6922***	1.0834***	0.7905***	1.1989***
	(0.1954)	(0.2310)	(0.1952)	(0.2288)
Constant	-7.0541***	-9.5612***	-7.8771***	-10.4531***
	(1.3093)	(1.5270)	(1.2791)	(1.4942)
Wald chi^2	53.37***	61.35***	53.15***	65.48***
N	1118	1118	1122	1122

Note: This Table estimates the SMES determinants of the FRS 102 adoption for the period extending from 2012-2018. The probability of the Chi^2 of the Hausman test is not significant for the models, thus the random effect applied. To confirm that, the fixed effect has been conducted for the logistic regression and the STATA shows no results. Furthermore, years have been included in the regressions and the STATA shows no results for the years as they are collinear with the dependent variable. Thus, random effect has been applied and years have been excluded. Across models, the mean value of VIF is lower than 10, which implies that the collinearity does not pose any genuine concern over the empirical results (Gujarati, 2009). In addition, the robust standard errors clustered by firm and the results remained qualitatively similar. The standard errors are displayed in parentheses. Stars indicate statistical significance: *p < .1, **p < .05, ***p < .01.

- **Robustness check for models in Table 3.7**.

As a robustness check, the logistic regression has been estimated for models in Table 3.7 as

below:

Table 15: The Logistic Regression for the Sub-sample Group

Variables	Model (1) 2009-2018 *Applied in 2015*	Model (2) 2009-2018 *Applied in 2016*	Model (3) 2009-2018 *Applied in 2017*
Leverage	-0.3756	-0.2787	-6.5351
	(0.3659)	(0.2697)	(6.1051)
Firm growth	1.1592***	0.7338***	7.4154
	(0.4102)	(0.2571)	(5.7781)
Foreign ownership	-0.1078	-0.3942	9.3609**
	(0.2726)	(0.3785)	(4.2302)
Firm age	0.0006	-0.0016	0.1012
	(0.0048)	(0.0058)	(0.0747)
Audit	2.4218**	0.5011	-5.3975*
	(1.1086)	(0.3872)	(2.8987)
Industry	0.0178	-0.1885	4.0196
	(0.2358)	(0.2139)	(3.3793)
Size	1.1156***	0.9997***	5.5357*
	(0.3544)	(0.2449)	(3.0749)
Constant	-11.1060***	-8.8876***	-42.1256*
	(2.5349)	(1.6288)	(22.3946)
Wald chi^2	23.19***	29.08***	5.83
N	534	925	237

Note: This Table estimates the SMES determinants of the FRS 102 adoption for the period extending from 2009-2018 for SMEs adopted in 2015, 2016, and 2017. The probability of the Chi2 of the Hausman test is not significant for the model, thus the random effect applied. To confirm that, the fixed effect has been conducted for the logistic regression and the STATA shows no results. Furthermore, years have been included in the regressions and the STATA shows no results for the years as they are collinear with the dependent variable. Thus, random effect has been applied and years have been excluded. Across models, the mean value of VIF is lower than 10, which implies that the collinearity does not pose any genuine concern over the empirical results (Gujarati, 2009). The standard errors are displayed in parentheses. Stars indicate statistical significance: $*p < .1$, $**p < .05$, $***p < .01$.

- **Robustness check for models in Table 3.7**.

As a robustness check, the logistic regression has been estimated for models in Table 3.7 after decomposing leverage into both long-term and current liabilities as below[95]:

Table 16: The Logistic Regression for the Sub-sample Group with Leverage Components

Variables	Model (1) 2009-2018	Model (2) 2009-2018
	Applied in 2015	Applied in 2016
Long-term liabilities	-1.8764**	-3.3511***
	(0.9500)	(0.8506)
Short-term liabilities	-0.0586	0.2147
	(0.3101)	(0.2331)
Firm growth	1.1737***	0.9826***
	(0.4104)	(0.2823)
Foreign ownership	-0.1757	-0.6518*
	(0.2761)	(0.3876)
Firm age	-0.0004	-0.0040
	(0.0048)	(0.0059)
Audit	2.2387**	0.2111
	(1.1035)	(0.3936)
Industry	0.0585	-0.1940
	(0.2367)	(0.2182)
Size	1.4654***	1.7624***
	(0.4058)	(0.3225)
Constant	-13.3218***	-13.7856***
	(2.8240)	(2.1090)
Wald chi^2	25.74***	41.75***
N	534	925

Note: This Table estimates the SMES determinants of the FRS 102 adoption for the period extending from 2009-2018 for SMEs adopted in 2015 and 2016 after decomposing leverage into short-term liabilities and long-term liabilities. The regression for those adopted in 2017 has been conducted and the STATA showed no results due to the low number of observations. The probability of the Chi2 of the Hausman test is not significant for the model, thus the random effect applied. To confirm that, the fixed effect has been conducted for the logistic regression and the STATA shows no results. Furthermore, years have been included in the regressions and the STATA shows no results for the years as they are collinear with the dependent variable. Thus, random effect has been applied and years have been excluded. Across models, the mean value of VIF is lower than 10, which implies that the collinearity does not pose any genuine concern over the empirical results (Gujarati, 2009). The standard errors are displayed in parentheses. Stars indicate statistical significance: *p < .1, **p < .05, ***p < .01.

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[95] Due to the low number of observations in year 2017, the model in the year 2017 provides no results.

- **Robustness check for models in Table 3.7**.

As a robustness check, the logistic regression has been estimated for models in Table 3.7 after using total debt which is the sum between short-term loans & overdrafts and long-term debt.

Table 17: The Logistic Regression for the Sub-sample Group with Total Debt

Variables	Model (1) 2009-2018	Model (2) 2009-2018
	Applied in 2015	Applied in 2016
Total debt	-0.2497	-0.6916
	(0.5122)	(0.4907)
Firm growth	1.1380***	0.8137***
	(0.3939)	(0.2665)
Foreign ownership	-0.0739	-0.4161
	(0.2702)	(0.3792)
Firm age	0.0011	-0.0014
	(0.0047)	(0.0057)
Audit	2.3791**	0.4879
	(1.0926)	(0.3860)
Industry	0.0119	-0.1765
	(0.2363)	(0.2134)
Size	1.2222***	1.2095***
	(0.3441)	(0.2698)
Constant	-11.9506***	-10.3915***
	-2.4389	(1.7413)
Wald chi^2	23.01***	30.08***
N	534	925

Note: This Table estimates the SMES determinants of the FRS 102 adoption for the period extending from 2009-2018 for SMEs adopted in 2015 and 2016 after using total debt which is the sum between short-term loans & overdrafts and long-term debt. The regression for those adopted in 2017 has been conducted and the STATA showed no results due to the low number of observations. The probability of the Chi2 of the Hausman test is not significant for the model, thus the random effect applied. To confirm that, the fixed effect has been conducted for the logistic regression and the STATA shows no results. Furthermore, years have been included in the regressions and the STATA shows no results for the years as they are collinear with the dependent variable. Thus, random effect has been applied and years have been excluded. Across models, the mean value of VIF is lower than 10, which implies that the collinearity does not pose any genuine concern over the empirical results (Gujarati, 2009). The standard errors are displayed in parentheses. Stars indicate statistical significance: *p < .1, **p < .05, ***p < .01.

The table below shows the main differences between firms accounts under the old UK GAAP and the new UK GAAP " FRS 102" for a specific firm adopted the FRS 102 in 2016. The annual reports for year 2015 and 2016 have been collected manually .2015 is considered as a transition year, where the numbers under year 2015 have been observed under both reports.

Table 18: The difference between old UK GAAP and FRS 102

Main Caption	*2015*	*2015*
	Old UK GAAP	New UK GAAP " FRS 102"
Total Assets	26,117,912	26,123,287
Total Liabilities	12,722,439	12,963,029
Total Equity	13,395,473	13,160,258
Profit for the financial year	3,281,414	4,468,331
Total comprehensive income	4,703,546	4,468,331

Appendix B

Appendix B shows the analysis related to the empirical paper 2 (Chapter 4) as below:

- **Robustness check for models in Table 4.6.**

As a robustness check, models in Table 4.6 in paper 2 (Chapter 4) are estimated again after clustering errors by sectors as below:

Table 1: Earning Management, FRS 102 and Leverage

	Model (1)	Model (2)	Model (3) H3	
	H1	**H2**	Before the interaction with FRS 102	Before the interaction with FRS 102
FRS 102	-0.0335**	____	-0.0243	
	(0.0154)		(0.0368)	
Leverage	-0.0020	0.1440**	0.1592	-0.0954***
	(0.0151)	(0.0521)	(0.1058)	(0.0318)
Firm Size	-0.0928*	-0.0521	0.0211	-0.0248
	(0.0464)	(0.0357)	(0.0324)	(0.0187)
Firm growth	0.0323***	0.0558***	0.0642***	-0.0160
	(0.0024)	(0.0126)	(0.0081)	(0.0208)
Cost of Debt	0.3433*	____	____	____
	(0.1611)			
CFO	-0.0071	____	____	____
	(0.0400)			
ROA	_____	-0.1374***	-0.0714**	0.1316**
		(0.0383)	(0.0252)	(0.0547)
DISSUE	0.0026	-0.0109	-0.0640***	0.0496*
	(0.0037)	(0.0091)	(0.0177)	(0.0244)
Audit	____	0.0737***	0.0617**	0.0274
		(0.0215)	(0.0254)	(0.0376)
Constant	0.8120**	0.3991	0.0306	
	(0.3371)	(0.2448)	(0.0711)	
R^2	0.3674	0.4434	0.4773	
Firms	Included	Included	Included	
Years	Included	Included	Included	
N	964	1465	1398	

Note: Equation (1) is the two-way fixed effect model which represent the relationship between *AWCA* and *FRS 102*. Equation (2) is the tow-way fixed effect model which represent the relationship between *AWCA* and *Leverage*. The DID model is the generalized DID with group fixed effect and time fixed effect, which reports the results before the adoption of *FRS 102* (i.e., before the interaction with *FRS 102*), and the results of the impact of *FRS 102* on the relationship between *AWCA* and *Leverage* (i.e., after the interaction with *FRS 102*). *Covariates* in the DID model trimmed at (1 and 99) percentile to control for the effect of outliers. The independent variables have been centered. Standard errors are displayed in parentheses. The robust standard errors clustered by sector. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

- **Sensitivity test for model (1) in Table 4.6.**

As a sensitivity test for Model (1) in Table 4.6 in paper 2 (Chapter 4), AWCA scaled by the previous year of total assets and the model estimated again as below:

Table 2: Earnings Management and FRS 102.

	Model (1)
	H1
FRS 102	-0.0418
	(0.0275)
Leverage	-0.0486
	(0.0505)
Firm Size	-0.3719
	(0.2882)
Firm Growth	0.0710*
	(0.0419)
Cost of Debt	0.6388*
	(0.3700)
CFO	0.1851
	(0.1398)
DISSUE	0.1015
	(0.0984)
Constant	2.8565
	(2.0762)
R^2	0.4406
Firms	Included
Years	Included
F-value	1.3813
N	971

Note: Model (1) is the two-way fixed effect model which represent the relationship between *AWCA* and *FRS 102*, where the AWCA scaled by the previous year of total assets. *AWCA* trimmed at (1 and 99) percentile to control for the effect of outliers. Standard errors are displayed in parentheses. The robust standard errors clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

- **Robustness check for model (2) in Table 4.6.**

As a robustness check, Model (2) in Table 4.6 in paper 2 (Chapter 4) which represent the relationship between earnings management and leverage has been estimated again after using total debt which represent the sum between long-term debt and short-term loans and overdraft as below:

Table 4: Earnings Management and Total Debt

	Model (1)
	H2
Total Debt	0.1641**
	(0.0693)
Firm Size	-0.1057**
	(0.0493)
ROA	-0.1639**
	(0.0694)
Firm growth	0.0562***
	(0.0123)
DISSUE	-0.0097
	(0.0115)
Audit	0.0678
	(0.0596)
Constant	0.7903**
	(0.3631)
R^2	0.4950
Firms	Included
Years	Included
F-value	3.1819
N	1154

Note: Model (1) is the two-way fixed effect model which represent the relationship between *AWCA* and *total debt*. *AWCA* trimmed at (1 and 99) percentile to control for the effect of outliers. Standard errors are displayed in parentheses. The robust standard errors clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

- **Further analysis for model (2) in Table 4.6.**

As a further analysis for Model 2 in Table 4.6 in paper 2 (Chapter 4), the researcher decomposed leverage (i.e., total liabilities) into both current liabilities and long-term liabilities. Model 1 represent the relationship between AWCA and both of current liabilities and long-term liabilities.

Table 5: Earnings Management and Leverage Components

	Model (1)
	H2
Long-term Liabilities	-0.0828
	(0.1257)
Current Liabilities	0.0813
	(0.1102)
Firm size	-0.0566
	(0.0421)
ROA	-0.1093**
	(0.0452)
Firm Growth	0.0623***
	(0.0105)
DISSUE	-0.0061
	(0.0069)
Audit	0.0810
	(0.0748)
Constant	0.3096
	(0.3190)
R^2	0.4989
Firms	Included
Years	Included
F-value	4.2280
N	1187

Note: Model (1) is the two-way fixed effect model which represent the relationship between *AWCA* and both long-term and current liabilities. *AWCA* trimmed at (1 and 99) percentile to control for the effect of outliers. Standard errors are displayed in parentheses. The robust standard errors clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively

- **Further analysis for model (2) in Table 4.6.**

As a further analysis for Model 2 in Table 4.6 in paper 2 (Chapter 4), the researcher decomposed total debt into both long-term debt and short-term overdrafts. Model 1 represent the relationship between AWCA and both of long-term debt and short-term overdrafts.

Table 6: Earnings Management and Total Debt Components

	Model (4)
	H2
Long-term debt	0.0738***
	(0.0216)
Short-term overdraft	0.1836*
	(0.1091)
Firm Size	-0.1347*
	(0.0730)
ROA	-0.1133
	(0.1131)
Firm growth	0.0295
	(0.0217)
DISSUE	0.0029
	(0.0120)
Constant	1.0711**
	(0.5122)
R2	0.3077
Firms	Included
Years	Included
F-value	2.0289
N	771

Note: Model (1) is the two-way fixed effect model which represent the relationship between *AWCA* and both long-term debt and short-term overdrafts. *AWCA* trimmed at (1 and 99) percentile to control for the effect of outliers. Standard errors are displayed in parentheses. Audit excluded due to the collinearity issue. The robust standard errors clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

- **Further analysis for model (3) in Table 4.6**

As a further analysis, Leverage (i.e., total liabilities) has been decomposed into both short-term and long-term liabilities for Model 3 in Table 4.6 in paper 2 (Chapter 4) as below:

Table 7: Earnings Management, FRS 102 and Leverage Components

	Model (1) H3		Model (2) H3	
	Long-term liabilities before the interaction with FRS 102	*Long-term liabilities after the interaction with FRS 102*	*Short-term liabilities before the interaction with FRS 102*	*Short-term liabilities after the interaction with FRS 102*
FRS 102	-0.0034 (0.0147)	———	-0.0025 (0.0150)	
Long-term liabilities	0.0026 (0.1279)	0.0071 (0.0938)	——	——
Current Liabilities	——	——	0.1179** (0.0513)	-0.0662 (0.0525)
Firm size	-0.0216 (0.0392)	-0.0093 (0.0222)	0.0052 (0.0340)	-0.0261 (0.0232)
ROA	-0.1318* (0.0734)	0.1125 (0.0902)	-0.0384 (0.0377)	0.0857 (0.0541)
Firm growth	0.0651*** (0.0084)	-0.0125 (0.0266)	0.0643*** (0.0086)	-0.0275 (0.0323)
DISSUE	-0.0754*** (0.0232)	0.0716** (0.0290)	-0.0639*** (0.0201)	0.0612** (0.0236)
Constant	0.1005*** (0.0230)		0.0969*** (0.0191)	
R^2	0.5147		0.4753	
Firms	Included		Included	
Years	Included		Included	
F-value	4.4663		4.2268	
N	1188		1459	

Note**:** The DID model is the generalized DID with group fixed effect and time fixed effect, which reports the results before the adoption of *FRS 102* (i.e., before the interaction with *FRS 102*), and the results of the impact of *FRS 102* on the relationship between *AWCA* and *Leverage* (i.e., after the interaction with *FRS 102*). Model (1) represent the impact of FRS 102 on the relationship between long-term liabilities and earnings management. Model (2) represent the impact of FRS 102 on the relationship between current liabilities and Earnings management. *Covariates* in the DID model trimmed at (1 and 99) percentile to control for the effect of outliers. The independent variables have been centered. Standard errors are displayed in parentheses. The robust standard errors clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

- **Sensitivity test for Model 3 in Table 4.6**

As a sensitivity test, Total debt which is the sum between long-term debt and short-term loans

and overdrafts has been estimated for Model (3) in Table 4.6 as below:

Table 8: The Impact of FRS 102 on the Relationship Between Earnings Management and Total Debt.

	Model (1)	
	H3	
	Before the interaction with FRS 102	*After the interaction with FRS 102*
FRS 102		-0.0371 (0.0512)
Total debt	0.0231 (0.0770)	0.0301 (0.0722)
Firm size	0.0012 (0.0449)	-0.0312 (0.0196)
ROA	-0.0399 (0.0395)	0.1091 (0.0692)
Firm growth	0.0655*** (0.0087)	-0.0283 (0.0338)
DISSUE	-0.0672*** (0.0235)	0.0692** (0.0292)
Audit	0.0467 (0.0489)	0.0556 (0.0545)
Constant	0.0017 (0.0922)	
R^2	0.5287	
Firms	Included	
Years	Included	
F-value	4.0573	
N	1102	

The DID model is the generalized DID with group fixed effect and time fixed effect, which reports the results before the adoption of *FRS 102* (i.e., before the interaction with *FRS 102*), and the results of the impact of *FRS 102* on the relationship between *AWCA* and *Leverage* (i.e., after the interaction with *FRS 102*). Model (1) represent the impact of FRS 102 on the relationship between total debt and earnings management. *Covariates* in the DID model trimmed at (1 and 99) percentile to control for the effect of outliers. The independent variables have been centered. Standard errors are displayed in parentheses. The robust standard errors clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

- **Sensitivity test for Model 3 in Table 4.6**

As a sensitivity test, Total debt decomposed into both long-term debt and short-term loans and

overdrafts, and it has been estimated for Model (3) in Table 4.6 as below:

Table 8: The Impact of FRS 102 on the Relationship Between Earnings Management and Total Debt components.

	Model (1)	
	H3	
	Before the interaction with FRS 102	*After the interaction with FRS 102*
FRS 102	0.0313	
	(0.0236)	
Long-term debt	-0.0101	0.1015
	(0.0393)	(0.0615)
Short-term debt	0.1001	0.1616
	(0.1112)	(0.1870)
Firm size	0.0721	-0.0398*
	(0.0464)	(0.0229)
ROA	-0.0827	0.0844
	(0.0634)	(0.1093)
Firm growth	0.0722***	-0.0618***
	(0.0016)	(0.0236)
DISSUE	-0.1022***	0.1167**
	(0.0317)	(0.0467)
CFO	0.0391	-0.0314
	(0.0530)	(0.1073)
Constant	0.0770***	
	(0.0268)	
R^2	0.7842	
Firms	Included	
Years	Included	
F-value	121.0354	
N	652	

Note: Model (1) is the generalized DID with group fixed effect and time fixed effect, which reports the results before the adoption of *FRS 102* (i.e., before the interaction with *FRS 102*), and the results of the impact of *FRS 102* on the relationship between *AWCA* and both *long-term debt and short-term debt* (i.e., after the interaction with *FRS 102*). *Covariates* in the DID model trimmed at (1 and 99) percentile to control for the effect of outliers. The independent variables have been centered. Standard errors are displayed in parentheses. The robust standard errors clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

- **Robustness check for Table 4.6**

As a robustness check, Table 4.6 estimated again for the period extending from 2012-2019.

Table 9: Earnings management and FRS 102 for the period 2012-2019.

	Model (1)	Model (2)	Model (3)	
	H1	**H2**	*Before the interaction with FRS 102*	*After the interaction with FRS 102*
FRS 102	-0.0197		0.0398	
	(0.0146)	——	(0.0461)	
Leverage	0.0198	0.0755	0.1697	-0.0852*
	(0.0661)	(0.0550)	(0.1089)	(0.0510)
Firm size	-0.0029	0.0413	0.0413	-0.0109
	(0.0450)	(0.0575)	(0.0532)	(0.0217)
Firm growth	0.0181***	0.0328***	0.0410	0.0033
	(0.0059)	(0.0115)	(0.0326)	(0.0443)
Cost of debt	0.3258**			
	(0.1599)	——	——	——
CFO	-0.0329			
	(0.0423)	——	——	——
ROA		-0.0702	-0.0816	0.1507**
	——	(0.0510)	(0.0504)	(0.0721)
DISSUE	-0.0128**	-0.0261***	-0.0299*	0.0077
	(0.0052)	(0.0087)	(0.0180)	(0.0222)
Audit		0.1378*	0.1601**	-0.0438
	——	(0.0760)	(0.0779)	(0.0464)
Constant	0.0982	-0.3377	-0.0526	
	(0.3119)	(0.3914)	(0.0753)	
R^2	0.0295	0.0588	0.0941	
Firms	Included	Included	Included	
Years	Included	Included	Included	
F-value	2.0242	1.8000	1.2888	
N	744	1195	1142	

Note: Model (1) is the two-way fixed effect model which represent the relationship between *AWCA* and *FRS 102*. Model (2) is the tow-way fixed effect model which represent the relationship between *AWCA* and *Leverage*. The DID model is the generalized DID with group fixed effect and time fixed effect, which reports the results before the adoption of *FRS 102* (i.e., before the interaction with *FRS 102*), and the results of the impact of *FRS 102* on the relationship between *AWCA* and *Leverage* (i.e., after the interaction with *FRS 102*). *Covariates* in the DID model trimmed at (1 and 99) percentile to control for the effect of outliers. The independent variables have been centered. Standard errors are displayed in parentheses. The robust standard errors clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

- **Robustness check for Model 2 in Table 4.6:**

To address the issue of the endogeneity between earnings management and leverage, I use one-year lags of all covariates as below:

Table 10: Earnings management and Leverage with lagged covariates

	Model (1)
L. Leverage	0.0086
	(0.0266)
L. Firm size	0.0837**
	(0.0380)
L. ROA	0.0660*
	(0.0391)
L. Firm growth	-0.0007
	(0.0029)
L. DISSUE	0.0130
	(0.0088)
L. Audit	-0.0030
	(0.0462)
Constant	-0.5180**
	(0.2505)
R^2	0.0348
F-value	1.5381
Firms	Included
Years	Included
N	1088

Note: The above Table estimate the relationship between earnings management and leverage. All covariates estimated by using one-year lags. *Covariates* trimmed at (2 and 98) percentile to control for the effect of outliers. Standard errors are displayed in parentheses. The robust standard errors clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

- **Robustness check for Model 2 in Table 4.6**

To check if the relationship between earnings management and leverage in Model (2) in Table

4.6 is simultaneously determined, the following estimation has been conducted.

Table 11: Leverage and Earnings Management

Variables	Equation (2)
AWCA	0.5595*
	(0.3234)
Firm size	-0.4846**
	(0.2217)
Firm growth	-0.0203
	(0.0166)
ROA	-0.2756
	(0.2815)
DISSUE	0.0152
	(0.0172)
Constant	3.8912**
	(1.5017)
R^2	0.1856
F-value	1.5587
Firms	Included
Years	Included
N	1526

Note: The above Table estimate the relationship between leverage and earnings management, where leverage is the dependent variable. The above-applied model is the two-way fixed effect model. *AWCA* trimmed at (1 and 99) percentile to control for the effect of outliers. Standard errors are displayed in parentheses. The robust standard errors clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

- **Robustness check for Table 4.6**

I have followed DeFond and Park (2001) to re-estimate the regression in Table 4.6 through using alternative accrual model. In particular, the abnormal accrual measure that has been used in Chapter 4 has been replaced with discretionary accruals calculated from the following working capital version of the quarterly Jones model:

$$(WC_t - WC_{t-1}) = \alpha + \beta_1(S_t - S_{t-1}) + \sum Years + \varepsilon$$

Where:

WC = is non-cash working capital accruals, and the Working capital accruals are calculated as the difference between current assets excluding cash and short-term investments and current liabilities excluding short-term debt.

WC_t = noncash working capital in the current year.

WC_{t-1} = noncash working capital in the previous year.

S_t = sales in the current year.

S_{t-1} = sales in the previous year.

$\sum Years$ = dummies for years 2009-2019.

ε = error term.

The error term from the above equation is the abnormal working capital accruals. To get the error term, the above model estimated using pooled cross-sectional data, by industry. In particular, the above model estimated separately for each industry in the study's sample.

After estimating the abnormal working capital above, the regression in Table 4.6 has been estimated again with the above alternative measure, and the results remained qualitatively similar for the variable of interest " leverage" particularly in the DID model which use to examine the study hypothesis. The results are presented below:

- **Table 4 Earnings management, FRS 102 and Leverage by using alternative accrual measure.**

Variables	Model (1)	Model (3)	Model (3) Before the interaction with FRS 102	After the interaction with FRS 102
FRS 102	0.0017	――	-0.0924	
	(0.0169)		(0.1318)	
Leverage	-0.0041	0.0909	0.1511	-0.0775
	(0.0166)	(0.0607)	(0.1032)	(0.0516)
Firm Size	-0.0708**	-0.2372**	-0.0674**	-0.0240
	(0.0330)	(0.1177)	(0.0325)	(0.0214)
Firm Growth	-0.0004	-0.0050*	-0.0028	0.0151
	(0.0014)	(0.0027)	(0.0022)	(0.0220)
Cost of Debt	0.1179	――		
	(0.1364)			
CFO	0.0026	――		
	(0.0414)			
DISSUE	-0.0014*	-0.0015	0.0023	-0.0120
	(0.0009)	(0.0035)	(0.0108)	(0.0188)
ROA	――	0.0038	-0.0223	0.0910
		(0.0575)	(0.0394)	(0.0723)
Audit	――	0.0119	-0.0963	0.1239
		(0.0802)	(0.1212)	(0.1336)
Constant	0.6331***	1.7655**	0.2889*	
	(0.2341)	(0.7941)	(0.1576)	
R^2	0.0416	0.0790	0.0742	
Firms	Included	Included	Included	
Years	Included	Included	Included	
F	1.1497	1.9587	1.7542	
N	947	1432	1378	

Note: Model (1) is the two-way fixed effect model which represents the relationship between *AWCA* and *FRS 102*. Model (2) is the two-way fixed effect model which represents the relationship between *AWCA* and *Leverage*. The DID model is the generalized DID with group fixed effect and time fixed effect, which reports the results before the adoption of *FRS 102* (i.e., before the interaction with *FRS 102*), and the results of the impact of *FRS 102* on the relationship between *AWCA* and *Leverage* (i.e., after the interaction with *FRS 102*). *Covariates* in the DID model are trimmed at (1 and 99) percentile to control for the effect of outliers. The independent variables have been centered. Standard errors are displayed in parentheses. The robust standard errors are clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

Appendix C

Appendix B shows the analysis related to the empirical paper 3 (Chapter 5) as below:

- **Robustness check for the relationship between trade credit received and bank credit**

As a robustness check, the relationship between trade credit received and bank credit for the balanced sample (i.e., all firms have the same beginning and ending year) from 2009 to 2018 has been estimated as below:

Table 1: Trade credit received and bank financing for the balanced sample (2009-2018)

	Baseline model for trade credit received	Baseline model for trade credit received	Baseline model for trade credit received
	H1a vs. H1b **2009-2018** *Fixed effect*	**H1a vs. H1b** **2009-2018** *Random effect*	**H1a vs. H1b** **2009-2018** *OLS*
Leverage	-0.0404* (0.0215)	-0.0370* (0.0194)	-0.0257 (0.0368)
Firm size	-0.0053 (0.0325)	-0.0421** (0.0213)	-0.0978*** (0.0279)
Financial cost	0.1146 (0.1024)	0.0611 (0.0890)	-0.1523 (0.1780)
Purchases	0.0364*** (0.0116)	0.0456*** (0.0098)	0.0531*** (0.0147)
Sales growth	0.0014 (0.0015)	0.0014 (0.0016)	0.0056* (0.0031)
Constant	0.1437 (0.2214)	0.3845** (0.1501)	0.7567*** (0.1996)
R^2	0.1414	0.1344	0.3860
F-value	3.9658	___	5.8626
Wald chi^2	____	102.22***	___
Firms	Included	____	___
Years	Included	Included	Included
N	626		626

Notes: This Table reports the results of the relationship between *Trade credit received* and bank credit (*Leverage*). The Baseline model reports the results for the whole sample period (i.e., 2009-2018). Standard errors are displayed in parentheses. The probability of the Chi2 of the Hausman test is significant at 10% for the trade credit received model. Thus, the fixed effect estimator used. Additionally, both random effect and OLS estimator for the model has been applied and the results are qualitatively similar. The DID with two-way fixed effect has not been applied as the sample in this case is balanced sample. The robust standard errors clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

- **Robustness check for the relationship between trade credit received and bank credit.**

As a robustness check, the relationship between trade credit received and bank credit after decomposing leverage into long-term debt and short-term debt for the balanced sample (i.e., all firms have the same beginning and ending year) from 2009 to 2018 has been estimated as below:

Table 2: Trade credit received and bank financing for the balanced sample (2009-2018) with Leverage Components

	Baseline model for trade credit received	Baseline model for trade credit received	Baseline model for trade credit received
	H1a vs. H1b **2009-2018**	**H1a vs. H1b** **2009-2018**	**H1a vs. H1b** **2009-2018**
	Fixed effect	*Random effect*	*OLS*
Short-term debt	-0.0525	-0.0635	-0.0632
	(0.0406)	(0.0392)	(0.0620)
Long-term debt	-0.0880***	-0.0942***	-0.0937
	(0.0287)	(0.0243)	(0.0665)
Firm size	-0.0173	-0.0770***	-0.1616***
	(0.0372)	(0.0234)	(0.0318)
Financial cost	-0.0147	0.0276	0.2109
	(0.1659)	(0.1925)	(0.4760)
Sales growth	0.0001	-0.0000	-0.0022***
	(0.0004)	(0.0004)	(0.0008)
Constant	0.2773	0.6854***	1.2604***
	(0.2551)	(0.1598)	(0.2251)
Wald chi^2	____	65.69***	
Firms	Included	____	____
Years	Included	Included	Included
R^2	0.0689		0.3331
F-value	2.1098		4.5048
N	556	556	556

Notes: This Table reports the results of the relationship between *Trade credit received* and bank credit (*Leverage*) after decomposing leverage into long-term debt and short-term debt. The Baseline model reports the results for the whole sample period (i.e., 2009-2018). Standard errors are displayed in parentheses. The probability of the Chi2 of the Hausman test is significant at 1% for the trade credit received model. Thus, the fixed effect estimator used. Additionally, both random effect and OLS estimator for the model has been applied and the results are qualitatively similar. The DID with two-way fixed effect has not been applied as the sample in this case is balanced sample. The robust standard errors clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

- **Robustness check for the relationship between trade credit supplied and bank credit**

As a robustness check, the relationship between trade credit supplied and bank credit for the balanced sample (i.e., all firms have the same beginning and ending year) from 2009 to 2018 has been estimated as below:

Table 3: Trade credit supplied and bank financing for the balanced sample (2009-2018)

	Baseline model for trade credit supplied H1c	Baseline model for trade credit supplied H1c	Baseline model for trade credit supplied H1c
	2009-2018	**2009-2018**	**2009-2018**
	Fixed effect	*Random effect*	*OLS*
STLEV	0.0324*	0.0284	0.0012
	(0.0191)	(0.0245)	(0.0233)
Firm size	0.0103	-0.0135	-0.0347
	(0.0423)	(0.0267)	(0.0264)
Firm age	0.0979*	0.0167	0.0006
	(0.0564)	(0.0195)	(0.0181)
Financial cost	-0.0323	-0.0641	-0.0362
	(0.0783)	(0.0717)	(0.1282)
Cashflow	0.1259***	0.1221**	0.0960
	(0.0474)	(0.0502)	(0.0688)
Turn	0.0054	0.0047	0.0011
	(0.0036)	(0.0031)	(0.0032)
sales growth	-0.0006	-0.0007	-0.0014***
	(0.0007)	(0.0006)	(0.0005)
constant	-0.0770	0.1834	0.3739**
	(0.2855)	(0.1826)	(0.1814)
Wald chi^2		33.82***	
R^2	0.2490	___	0.0767
F-value	2.7277	___	2.9496
Firms	Included	___	___
Years	Included	Included	Included
N	731	726	726

Notes: This Table reports the results of the relationship between *Trade credit supplied* and bank credit (*Leverage*). The Baseline model reports the results for the whole sample period (i.e., 2009-2018). Standard errors are displayed in parentheses. The probability of the Chi2 of the Hausman test is significant at 5 % for trade credit supplied model. Thus, the fixed effect estimator used. Additionally, the OLS estimator for the model has been applied and the results are qualitatively similar. The DID with two-way fixed effect has not been applied as the sample in this case is balanced sample. The robust standard errors clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

- **Random effect estimation for the baseline model for trade credit supplied.**

The results of the Hausman test for the baseline model of the trade credit supplied is not significant for the period 2009-2019, thus the random effect estimator has been estimated as below:

Table 4: Random Effect for Trade Credit Supplied and Short-term Bank Financing

	Baseline model for trade credit supplied 2009-2019
	H1C *Random effect*
STLEV	0.0202 (0.0142)
Firm size	0.0333* (0.0175)
Firm age	-0.0045 (0.0168)
Financial cost	-0.2012** (0.0905)
Cashflow	0.1290*** (0.0384)
Turn	0.0050** (0.0023)
Sales growth	-0.0001 (0.0004)
Constant	-0.1071 (0.1238)
R^2	0.2573
Wald chi^2	55.54
Prob > chi^2	0.000
N	924

Notes: This Table reports the results of the relationship between *Trade credit supplied* and bank credit (*Leverage*). The Baseline model reports the results for the whole sample period (i.e., 2009-2019) by using the random effect estimation. *Firm size, financial cost, and sales growth* have been trimmed at (1 and 99) percentile to control for the effect of outliers. Standard errors are displayed in parentheses. The robust standard errors clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

- **Robustness check for the relationship between trade credit received and bank credit for the period from 2012-2019.**

As a robustness check, baseline model and the generalized DID models have been estimated again for the trade credit received and bank credit for the period extending from 2012 to 2019 as below:

Table 5: Trade credit received and bank financing (2012-2019)

	Baseline model for trade credit received	**DID model for trade credit received**		**DID time lagged model for Trade credit received**	
	2012-2019	*Before the interaction with FRS 102*	*After the interaction with FRS 102*	*Before the interaction with FRS 102*	*After the interaction with FRS 102*
Leverage	-0.0240*	-0.0852***	0.0602***	-0.0874***	0.0618***
	(0.0143)	(0.0231)	(0.0192)	(0.0228)	(0.0191)
Firm size	-0.0094	0.0050	-0.0300	0.0037	-0.0293
	(0.0303)	(0.0356)	(0.0194)	(0.0346)	(0.0194)
Financial cost	0.1768	0.6848**	-0.5681**	0.7041**	-0.6395**
	(0.2140)	(0.2936)	(0.2809)	(0.2817)	(0.2794)
Purchases	0.0325*	0.0359**	-0.0090	0.0372**	-0.0073
	(0.0177)	(0.0175)	(0.0089)	(0.0173)	(0.0089)
Sales growth	0.0441***	0.0167	0.0356	0.0166	0.0358
	(0.0112)	(0.0202)	(0.0273)	(0.0200)	(0.0268)
FRS 102		0.0024		0.0091	
		(0.0104)		(0.0115)	
Lag1 × FRS 102					0.0227*
					(0.0135)
Lag2 × FRS 102					0.0086
					(0.0140)
Lag3 × FRS 102					0.0098
					(0.0179)
Constant	0.1843	0.1603***		0.1609***	
	(0.2130)	(0.0081)		(0.0081)	
R²	0.1697	0.2098		0.2160	
F-value	7.4559***	4.6344***		4.2098***	
Firms	Included	Included		Included	
Years	Included	Included		Included	
N	595	595		595	

Notes: This Table reports the results of the relationship between *Trade credit received* and bank credit (*Leverage*). The Baseline model reports the results for the whole sample period (i.e., 2012-2019). The DID model is the generalized DID with group fixed effect and time fixed effect, which reports the results before the adoption of FRS 102 (i.e., before the interaction with *FRS 102*), and the results of the impact of FRS 102 on the relationship between *Trade credit received* and bank credit (i.e., after the interaction with *FRS 102*). The DID time lagged model is the lagged generalized DID with group fixed effect and time fixed effect for examining whether the effect of FRS 102 vary with time, which is a robustness check model for the DID model. The probability of the Chi2 of the Hausman test is significant at 1 % for baseline model. Thus, the fixed effect estimator applied to address the issue of omitted variable bias (Wooldridge, 2010). *Covariates* trimmed at (1 and 99) percentile to control for the effect of outliers. The independent variables have been centered. Standard errors are displayed in parentheses. The robust standard errors clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.

- **Robustness check for the relationship between trade credit supplied and bank credit for the period from 2012-2019.**

As a robustness check, baseline model and the generalized DID models have been estimated again for the trade credit supplied and bank credit for the period extending from 2012 to 2019 as below:

Table 6: Trade credit supplied and bank financing (2012-2019)

	Baseline model for trade credit supplied	DID model for trade credit supplied		DID time lagged model for Trade credit supplied	
	2012-2019	*Before the interaction with FRS 102*	*After the interaction with FRS 102*	*Before the interaction with FRS 102*	*After the interaction with FRS 102*
STLEV	0.0658*	0.0359*	0.0692	0.0342*	0.0698
	(0.0336)	(0.0206)	(0.0454)	(0.0203)	(0.0463)
Firm size	0.0078	0.0399	-0.0239	0.0340	-0.0220
	(0.0576)	(0.0457)	(0.0169)	(0.0457)	(0.0163)
Firm age	0.0494	0.0892	0.0140	0.1031	0.0121
	(0.0643)	(0.0767)	(0.0183)	(0.0743)	(0.0185)
Financial cost	-0.2295*	-0.3396*	0.2624	-0.3342*	0.2174
	(0.1376)	(0.1842)	(0.2061)	(0.1899)	(0.2054)
Cashflow	0.1267***	0.0597***	0.0828**	0.0585***	0.0852**
	(0.0417)	(0.0184)	(0.0363)	(0.0177)	(0.0358)
Turn	0.0039	0.0050	-0.0009	0.0049	-0.0003
	(0.0032)	(0.0035)	(0.0024)	(0.0034)	(0.0023)
Sales growth	-0.0041	-0.0340***	0.0315**	-0.0328***	0.0305**
	(0.0029)	(0.0123)	(0.0128)	(0.0121)	(0.0126)
FRS 102		0.0161		0.0226**	
		(0.0104)		(0.0109)	
Lag1 × FRS 102					0.0114
					(0.0113)
Lag2 × FRS 102					0.0220
					(0.0138)
Lag3 × FRS 102					0.0134
					(0.0133)
Constant	0.0145	0.1512***		0.1524***	
	(0.3824)	(0.0073)		(0.0073)	
R^2	0.2660	0.3140		0.3192	
F-value	1.9023**	3.2311***		3.1717***	
N	719	719		719	

Notes: This Table reports the results of the relationship between *Trade credit supplied* and bank credit (*Leverage*). The Baseline model reports the results for the whole sample period (i.e., 2012-2019). The DID model is the generalized DID with group fixed effect and time fixed effect, which reports the results before the adoption of FRS 102 (i.e., before the interaction with *FRS 102*), and the results of the impact of FRS 102 on the relationship between *Trade credit supplied* and bank credit (i.e., after the interaction with *FRS 102*). The DID time lagged model is the lagged generalized DID with group fixed effect and time fixed effect for examining whether the effect of FRS 102 vary with time, which is a robustness check model for the DID model. The probability of the Chi2 of the Hausman test is significant at 5 % for baseline model. Thus, the fixed effect estimator applied to address the issue of omitted variable bias (Wooldridge, 2010). *STLEV trimmed* at (1 and 99) percentile to control for the effect of outliers. The independent variables have been centered. Standard errors are displayed in parentheses. The robust standard errors clustered by firm. *, **, *** indicate statistical significance at $p < 0.1$, $p < 0.05$ and $p < 0.01$, respectively.