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AN EMPIRICAL ANALYSIS OF FACTORS AFFECTING FINANCING

ACCESSIBILITY FOR SMALL AND MEDIUM - SIZED ENTERPRISES

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Declaration

This dissertation is the result of my own work and includes nothing, which is the outcome of work done in collaboration except where specifically indicated in the text. It has not been previously submitted, in part or whole, to any university of institution for any degree, diploma, or other qualification.

In accordance with the Code of practice: research degrees guidelines, this thesis does not exceed 60,000 words.

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Abstract

This thesis investigates the challenges small and medium-sized enterprises (SMEs) face in accessing finance and proposes potential policy solutions to improve access. The research comprises three empirical projects, utilizing various econometric techniques and data sources to offer a holistic understanding of SME financing.

The first project examines the effects of external audits, international standard certification, and government contracts on SMEs' financial access. The findings reveal that external audits and international standard certification positively influence SME financing, while procurement of government contracts has a negative impact on financial access. The second project explores the impact of adopting International Financial Reporting Standards for SMEs (IFRS for SMEs) on their financing. The results demonstrate that IFRS for SMEs adoption significantly enhances financial access. The third project investigates the consequences of interest rate caps (IRC) on SME financing, emphasizing their unintended repercussions. The study indicates that IRC can adversely affect SME financing, particularly for smaller enterprises, due to the policy's restrictive nature.

The thesis concludes that factors such as institutional quality, financial development, corruption perception, and collateral requirements pose considerable challenges to SME financing. It proposes practical policy solutions, including enhancing institutional quality, fostering financial development, reducing corruption levels, and re-evaluating the reliance on collateral requirements. Policymakers should also consider alternative approaches like credit guarantees, loan subsidies, and risk-sharing mechanisms to encourage SME financing.

In conclusion, this thesis provides valuable policy recommendations to promote SME financing in developing countries. The findings can inform policymakers, industry practitioners, and academics about potential solutions to SMEs' challenges. Future research could examine the influence of political instability, cultural factors, and technological advancements on SME financing and assess alternative policies' effectiveness in various contexts. The research methodology utilized in this thesis incorporates diverse econometric techniques and data sources, ensuring robust and comprehensive results.

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Glossary of acronym and terms

Acronym	Meaning
AFR	Sub-Saharan Africa
CBK	Central Bank of Kenya
CEMAC	Economic and Monetary Community of Central Africa
CGAP	Consultative group to assist the poor
CMP	Conditional mixed process
CPI	Corruption Perception Index
EAP	East Asia and the Pacific
ECA	Europe and Central Asia
FD	Financial development index
FDI	Foreign Direct investment
FC	Fixed Capital
GAAP	Generally accepted accounting principles
GNI	Gross National Income
HIC	High-income countries
IASB	International Accounting and standards Board
IFAC	International Federation of Accountants
IFC	International Finance Corporation
IFRS	International Financial reporting standards
IMF	International Monetary Fund
IQ	Institutional quality
IRC	Interest rate cap/ceiling
IRRD	Interest rate repression database
ISAR	International standards of accounting and reporting
ISC	International Standards certificate
ISO	International Organization for Standardization
LAC	Latin America and the Caribbean
LIC	Low-income countries
LMIC	Lower-middle-income countries
MNA	Middle East and North Africa
OECD	Organization for Economic Cooperation and Development
REPARIS	The road to Europe: Program of Accounting Reform and Institutional Strengthening
ROSC – AA	Reports on the observance of codes and standards – Accounting and Auditing
SAR	South Asia Region
SME	Small and Medium-sized enterprises
UK-BEIS	Department for Business, Energy, and Industrial Strategy
UMIC	Upper-middle-income countries
UNCTAD	United Nations Conference on Trade and Development
UN-SDGs	United Nations Sustainable Development Goals
WAEMU	West African Economic and Monetary Union
WBES	World Bank Enterprise Survey
WC	Working Capital
WDI	World Development Indicators
WGI	World Governance Indicators
WTO	World Trade Organization

Chapter 1

Overview of Thesis

"Small and medium-sized enterprises (SMEs) are the backbone of many economies, contributing significantly to job creation and economic growth. However, they face significant challenges in accessing finance, which can hinder their development and growth. Addressing the SME finance gap requires a multi-faceted approach, including improving access to financial services, strengthening financial infrastructure, and promoting policies that support SME development."

(World Bank, 2021)

1.0 Introduction

Small and medium-sized enterprises (SMEs) are recognized as key contributors to economic growth and job creation worldwide (Ayyagari et al. 2011; Stone 2019; Zhan et al. 2016a). In developing countries, SMEs can account for up to 33 percent of gross domestic product and employ up to 45 percent of the labour force, and their contribution is even higher if informal sector businesses are included (IFC 2010; Ayyagari et al. 2011). Similarly, in developed regions such as the Organization for Economic Cooperation and Development (OECD), SMEs employ 70 percent of the labour force and contribute up to 50 percent of the value created (OECD 2019). Moreover, SMEs play a crucial role in creating a positive local community multiplier effect compared to large corporations (Motta 2020; OECD 2017). Despite their significance, SME growth is often hindered by several challenges, and access to finance is identified as a major obstacle to their development (Kersten et al. 2017; Quartey et al. 2017).

The SME financing gap is estimated to exceed $5 trillion globally, highlighting the need for innovative financing solutions (World Bank 2021). To address this issue, this thesis investigates the impact of external audit, international standard certification (ISC), and government contract procurement, adoption of the international financial reporting standard for SME (IFRS for SME), and the implementation of interest rate cap (IRC) policies on SME access to finance. The research uses a comprehensive dataset covering over 150 countries from six geographic regions, providing valuable insights into the factors that affect SMEs' access to finance. The study contributes to the current policy debate on the design of appropriate policies that promote SME financial growth and development.

The structure of this chapter is organized as follows: Section 1.1 provides a background to the research, including the rationale and motivation for the study. Section 1.2 identifies the three research problems that this study addresses, while Section 1.3 outlines the five research questions that guide the investigation. Section 1.4 describes the significant contributions and gaps addressed in the study, highlighting the areas where this research adds new insights to the existing literature. In Section 1.5, the key terms used in the study are defined to ensure clarity and consistency in their usage throughout the thesis. Section 1.6 provides an overview of the primary data source used in the research, including the data access protocol, data features, advantages, and limitations. Finally, Section 1.7 concludes with an outline of the structure of

the thesis, which includes the empirical studies conducted, their key findings, and their implications for SME finance policy and practice.

1.1 Research Background

1.1.1 Understanding Agency Costs and Ownership Structure in SME Financing

The theory of the firm is essential to understanding the behaviour, agency costs, and the ownership structure of firms (Jensen and Meckling, 1976). This thesis uses the theory to develop hypotheses that examine the impact of firm-level and country-level factors on SME access to finance. Agency problems arise when decision-making power is transferred from the principal to the agent, and this can manifest in different forms depending on the ownership structure and size of the firm. In SMEs, the most common agency problem is between business owners and creditors due to high information asymmetry and poor financial record-keeping practices (Berger and Udell, 2006).

To address this problem, this study focuses on factors that can reduce information asymmetry and mitigate agency costs, such as audited financial statements and the adoption of IFRS for SMEs (Abdul et al., 2016; Ryan and Ryan, 2016). Previous research has analyzed various ownership dynamics that influence SME access to finance, including family ownership, government ownership, foreign ownership, and gender. Family ownership, for instance, is aimed at maintaining control but can lead to credit restrictions, particularly where succession plans are weak (Gómez-Mejía et al., 2007). Similarly, female-owned enterprises face more challenges in accessing credit, potentially due to gender-based discrimination, cultural stereotypes and beliefs, and the dominance of state-owned banks in patriarchal social systems (Bruhn and Zia, 2018).

Foreign ownership, on the other hand, can reduce financial constraints, particularly for firms in developing countries with underdeveloped financial markets and weak institutional quality (Ayyagari et al., 2011). Meanwhile, government ownership is associated with an increase in the cost of debt in privatized firms and a decrease in publicly listed firms (Megginson and Netter, 2001). However, the length of the privatization process may affect these results (Megginson and Nash, 2003). Owner-manager attributes, such as age, gender, and experience level, can also affect SME access to finance, with recent studies showing that more women entrepreneurs are seeking formal credit from banking institutions (World Bank, 2018).

1.1.2 Mitigating Information Asymmetry and Agency Problems in Firm Financing

SMEs often struggle to obtain external financing due to high informational asymmetry, which limits their financing options when compared to publicly listed firms (Hanedar et al. 2014). This asymmetry leads to adverse selection and moral hazard problems in financial accounting theory. Adverse selection results in discriminative credit terms favouring specific borrowers, such as government lending, which is perceived as less risky, over higher-risk borrowers like SMEs. On the other hand, moral hazard occurs when borrowers take on more risk than agreed upon without full disclosure (Bushman and Smith 2003).

SMEs often have highly concentrated ownership structures, such as family-owned firms, that constrain access to finance (Mertzanis 2019; Murro and Peruzzi 2019a). Because of the fear of ownership dilution, SMEs are more likely to rely on debt financing from banks. The pecking order theory suggests that firms prefer to use internal funds before seeking external credit (Myers 2001), but many SMEs struggle to access financial markets because of their size, age, and ownership structure. The agency problem arising from asymmetric information means that firms incur agency costs, including monitoring costs, bonding costs, and residual costs (Deegan 2013). To reduce monitoring costs, firms can engage in third-party evaluations of performance, such as establishing a board of directors (Jensen and Meckling 1976). In the case of SMEs, which often have smaller organizational structures, an external auditor can serve as an effective monitor (Abbott et al. 2019). Bonding costs, on the other hand, refer to costs borne by an agent, such as firms agreeing to prepare and present financial statements to creditors (Bushman and Smith 2003). To mitigate bonding costs, SMEs can prepare accurate and proper financial records certified by external auditors (Abbott et al. 2019).

Besides external audit certifications, the adoption of International Financial Reporting Standards (IFRS) for SMEs can improve access to finance by increasing the comparability and transparency of financial statements (Khlif et al. 2019). IFRS adoption can also reduce information asymmetry and mitigate agency costs by improving the quality of financial reporting (Iatridis 2013). However, IFRS adoption can also impose additional costs, particularly for SMEs with limited resources and expertise in financial reporting (Nobes and Parker 2012). Overall, reducing information asymmetry and mitigating agency problems is crucial in improving access to finance for SMEs. Mitigation measures include hiring external auditors, adopting IFRS for SMEs, and maintaining proper financial records (Bushman and Smith 2003; Abbott et al. 2019; Khlif et al. 2019).

1.1.3 Access to finance; formal vs informal finance

Access to finance is a critical factor for the growth and survival of small and medium-sized enterprises (SMEs). SMEs typically rely on external financing, and formal finance is often the preferred option due to lower interest rates, longer repayment periods, and greater legal protections. Formal finance includes bank loans, lines of credit, and other financial instruments that are extended by established financial institutions (Beck et al. 2006). In contrast, informal finance refers to financial transactions that occur outside the formal financial system and includes trade credit, microfinance, and personal savings (Ayyagari et al. 2011).

However, SMEs often face significant challenges when accessing formal credit due to high collateral requirements, short loan maturities, and restrictive loan covenants. As a result, they may turn to informal finance, which can be more accessible and flexible but comes with higher interest rates and fewer legal protections (Beck et al. 2006). The literature on SME finance has identified various firm-level and country-level factors that affect access to finance, including age, size, ownership dynamics, owner-manager characteristics, exporter orientation, strength of legal rights, depth of credit information, collateral inadequacy, high opaqueness, and market failures (Ayyagari et al. 2011).

To address the issue of access to finance for SMEs, this thesis examines three firm-level factors and two country-level factors across three empirical studies. The first study focuses on the impact of external audit, international standard certification, and government contracts on SMEs' access to finance. The second and third studies analyze, respectively, the influence of the adoption of the International Financial Reporting Standards for SMEs, and the enactment of interest rate cap policies on SMEs' access to finance. By examining these factors, the thesis aims to contribute to a better understanding of the obstacles facing SMEs in accessing finance and proposes solutions for overcoming them. Specifically, the findings highlight the importance of high-quality accounting practices, the need for policy reform to reduce collateral requirements and improve legal frameworks, and the potential unintended consequences of interest rate caps on SME financing.

1.2 Problem Statement

Small and medium-sized enterprises (SMEs) play a critical role in economic growth and job creation, but their access to external finance is often restricted because of high information asymmetry and high interest rates (Ayyagari et al., 2007; Beck et al., 2008). The first project

of this study examines the impact of externally audited financial statements and international standards certification on the quality and reliability of SME financial information and their effect on access to finance. Previous studies have shown that these practices improve SME creditworthiness and access to finance (Beck et al., 2014; Carretta et al., 2019; García-Teruel and Martínez-Solano, 2010). Furthermore, the chapter investigates the impact of government contracts on SME finance. While government procurement policies can boost SME growth and credit access, the complex bidding process and delayed payment by the government can hinder SMEs' access to finance (Loader, 2005; Flynn and Davis, 2016). Previous studies have demonstrated that SME participation in government procurement can enhance their access to finance, but that the bidding process and payment delays can limit their finance access (Aterido et al., 2011; Ferrando et al., 2014).

The second project examines whether the adoption of globally accepted accounting standards, such as the International Financial Reporting Standard (IFRS) for SMEs, can enhance access to finance by improving the quality of SME financial information. Previous research has indicated that the adoption of IFRS for SMEs can enhance SMEs' creditworthiness and access to finance by improving the comparability and quality of financial information (Carretta et al., 2019; Weiß et al., 2015; Kaya and Ozyapici, 2017).

Lastly, high interest rates and restrictive loan covenants contribute to the SME finance problem. The third project of this study examines the effectiveness of interest rate cap policies in controlling credit markets and their impact on SME access to finance. Prior research has shown that interest rate caps can lower borrowing costs for SMEs and improve their access to finance (Beck et al., 2014; Van der Weide and Islam, 2018; Rono, 2018). However, these policies can also constrain credit markets and limit the availability of funds for SMEs, creating tensions in the literature about their overall impact (Ombati et al., 2017).

Overall, this thesis provides insights into the factors that hinder SME access to finance and proposes solutions to improve access to finance. The study explores the impact of information asymmetry, government procurement contracts, and high-interest-rate environments on SME finance, with the goal of enhancing SME competitiveness and thus contributing to economic growth (Schiffer and Weder, 2001; Ayyagari et al., 2011).

1.3 Research Questions

The primary objective of this thesis, as outlined in Section 1.2, is to investigate the impact of three firm-level factors and two country-level factors on the accessibility of finance for SMEs. This study is presented in three separate empirical chapters, each focusing on a specific research question.

The first paper aims to answer the following research questions:

1. What is the effect of external audit on SME finance?
2. What is the effect of international standard certification (ISC) on SME finance?
3. What is the effect of government contracts on SME finance?

By examining these factors, the study seeks to provide insights into how external audit, ISC, and government contracts affect SMEs' access to finance.

The second paper addresses the research question:

4. What is the effect of the international financial reporting standard for SME (IFRS for SME) on SME finance)?

The study seeks to explore how the adoption of the IFRS for SME can improve the quality of financial information provided by SMEs and, in turn, enhance their access to finance.

Finally, the third paper investigates the research question:

5. What is the effect of interest rate cap (IRC) policies on SME finance?

The study aims to evaluate the effectiveness of IRC policies in controlling credit markets and how they impact SMEs' ability to access finance.

Overall, this thesis contributes to further understanding of the factors that influence SMEs' access to finance, providing practical insights for policymakers, SME owners, and financial institutions.

1.4 Research Contributions

This thesis offers several significant contributions to aid understanding of SME finance by examining the effects of three firm-level factors and two country-level factors on SMEs' access to finance across three empirical studies. These contributions help to address various gaps in

the extant literature, extend our knowledge of the field, and address the relevance of the study (Beck and Demirgüç-Kunt, 2006; Schiffer and Weder, 2001).

First, addressing a population gap in the literature, this study analyzes a comprehensive cross-sectional dataset covering over 150 countries across six geographic regions to investigate the impact of external audits on SME finance (Han et al., 2019a; Han et al., 2019b). The findings reveal a positive relationship between external audits and SME access to finance, which adds to the existing literature that has largely focused on case studies conducted in individual countries (García-Teruel and Martínez-Solano, 2010; Petersen and Rajan, 1994).

Second, the research addresses a perspective gap by examining the influence of international standard certification (ISC) on SME finance. The study finds that obtaining ISC improves SMEs' access to finance, which is a more specific focus compared to the predominantly positive relationship between ISC acquisition and firm trade and performance documented in previous literature (Goedhuys and Sleuwaegen, 2010; Grajek and Blind, 2010; Henson and Jaffee, 2008; Zeng et al., 2007). Third, this study investigates the effect of government contracts on SME finance, contributing to the literature by examining a relatively underexplored aspect. The results reveal that government contracts have a positive impact on SME finance. However, potential challenges, such as complexities and inefficiencies in the bidding process and delayed payments, could hinder access to credit (Flynn and Davis, 2016). While this research may not be the first to explore the topic, it adds valuable insights to the existing literature on the relationship between government contracts and access to finance (Loader, 2005; Yalcin et al., 2018).

Fourth, the study analyzes the impact of the International Financial Reporting Standard for SMEs (IFRS for SME) on demand-side credit measures, specifically the financing of working and fixed capital of SMEs through bank and trade credit (Adegbite et al., 2020a; Adegbite et al., 2020b). The findings reveal a positive effect of IFRS for SME adoption on SME finance, addressing a perspective gap in the literature that has primarily focused on the adoption of IFRS for SME by countries and the supply-side factors influencing this adoption (Kaya and Ozyapici, 2017; Ramanna and Sletten, 2014). Finally, the research contributes to the literature by examining the demand-side impact of interest rate cap (IRC) policies on SME finance, an area that has been less explored (Ayyagari et al., 2017). The study uncovers that IRC policies negatively impact SME access to finance, contradicting the policy's intention (Rono, 2018; Ombati et al., 2017). This research may not be the first to investigate the topic, but it adds

valuable insights to the existing literature on the relationship between IRC policies and SME finance.

In summary, the findings of this thesis have significant implications for academics, SME practitioners, and policymakers, contributing to practical policy discussions on how to enhance access to finance for SMEs, a pressing issue faced by SMEs globally (Ayyagari et al., 2011; Beck et al., 2008).

1.5 Definition of Terms

SME

The definition of SMEs is a complex issue due to the lack of a universal definition, resulting in inconsistent classification criteria across different countries and organizations. In addition, the distinction between formal and informal SMEs is also important. Formal SMEs are those that are registered with the government and have access to formal finance, while informal SMEs are those that are not registered and may rely on informal sources of finance (Beck et al., 2005). For instance, the European Union defines SMEs based on the number of employees, turnover, and balance sheet totals, while other countries such as China, the United States, Nigeria, and Kenya have their own criteria for classification[1] (OECD, 2005). In addition, the International Finance Corporation (IFC) and the World Bank Enterprise Survey (WBES) have their own definitions, which incorporate various thresholds for employee headcount, turnover, total assets, and loan sizes at origination (Beck et al., 2005; Demirguc-Kunt et al., 2008).

In order to address the varying definitions of small and medium-sized enterprises (SMEs), this thesis adopts the classification utilized in the WBES for the purpose of consistency and alignment with previous literature (Ayyagari et al. 2011). According to the WBES framework, micro-enterprises are defined as businesses with fewer than 10 employees, small enterprises as those employing between 10 and 49 individuals, and medium-sized enterprises as companies with a workforce ranging from 50 to 249 employees (World Bank, 2021). This definition is based on a consistent set of thresholds and is used in a large number of countries, making it suitable for comparative analysis across different jurisdictions. However, it is important to acknowledge that the use of different definitions across prior studies can have implications for

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[1] For more on the definitions see Zhan et al. (2016a): https://unctad.org/system/files/official-document/diaeed2013d5_en.pdf

the conclusions drawn, and this issue as discussed in previous studies (Healy and Palepu, 2001; Daske et al., 2008).

With respect to agency factors that impact SMEs, existing research highlights the significance of three key determinants in influencing firm performance: the proportion of managerial ownership, the degree of board independence, and the extent of external ownership (Demsetz and Lehn, 1985; Shleifer and Vishny, 1986; McConnell and Servaes, 1990). These factors play a crucial role in shaping the governance structure and decision-making processes within small and medium-sized enterprises. However, subsidiary relationships with foreign multinational enterprises may not be as relevant for SMEs due to their smaller size and limited resources (Ramamurti and Singh, 2009). Additionally, research on internationalization among SMEs has found that they are less likely to engage in foreign activities compared to larger firms (Bell et al., 2003; Lu and Beamish, 2006), and are less likely to have foreign institutional investors (Da Rin et al., 2015). Regarding the relevance of financial markets for SMEs, research has found that financial market development can be a significant factor in SME access to external finance (Beck et al., 2005; Demirguc-Kunt and Maksimovic, 2002). However, the specific impact of financial markets on SME performance and financing remains a topic of debate (Cressy, 2006; Degryse and Van Hove, 2006). Segmental reporting, which involves disclosing financial and operational information about specific business segments, may be less relevant for SMEs due to their smaller size and less complex organizational structure (Napier and Willekens, 2013). Additionally, research has found mixed findings regarding the influence of ownership and accounting quality, which may be due to different definitions of ownership concentration (La Porta et al., 1999; Piotroski and Wong, 2010).

In conclusion, while the definition of SMEs remains a complex issue, the adoption of a consistent framework such as the WBES definitions can aid in comparative analysis across different jurisdictions. Agency factors, internationalization, financial market development, segmental reporting, and ownership concentration are all important considerations when examining SME performance and financing.

Measures of SME Finance

This thesis uses two primary measures of SME finance to examine the impact of different factors on SMEs' access to finance. In the second chapter, an ordinal measure of access to finance is used as the outcome variable, ranging from 0 to 5, indicating the severity of access to finance as an obstacle to an SME. This variable is constructed from the WBES question K30,

which has been utilized in previous studies to assess the severity of SME credit constraints (Asiedu et al. 2013; Asterido et al. 2011; Mertzanis 2017).

Additionally, an objective measure of SME credit constraint is employed, based on previous studies (Chavez 2017; Fowowe 2017; Kuntchev et al. 2013). This measure categorizes an SME into one of four categories: "not credit constrained" (NCC), "maybe credit constrained" (MCC), "partially credit constrained" (PCC), and "fully credit constrained" (FCC). The credit constraint measure is derived from a set of questions in the WBES survey, covering various sources of external finance, loan applications and approvals, and reasons for not applying for a loan.

Figure 1.1 illustrates the sequence of questions used to construct the credit constraint measure, which serves as an alternative measure of access to finance. The measure categorizes SMEs into one of four groups based on their access to external finance. The credit constraint measure provides an objective measure of SME credit constraints and helps reduce perception bias from respondents when using a subjective measure (Chavez 2017; Fowowe 2017; Kuntchev et al. 2013).
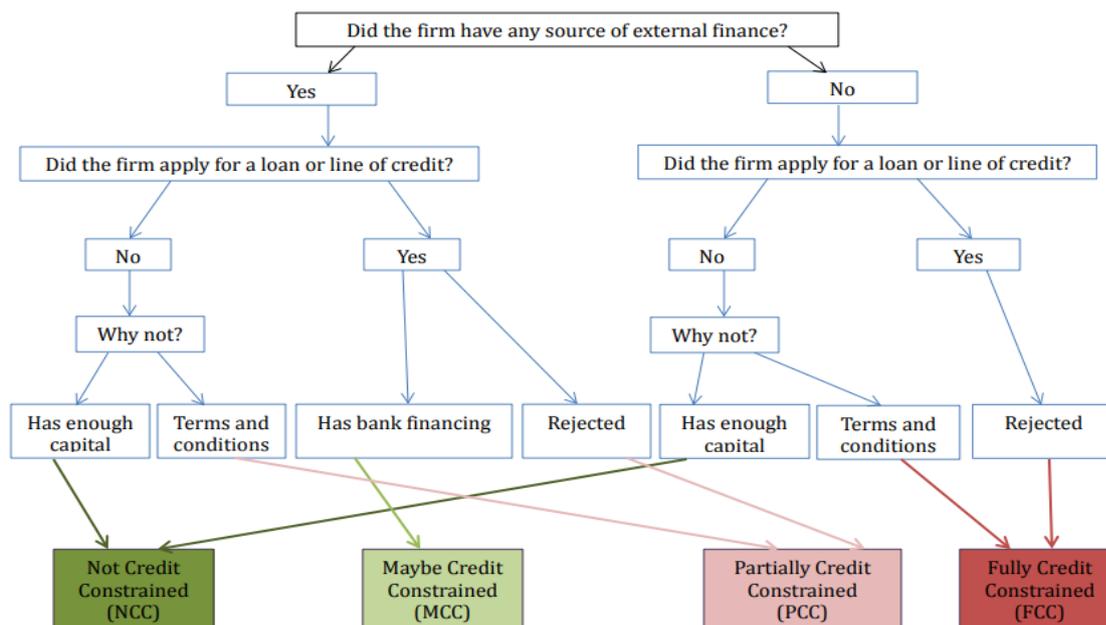
Figure 1.1: Credit constraint flow chart (Source: Kuntchev et al. 2013)

In the third chapter, the financing of working and fixed capital is used as proxies for SME finance, incorporating three measures: financing of working capital through banks, financing of working capital through trade credit, and financing of fixed capital through banks. These

continuous variables indicate the extent to which SMEs can access finance for their operations and align with previous studies (Briozzo and Albanese 2020).

Two alternative dependent variables are employed in this study. The first, active credit, is generated from WBES question K8, asking whether the establishment has a line of credit or loan from a financial institution. The second dependent variable, overdraft facility, is derived from WBES question K7, asking whether the establishment has an overdraft facility. These measures have been used in previous studies to proxy for SME access to finance (Chen et al. 2014; Du and Girma 2014; Nenova and Haralampieva 2015). The utilization of these measures allows for a comprehensive analysis of the various types of credit available to SMEs and the extent to which they can access them.

External audit

External audit is an independent and systematic examination of a company's financial statements, accounting records, and internal control systems by an auditor to provide an opinion on the fairness of the financial statements (Healy and Palepu, 2001). External audits are conducted by independent third-party auditors who are not employees of the company being audited and can provide either voluntary or statutory audits. Voluntary audits are conducted at the discretion of the company and can be used to provide additional assurance to stakeholders, while statutory audits are mandatory and required by law or regulation.

The demand for external audits may be driven by various factors, such as legal requirements, economic power of credit providers, or legitimacy theory arguments (Daske et al., 2008). Legal requirements for audits vary by country and by company size. For instance, in the UK, small businesses with assets of less than £3,260,000, an annual turnover of less than £6,500,000, and fewer than 50 employees are exempted from statutory audits (BEIS, 2017). In contrast, in Europe, most private firms, apart from microenterprises, must conduct a statutory audit (Vanstraelen and Schelleman, 2017).

It is important to distinguish between different types of audits, including external audits, internal audits, voluntary audits, and statutory audits. External audits are conducted by third-party consultants outside the firm's structure, while internal audits are performed by auditors employed within a firm. Voluntary audits are conducted at the discretion of the company, while statutory audits are mandatory and required by law or regulation. In most countries, SMEs are

not required to disclose their financial statements or have them audited (Perera and Chand, 2015b).

The demand for audits among private firms is influenced by various factors, such as firm size, operational complexity, financing needs, and the quality of the institutions in the country in which they operate (Vanstraelen and Schelleman, 2017). However, the impact of external audits on financial reporting quality and the degree of information asymmetry is not clear-cut. For example, some studies have linked external audits to reduced information asymmetry, while other researchers have found that external audits have limited impact on financial reporting quality (Francis and Ke, 2006; DeFond and Zhang, 2014).

Despite the limitations of external audits, advocates contend that they offer various benefits to private firms (Briozzo and Albanese, 2020; Clatworthy and Peel, 2013; Downing and Langli, 2019; Palazuelos et al., 2018). Firstly, auditors can provide recommendations on restructuring cost centres and enhancing the reporting framework (Baylis et al., 2017). Secondly, SMEs that employ an external auditor have their loan applications reviewed more favourably by credit officers (Palazuelos et al., 2018), thus providing assurance to lenders, creditors, and other users of SMEs' financial statements about the credibility of their accounts. Thirdly, private firms with audited financial statements tend to have higher credit quality ratings. For instance, in the UK, firms that voluntarily chose to audit their financial statements after being exempt from statutory audits had higher credit ratings compared to those that dropped the audits (Dedman and Kausar, 2012). Similarly, Norwegian firms that opted out of mandatory audits were associated with lower compliance with specific requirements in tax and accounting regulations, measured using a compliance quality score (Downing and Langli, 2019).

For the purposes of this study, externally audited firms refer to those that voluntarily subject themselves to a financial audit. The proxy for external audit used in the study is generated from the WBES survey question: "Were the financial statements of this firm checked and certified by an external auditor in the last financial year?"

ISC

International standard certification (ISC) refers to a certificate issued by international standard-setting bodies, with the International Organization for Standardization (ISO) being the most popular (Fikru, 2014). Some common ISOs include ISO 9000 on quality management systems, ISO 14000 on environmental management systems, and ISO 22000 on food safety management

systems (ISO, 2021). Firms receive ISC after a third-party accredited body performs an external audit and issues a satisfactory compliance analysis. Previous research has shown that acquisition of ISC is linked with productivity enhancement, reduction in transaction costs, and higher sales (Goedhuys and Sleuwaegen, 2016), as well as SME innovation and higher access to finance (Ullah, 2020). Furthermore, the use of ISC is becoming increasingly relevant in the context of global value chains, where firms must adhere to specific standards to participate in international trade (Humphrey and Schmitz, 2002), underscoring the importance of investigating the impact of ISC on SME access to finance.

Acquiring an ISC can reduce information asymmetry between firms and their creditors, potentially improving SME access to finance (Ferrando and Mulier, 2016). This highlights the significance of examining the impact of ISC on SME finance. The proxy for ISC used in this study is based on the WBES survey question: "Does this establishment have an internationally recognized quality certification?" This definition is consistent with prior literature (Goedhuys and Sleuwaegen, 2013; Ullah, 2020).

Government contracts

The relationship between SME access to finance and government contracts is an area that has received limited attention in previous studies. For the purposes of the thesis, government contracts refer to situations where the government acts as a customer for goods and services provided by SMEs. This definition is consistent with that used in the analysis of the relationship between government procurement and financial statement certification in the WBES (Hope et al., 2021). The proxy variable for government contracts, as used in Hope et al. (2021), is generated from the following WBES survey question: "Did this establishment secure a government contract in the last 12 months?"

Government contracts may have a positive impact on SME access to finance, as they serve as collateral for SME loans, enhance the firm's reputation, and reduce information asymmetry between the SME and lenders (Aterido et al., 2011; Brusco and Panunzi, 2005; Jappelli et al., 2013). However, the positive effects of government contracts on SMEs are contingent on the efficiency of the public procurement system, the transparency of the bidding process, and the promptness of payments (Kaufmann et al., 2011; Reuter et al., 2017). Moreover, the quality of public institutions, such as control of corruption, rule of law, and regulatory quality, is essential for the successful implementation of government contracts in developing countries (Kaufmann et al., 2011).

In contrast, some studies suggest that government contracts may hinder SME access to finance (Jappelli et al., 2013). The bureaucratic procedures involved in public procurement, as well as the high requirements for quality and certification, may be costly for SMEs and, thus, impede their access to finance (Aterido et al., 2011). Furthermore, government contracts may reduce SMEs' incentives to invest in innovation and technology because they become reliant on public procurement rather than focusing on their core business operations (Briozzo and Albanese, 2020).

Therefore, the relationship between government contracts and SME access to finance is complex and context specific. In the thesis, the effect of government contracts on SME access to finance is investigated using the proxy variable generated from the WBES survey question on government contracts.

IFRS for SMEs

The IFRS for SME accounting standard was introduced by the International Accounting Standards Board (IASB) in 2009[2] to provide a simplified financial reporting framework for SMEs compared to the more complex full IFRS standards used by public companies (Perera and Chand, 2015a). The IFRS for SMEs comprises thirty-five sections and is available in twenty-seven languages. It requires fewer disclosures, and some accounting treatments are disallowed as compared to the full IFRS. For example, topics such as earnings per share, assets held for sale, and segment reporting are excluded from the IFRS for SME (Perera and Chand, 2015a). The IFRS for SMEs can help SMEs align their financial statements with international accounting standards and enhance the comparability of financial statements across different countries. Adoption of the IFRS for SME standard can positively influence the credibility and transparency of SME financial reporting and reduce information asymmetry between SMEs and external stakeholders, including creditors.

The distinction between IFRS adoption and convergence, IFRS for SMEs, and full IFRS is important to note. IFRS adoption is the process by which a country decides to adopt IFRS as its accounting standard, while IFRS convergence refers to the process by which a country seeks to align its existing accounting standards with IFRS (Choi and Meek, 2011). IFRS for SMEs is a separate standard from full IFRS, designed specifically for SMEs, with a focus on reducing

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[2] The IFRS for SME standard came into effect immediately after issue on 9th July 2009. For more see: https://www.ifrs.org/projects/completed-projects/2009/ifrs-for-smes-standard/

complexity and improving comparability of financial statements across different countries (Perera and Chand, 2015b). The IFRS for SMEs provides a simplified set of accounting standards that are more appropriate for the needs of SMEs, with fewer disclosures and some accounting treatments disallowed as compared to the full IFRS (Perera and Chand, 2015b).

Prior studies have examined the adoption and implementation of the IFRS for SMEs standard. Healy and Palepu (2001) investigated the implications of adopting IFRS for SMEs in Canada and concluded that it would lead to a reduction in information asymmetry between SMEs and external stakeholders. Daske et al. (2008) compared the disclosure requirements of different accounting standards for SMEs in the European Union and found that the IFRS for SMEs was the most comprehensive standard with respect to disclosure requirements.

This thesis employs three proxies for the IFRS for SME standard. Firstly, the binary variable of country adoption of the standard is used, indicating whether a country has adopted the IFRS for SME standard or not. This variable is developed using data from the IFRS Foundation website (IFRS Foundation, 2021b). Secondly, the variable IFRS for SME experience is used, which is calculated as the difference between the year of adoption and the year of the country survey. This variable has been used in previous studies (Cai et al., 2014; Houqe et al., 2012; Tawiah and Gyapong, 2021). Thirdly, the variable IFRS for SME mandate is introduced, which has not been previously used to the best of the author's knowledge. This variable refers to the extent to which the IFRS for SME standard is mandated in a country for the preparation of SME financial statements. The IFRS Foundation provides information on whether a country either allows (i.e., permits) or requires the use of the standard (IFRS Foundation, 2021).

The use of the IFRS for SME accounting standard is becoming increasingly relevant in the context of global value chains, where firms must adhere to specific accounting standards to participate in international trade (Humphrey and Schmitz, 2002). The IFRS for SME standard can help SMEs align their financial statements with international accounting standards and enhance the comparability of financial statements across different countries. Furthermore, adoption of the IFRS for SME standard can positively influence the credibility and transparency of SME financial reporting and reduce information asymmetry between SMEs and external stakeholders, including creditors (Xu et al., 2014).

In summary, the IFRS for SME standard is a simplified financial reporting framework for SMEs that can enhance the comparability of financial statements across different countries and reduce information asymmetry between SMEs and external stakeholders, including creditors.

Prior studies by Healy and Palepu (2001) and Daske et al. (2008) have shown the implications of adopting IFRS for SMEs in terms of reducing information asymmetry and comprehensive disclosure requirements, respectively. The three proxies employed in this study for the IFRS for SME standard allow for an analysis of the adoption, experience, and mandate of the standard in different countries.

Institutional quality

The governance indicators used to construct the institutional quality index are based on the Worldwide Governance Indicators (WGI) developed by the World Bank (Kaufmann et al. 2011). The six governance indicators are Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption. The WGI are based on a combination of data from various sources, including surveys, expert assessments, and public opinion polls (Kaufmann et al. 2011). The PCA method is used to reduce the six-dimensional index into a single composite index for use in the regression analysis. This approach is consistent with previous studies that have used a composite index of institutional quality to investigate the impact of institutional quality on various economic outcomes (Tawiah and Gyapong 2021; Tunyi et al. 2020)

Interest rate cap

The interest rates charged by banks depend on the creditworthiness of the borrower and the purpose of the financing (IMF 2021). However, market imperfections such as information asymmetry and imbalances between credit demand and supply can make risk assessment difficult (Facundo and Schmukler 2017a; Facundo and Schmukler 2017b). To prevent banks from exploiting savers and borrowers, governments may impose interest rate restrictions, such as interest rate caps/ceilings (IRC) on loans and deposit rate floors on savings accounts (Calice et al. 2020; Maimbo and Gallegos 2014). Interest rate caps/ceilings are the most common form of interest rate control in lending markets (Ferrari et al. 2018).

Interest rate caps/ceilings may have potential effects on SME access to finance. On the one hand, they may prevent banks from charging excessive interest rates and protect SMEs from financial exploitation (Beck et al. 2011). On the other hand, they may limit the supply of credit to SMEs by making it less attractive for banks to lend to them, especially those considered riskier (Calice et al. 2020a; Calice et al. 2020b). In addition, interest rate caps/ceilings may

encourage informal lending, which may not be subject to regulatory oversight and may expose SMEs to other risks (Beck et al. 2011).

The IRC variable is constructed from data obtained in 2019 through a survey on interest rate controls, known as the interest rate repression dataset (IRRD) (Calice et al. 2019). The World Bank Group conducted the survey to identify the formal interest rate controls in a sample of 108 countries and to gather information on the execution and features of the controls. The data, which also includes information on the limitation of non-interest rate fees, is available on the World Bank micro data library and is used in this study to examine the impact of non-interest rate fee limitations and interest rate caps on SME access to finance.

1.6 World Bank Enterprise Survey Data: Advantages and Limitations

1.6.1 Data Source and Access Protocol

The section discusses the types of datasets provided by the WBES, the period covered, the geographic regions surveyed, and the sector composition of SMEs. Additionally, the section highlights that the panel data used in chapter 4 is limited to four countries that have instituted IRC policies, and the standardized datasets used were made available in October 2021 and March 2022. The primary data used in the thesis is obtained from the WBES. To access the WBES data, researchers need to complete a data access protocol stating the intention of use and the affiliated research facility[3]. This protocol is necessary to protect the confidentiality of the respondents. The WBES has conducted surveys from 2006 to 2022 and represents approximately 180,000 firms in over 150 countries. The surveys cover 12 areas that identify factors affecting SME operations, including corruption, crime, finance, firm characteristics, gender, informality, infrastructure, performance, regulation and taxes, trade, and workforce.

The WBES provides two types of datasets: panel data with individual country data for each period surveyed, and a cross-sectional dataset that includes commonly asked questions and is updated with new surveys for cross-country comparisons. The standardized datasets used in the thesis were made available in October 2021 and March 2022. The latter dataset is a weakly balanced panel consisting of 174,297 observations from 152 countries in six geographic regions, covering the 2006 to 2021 period. A weakly balanced panel means that the surveys are not uniformly collected annually in surveyed countries, and there are few repeat

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[3] For the full WBES methodology see: https://www.enterprisesurveys.org/en/methodology.

observations available for the same firm in multiple surveys. This may limit the ability to analyze changes in firm-level variables over time.

The observations in the survey are ranked by the regions with the highest number of surveyed SMEs: Europe and Central Asia (32%), Sub-Saharan Africa (20%), Latin America and the Caribbean (19%), East Asia and the Pacific (10%), South Asia Region (10%), and the Middle East and North Africa (9%). The number of surveys collected per country in the dataset ranges from one to four. Forty-five countries were surveyed thrice, fifty-one countries were surveyed twice, and fifty-three countries were surveyed once in the dataset used. The SMEs are stratified by sector: 54.67% of the firms are in the manufacturing sector while 45.33% are in the services sector.

For robustness checks in chapter 4, the panel data used relate to four countries that have instituted IRC policies: the Dominican Republic, El-Salvador, Kenya, and Zambia. In addition to the standardized datasets, individual country surveys are also available, but they include additional country-specific data and limit cross-country comparability. Prior studies have used WBES data to analyze various factors that affect SMEs' growth and productivity, such as gender, determinants and financing patterns, external audit, and ISC.

1.6.2 Data Advantages and Limitations

The use of secondary data sources, such as the WBES data, has several advantages (Vartanian 2010a; Vartanian 2010b). First, it is cost-efficient and reduces the time constraints associated with collecting primary data in multiple countries. Second, a wide range of topics are covered by secondary data sources, including the 12 areas identified in the WBES surveys. This means that more variables are available for analysis, reducing the need to combine multiple datasets. Third, the WBES is conducted by professionals and used in several academic and policy research papers, demonstrating the reliability and confidence in the data. Fourth, the WBES data can be downloaded in an accessible Stata format, which makes it easier to analyze. The comprehensive data also reduces the likelihood of errors that could be introduced by merging individual country data files.

However, there are limitations associated with using the WBES data that are not unique to other secondary datasets (Vartanian 2010a; Vartanian 2010b). One key limitation is a lack of control over the framing of the survey questions. Some of the wording used in the WBES surveys is vague, and terms such as "external audit" and "government contracts" are not well

defined. To mitigate this, the author takes care not to overgeneralize the results when interpreting the data. Another limitation is a lack of control over the measures of outcome variables and variables of interest. For example, the access to finance measure is subjective and perception based. To address this, the author uses several proxies for SME finance that are objective, such as credit constraints and measures of financing for working and fixed capital, as commonly used in previous studies (Ayyagari et al. 2011b; Beck et al. 2006). Finally, it is difficult to evaluate the responses to close-ended questions further. For example, the author would have liked more information on the type of ISC that a firm has. However, the responses provided only included country-level quality standards and not internationally recognized standards, as noted in previous studies (Ayyagari et al. 2011b). Therefore, the author takes care when interpreting the results and limits the data used to the responses that match the criteria for ISC.

1.7 Structure of the Thesis

The structure of this thesis is organized into five chapters to provide a comprehensive investigation of the critical issues facing SME finance. Chapter 1 serves as an introduction to the research, providing a background, problem statement, research questions, and study contributions. This chapter also includes key term definitions and outlines the research boundaries to ensure a clear understanding of the research scope.

Chapters 2, 3, and 4 present three empirical studies that investigate the impact of external audit, international standard certification, government contracts, IFRS for SMEs, institutional quality, and interest rate caps on SME finance. Each empirical chapter includes tables and figures to provide a detailed analysis of the research results. The placement of the appendices and bibliography at the end of the thesis ensures that the focus remains on the research analysis.

Chapter 5 presents a summary of the major findings from the three studies, highlighting the relevant policy debates and implications. This section also identifies the limitations of the studies and provides directions for future research, offering valuable insights for future researchers in this field.

Overall, this thesis makes a significant contribution to the understanding of SME finance, with practical implications for policymakers, financial institutions, and SMEs. The empirical results offer insights for policymakers and financial institutions in developing appropriate policies to

support SME finance, while SMEs can benefit from the research recommendations in improving their financial management and decision-making processes.

Chapter 2

The Impact of External Audit, International Standard Certification, and Government Contracts on SME Financing Accessibility: An Empirical Study.

"External audit and international standard certification (ISC) are effective strategies to overcome the challenges that SMEs face in accessing finance, particularly in developing countries. By providing credible and reliable financial information, these measures can help reduce information asymmetry and increase the confidence of lenders and investors, thus improving the SMEs' ability to obtain financing. Policymakers and governments should consider incentivizing SMEs to adopt ISC and external audits, which can promote SME financial growth and development and contribute to the overall economic development of the country."

(Adapted from; Ayyagari et al. 2011, Quartey et al. 2017, and Zhan et al. 2016a)

2.0 Introduction

Small and medium-sized enterprises (SMEs) are essential for economic growth and development worldwide, providing employment opportunities and contributing to GDP. Access to finance is a critical issue for SMEs, as it enables them to invest, expand, and create jobs. However, SMEs often face significant obstacles in accessing finance, which can hamper their growth and survival. These obstacles include, but are not limited to, credit constraints, collateral requirements, and high-interest rates (Beck et al. 2014; Ayyagari et al. 2018). To address these challenges, policymakers and researchers have focused on identifying factors that enable SMEs to access finance. One such factor is the role of corporate governance mechanisms, including external audit, international standards certification (ISC), and government contracts. However, the impact of these mechanisms on SME finance may vary depending on the institutional and regional context. Thus, it is important to investigate these mechanisms' effects across different regions and institutional settings.

This chapter aims to examine the impact of external audit, ISC, and government contracts on SME finance across different institutional and regional contexts. Specifically, this study aims to test the following hypotheses: 1) external audit reduces SMEs' access to finance obstacles., 2) ISC reduces SMEs' access to finance obstacles, and 3) SMEs that engage in government procurement contracts will face higher obstacles to accessing finance compared to those that do not engage in such contracts. The study utilizes a cross-sectional dataset consisting of 165,802 firm-level observations from 142 countries, collected from the World Bank Enterprise Survey (WBES) database between 2006 and 2021.

The chapter is structured as follows: first, the literature review presents the theoretical framework and previous empirical studies on the impact of corporate governance mechanisms on SME finance. Second, the methodology section describes the data and empirical approach utilized in this study. Third, the results section presents the empirical findings on the impact of external audit, ISC, and government contracts on SME finance across different institutional and regional contexts. Fourth, the robustness checks examine the robustness of the main results. Fifth, the discussion section interprets the results and discusses the policy implications. Finally, the conclusion summarizes the main findings and suggests future research directions.

2.1 Literature Review

Access to finance is a significant challenge for small and medium-sized enterprises (SMEs) that often hinders their growth (Beck et al., 2006). Bank financing, especially in developing countries, remains the most common source of credit for SMEs. Along with bank finance, firms with inadequate collateralizable assets and those located in countries with underdeveloped financial markets often resort to informal credit sources such as funds from family, friends, and trade credit (Facundo and Schmukler, 2017). The availability and demand for credit, particularly from banks, are influenced by the level of economic development (Johnson et al., 2002). Moreover, the strength of creditor and property rights significantly affects the supply and demand for credit, with SMEs in countries with weaker legal frameworks experiencing higher credit constraints (Kersten et al., 2017). State-owned banks often play a critical role in many of these countries. However, they tend to focus on maximizing social returns rather than fostering growth in key sectors such as SMEs (Levy-Yeyati et al., 2004).

This chapter investigates the effect of external audit, international standard certification (ISC), and government contracts on the accessibility of finance for SMEs. The following sections provide a review of the existing literature and develop the research hypothesis.

2.1.1 The role of external audit in improving SME access to finance.

Access to finance is a significant challenge for the growth of SMEs (Beck et al., 2006). In many countries, limited liability firms are not required to disclose audited financial statements, resulting in financial statements with low information value (Minnis and Shroff, 2017). Consequently, such financial information is often viewed as unreliable, particularly by banks that prefer to evaluate creditworthiness based on credible accounts. SMEs are often seen as opaque, making it challenging for lenders to assess risk (Facundo and Schmukler, 2017).

The extant literature suggests that external audit reduces information asymmetry and improves access to credit for SMEs (Briozzo and Albanese, 2020; Palazuelos et al., 2018). However, there is heterogeneity in financial reporting among private firms, which depends on the specific business context and ownership structure (Hope and Vyas, 2017). Firms' demand for audit depends on the size, ownership, and capital structure of the company (Chow, 1982).

Despite the clear link between external audit and credit supply for SMEs, the sector continues to face challenges related to the lack of standardization of accounting and auditing standards, and the shortage of professionals with knowledge of private firm activity (Zhan et al., 2016a). Moreover, external audit regulations for SME financial statements vary between countries, leading to inconsistencies in the literature. Several studies have identified a positive association between audited SMEs and greater access to credit (Briozzo and Albanese, 2020; Palazuelos et al., 2018; García-Teruel and Martínez-Solano, 2010). For example, Briozzo and Albanese (2020) find that firms that voluntarily employ external audit services have greater access to bank and trade credit, as well as supplier-financed working capital. Similarly, using Spanish interview data from credit officers, Palazuelos et al. (2018) note that credit officers are more willing to lend to firms with externally audited financial statements.

Conversely, other studies have argued that the costs associated with external audits may outweigh the benefits for SMEs, particularly in countries with weak institutional environments (Van Tendeloo and Vanstraelen, 2008; Han et al., 2019a). These studies call for a nuanced understanding of the relationship between external audits and SME access to finance. Given the varying perspectives in the literature, this study proposes Hypothesis 2.1: *SMEs that engage the services of external auditors will face lower obstacles to accessing finance compared to those that do not.*

2.1.2 The role of International Standards Certification.

The increasing global awareness of environmental sustainability and the growing demand for sustainable products and services have highlighted the importance of SMEs in achieving sustainable production. One way for SMEs to demonstrate their commitment to sustainability and credibility is by obtaining quality accreditation through international standard certification (ISC), such as those provided by the International Organization for Standardization (ISO) (Goedhuys and Sleuwaegen, 2016; Zeng et al., 2007). ISC is voluntary but influenced by industry demand, external pressures, and the need for legitimacy (Delmas and Montiel, 2009). Previous studies have identified several benefits that SMEs can realize by obtaining ISC.

Firstly, the standards can act as signals of quality and improve trade (NIST, 2016; Henson and Jaffee, 2008). Secondly, ISC generates extra revenue for countries that are major exporters, including intellectual rights (Hogan et al., 2015). Thirdly, ISC is associated with an improvement in firm efficiency, reduction in transaction costs in international markets, and a

lower reliance on informal sources of finance (Goedhuys and Sleuwaegen, 2013; Fikru, 2014; Ullah, 2020a; Ullah, 2020b). Finally, ISC provides investors with non-financial information, which helps reduce information asymmetry between SMEs and lenders (Terlaak and King, 2006; Ullah, 2020b).

However, one criticism against ISC is the high costs associated with certification, especially if there are external audits prior to certification, which may outweigh the financial benefits (Lamin and Livanis, 2020). Despite this, the benefits of ISC are associated with higher equity and bank credit for certified firms compared to uncertified firms (Fikru, 2014; Ullah, 2020a; Ullah, 2020b). Given the potential for ISC to increase firm efficiency, productivity, sales, innovation, and act as signals of quality, thereby reducing informational asymmetry with lenders, the second hypothesis can be stated as: *Hypothesis 2.2: SMEs that have ISCs will face lower obstacles to accessing finance compared to those that do not have ISCs.*

2.1.3 Government Contracts: Facilitating or Hindering SME Financing Accessibility?

Government spending on public procurement programs constitutes a significant share of the world's gross domestic product, ranging from 10-30 percent (Nielsen 2018). A World Bank report from 2017 revealed that 43 percent of 180 countries surveyed had implemented policies aimed at facilitating SME access to government contracts (World Bank 2017). Many countries have established quotas for SME participation in public procurement, such as China, which set aside 33 percent of its public procurement contracts for SMEs in 2012 (ADB 2012), and the UK's HMRC, which dedicated approximately one-third of its £1,605,000 budget to SMEs (HMRC 2022). Such preferential policies offer direct and indirect benefits to local SMEs, including enhanced company valuation, tax benefits, and improved access to bank credit (Claessens et al. 2008; Cull et al. 2015; Wu et al. 2012).

Nonetheless, there are significant challenges associated with preferential SME public procurement schemes that can limit their effectiveness (Loader 2015). In some cases, such policies can be perceived as discriminatory and may not be cost-effective compared to competitive bidding, particularly when foreign firms are disadvantaged (Flynn and Davis 2016). Moreover, procurement scheme stipulations can be restrictive, such as requirements that successful bidders demonstrate prior contract fulfilment, which can limit the number of eligible applicants, particularly since most SMEs are small and inexperienced (Veronica et al. 2020). Additionally, larger corporations may form small subsidiaries to circumvent the size

requirements, rendering the policies less effective (Aterido et al. 2011). Furthermore, the application process is often complex, lengthy, and costly, and government remittance of payments can be delayed by months, further limiting the attractiveness of these contracts (Loader 2005). Finally, political connections can negatively impact the public procurement process, especially in countries with weak institutional quality characterized by high corruption, low accountability, and lack of transparency (Faccio 2006).

The relationship between government contracting and SME financing accessibility is complex and multifaceted, with some research suggesting that SMEs that win government contracts may gain valuable financial resources, including bank credit, which may spur their growth and development (Fossen and Steiner 2019), while others argue that winning government contracts can have negative effects on SMEs' access to finance (Cull et al. 2015). Moreover, political connections, which can be a determining factor in winning government contracts, may have a negative impact on SMEs' access to finance due to the associated informational asymmetry (Habib et al. 2018).

Given the conflicting arguments in the literature and the limited research on the relationship between government contracting and access to finance, this study aims to bridge the gap by examining the impact of government procurement contracts on SME financing accessibility. Therefore, I formulate the third hypothesis as: *Hypothesis 2.3: SMEs that engage in government procurement contracts will face higher obstacles to accessing finance compared to those that do not engage in such contracts.*

2.2 Data and Variable Definitions

2.2.1 Data.

The primary dataset utilized in this study was published by the World Bank in October 2021 (World Bank Enterprise Surveys, 2022). To control for heterogeneity across countries, additional country-specific data were obtained from the World Bank's Financial Development database. This database includes the financial development index (FDI) and institutional quality, developed from six governance indicators from the World Governance Indicators (WGI) (Kaufmann et al. 2011). The corruption perception index (CPI) from Transparency International (2021) was also used as a control variable to account for the effect of corruption on access to finance for SMEs. The FDI measures the level of financial intermediation, the size of financial institutions, and the efficiency of financial markets in a country (World Bank,

2022). The institutional quality variable, generated through dimensionality reduction from the six WGI dimensions, measures the effectiveness of government institutions and their ability to enforce contracts (World Bank, 2022). The CPI measures the perceived level of corruption in a country's public sector and is based on expert assessments and business surveys (Transparency International, 2021).

The World Bank Enterprise Surveys (WBES) provide a rich source of information on SMEs and access to finance in various countries. The dataset includes information on the characteristics of SMEs, including their size, age, and ownership structure, as well as information on the financing methods used by SMEs, such as bank loans, trade credit, and leasing. The dataset covers various countries across different regions, including Sub-Saharan Africa, Asia, Europe, Latin America, and the Middle East. The surveys are conducted on a regular basis and are designed to capture the experiences of firms in the private sector, including SMEs. The data in this study are cross-sectional, with information collected from the surveys conducted in various countries at different times. For further clarification on the variables of interest and sources of data, please refer to sections 1.5 and 1.6, respectively.

2.2.2 Variables definitions

The objective of this study is to investigate the impact of external audit, institutional strengthening programs, and government contracts on SMEs' access to finance. The dependent variable is defined as access to finance, which is measured as an ordinal variable ranging from 0 to 4, with higher values indicating greater difficulty in obtaining finance. Credit constraint is also employed as a robustness check to ensure the validity of the results.

The study includes several firm-level variables to control for heterogeneity and their impact on SME performance. One such variable is business legal status, which has been found to be a crucial factor in SME access to finance. A study by Klapper et al. (2006) found that SMEs registered as limited liability companies have a greater likelihood of accessing external finance than those that are not. Furthermore, SMEs with a higher legal status are more likely to have formal financial statements, which can further enhance their access to finance. Similarly, Asongu (2014) found that SMEs with a formal legal status are more likely to receive credit from banks than those without. These studies highlight the importance of business legal status in determining SMEs' access to finance and their overall performance. Therefore, the inclusion of business legal status as a control variable in studies on SME finance is crucial. By doing so,

researchers can better identify the specific impacts of other variables on SME performance and access to finance. The other firm-level control variables include size of the SME, years of experience of top managers, business legal status, ownership dynamics, and the perception of corruption in a country.

Institutional factors, such as the legal framework, infrastructural development, political stability, and level of economic development, also influence SMEs' access to finance. Therefore, three country-level variables, including institutional quality (IQ), the corruption perception index (CPI), and the index of financial development (FD), are used to control for these factors. The IQ variable is constructed using the World Governance Indicators dataset, which measures institutional quality in terms of voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption. The CPI variable measures public sector corruption perception and is obtained from Transparency International. The FD variable represents financial market depth, access, and efficiency and is obtained from the World Bank's Financial Development database. All continuous variables are standardized to enable comparisons, and long averages are used for the country variables during the study period of 2006-2020.

2.3 Research Methodology

To properly analyze the dependent variables, which are ordered and ranked, an ordered Probit regression model is utilized as it is the most suitable model for ordinal outcomes according to previous literature (Borooah 2002; Cameron and Trivedi 2009). Similar to previous studies that have examined the effects of SMEs' access to credit using the WBES dataset (Asiedu et al. 2013; Kuntchev et al. 2013), the statistical software package Stata is used for the analysis.

The baseline model is estimated using Eq. 2.1, as specified below.

Equation 2.1 Baseline model

$finance\ access\ obstacles_{ij,t} = Legal\_status_{i,j,t} + Female\_Ownership_{i,j,t} + Foreign\_Ownership_{i,j,t} + Ownership\_Concetntration_{i,j,t} + Subsidiary\_status_{i,j,t} + Size_{i,j,t} + Mgr\_exp_{i,j,t} + Cpt\_percpn_{i,j,t} + IQ_j + CPI_j + FD_j + \acute{e}_{i,j,t}$ (Eq.2.1)

Where, *finance access obstacle* is the dependent variable in this study and is measured on a five-point Likert-type scale, ranging from 0 to 4, with 0 indicating no obstacle and 4 indicating a very severe obstacle to the firm's operations in accessing finance. The independent variables include legal status, which is measured using six dummy variables: publicly traded (used as

the reference category), privately traded, sole proprietorship, partnership, limited partnership, and other categories. Female ownership is a dummy variable indicating the proportion of the SME owned by women, while foreign ownership is a continuous measure indicating the proportionate ownership by foreign owners. Ownership concentration is a continuous measure representing the proportionate ownership by the largest owner, and subsidiary status is a dummy variable indicating whether an SME is part of a larger firm. Size is represented by three dummy variables: small (used as the reference category), medium-sized, and large SMEs. Manager experience (mgr_exp) is a continuous variable indicating the number of years of experience the top manager has in the industry. The firm's perception of corruption is captured by the variable Cpt_percpn, which is measured on a five-point Likert-type scale, with 0 indicating no obstacle (used as the reference category), and 4 indicating a very severe obstacle. The study also includes three country-level control variables: institutional quality (IQ), which measures the institutional quality of a country and is derived from the six dimensions of governance, corruption perception index (CPI), which measures the perceived level of corruption in a country, and the index of financial development (FD), which measures the level of financial development within a country. CPI is a composite index is measured from 0 to 100 and covers the period between 1995 and 2021. Finally, FD is an aggregate measure of financial market depth, access, and efficiency within a country, ranging from 0.00 to 1.00. The subscripts I, j, t represent an SME, country, and time while $\acute{\varepsilon}$ is the error term.

Three models are specified to examine the variables of interest, namely external audit, ISC, and government contracts. These models are presented in equations 2.2, 2.3, and 2.4 as follows.

Equation 2.2

$$Finance\ access\ obstacles_{ij,,t} = External\_audit_{i,j,t} + Firm\_controls_{\ i,j,t} + Country\_controls_{\ i,j,t}$$ (Eq. 2.2)

Equation 2.3

$$Finance\ access\ obstacles_{\ ij,,t} = ISC_{i,j,t} + Firm\_controls_{\ i,j,t} + Country\_controls_{\ i,j,t}\ \acute{\varepsilon}_{i,j,t}$$ (Eq. 2.3)

Equation 2.4

$$Finance\ access\ obstacles_{\ ij,,t} = Government\ contract_{i,j,t} + Firm\_controls_{\ i,j,t} + Country\_controls_{\ i,j,t}\ \acute{\varepsilon}_{i,j,t}$$
(Eq. 2.4)

Where, the dependent variable in this study is finance access obstacles, and the binary variables of interest are included in three models. In Eq. 2.2, external audit indicates whether an SME has its financial statements certified by an external auditor. In Eq. 2.3, ISC indicates whether an SME has an internationally recognized standards certificate. In Eq. 2.4, government

contracts indicate whether an SME has acquired a government contract. The firm and country controls are included in each model, as in Eq. 2.1. Finally, marginal effects are estimated.

An inclusive model that includes all three variables of interest is estimated as specified in Eq. 2.5 below. The binary variables of interest in this model are external audit, ISC, and government contracts, which indicate whether an SME has its financial statements certified by an external auditor, has an internationally recognized standards certificate, or has acquired a government contract, respectively. As with Eq. 2.1 to Eq. 2.4, the firm and country controls are included in the model. The estimated marginal effects are then used to assess the impact of each variable on access to finance.

Equation 2.5

$Finance\ access\ obstacles_{\ ij,,t} = External\_audit_{i,j,t} + ISC_{i,j,t} + Government\_Contract_{i,j,t} + Firm\_controls_{\ i,j,t} + Country\_controls_{\ i,j,t}\ \acute{\varepsilon}_{i,j,t}$ (Eq. 2.5)

To test the robustness of the results, an alternative objective variable, credit constraint, is used and estimated with an ordered Probit model. The equation is shown in Eq. 2.6 below. The independent variables of interest are external audit, ISC, and government contracts, and the firm and country controls are included in the model. Marginal effects are also estimated for this model to facilitate the interpretation of the results.

Equation 2.6

$Credit\ constraint_{\ ij,,t} = External\_audit_{i,j,t} + ISC_{i,j,t} + Government\_Contract_{i,j,t} + Firm\_controls_{\ i,j,t} + Country\_controls_{\ i,j,t}\ \acute{\varepsilon}_{i,j,t}$ (Eq. 2.6)

2.4 Results

2.4.1 Descriptive statistics

One of the key questions in the World Bank Enterprise Survey (WBES) is question M1a, which asks respondents to identify the most significant obstacle affecting their establishment's operations (World Bank 2021). The question provides fifteen potential obstacles, and respondents select the most significant obstacle(s) that impact their growth. Access to finance is the most commonly selected obstacle, followed by tax rates and electricity (World Bank 2021). The dataset used in this study comprises 174,297 SMEs, with 82,052 categorized as small (below 20 permanent employees), 58,829 as medium-sized (between 20 and 99 permanent employees), and 33,416 as large (above 99 permanent employees) (World Bank

2022). Table 2.1 summarizes the descriptive statistics of the primary dependent variables in the study.

Table 2.1 Descriptive Statistics Summary

The table presents summary statistics for the key variables in the study. The dependent variables are categorical and include the primary variable of interest, finance access obstacles, as well as the alternative variable, credit constraint. The variables of interest are binary and include external audit, international standard certification (ISC), and government contracts. The firm controls consist of firm size (categorical), business legal status (categorical), ownership concentration (continuous), female ownership (binary), foreign ownership (continuous), subsidiary status (binary), manager experience (continuous), and the firm's perception of corruption as an obstacle to growth (categorical). The country controls include corruption perception index (CPI), index of financial development (FD), and institutional quality (IQ).

Variable	N	Mean	Std. Dev.	Min	Max
Dependent variables					
Finance access obstacles	168826	1.422	1.32	0	4
Credit constraint	150945	1.977	1.129	1	4
Variables of interest					
External audit	170901	.51	.5	0	1
ISC	168971	.233	.423	0	1
Govt. contract	151597	.173	.379	0	1
Firm Controls					
SME size	174297	1.721	.765	1	3
Business legal status	173001	2.769	1.091	1	6
Ownership concentration	166000	.795	.263	0	1
Female ownership	164482	.331	.47	0	1
Foreign ownership	171413	.08	.253	0	1
Subsidiary status	170744	.172	.377	0	1
Manager experience	169593	18.034	11.324	0	70
Firm corruption perception	167032	1.637	1.488	0	4
Country Controls					
Corruption Perception Index	171053	.368	.142	.131	.91
Index of Financial Development	167936	.319	.163	.047	.777
Institutional quality	172794	.412	.223	.012	.996

The main dependent variable in this study is finance access obstacles, which is measured subjectively on a five-point Likert-type scale indicating the severity of obstacles to accessing credit (WBES 2022). To provide a robustness check, an objective measure of SME credit constraint is also constructed, ranging from 1 to 4, with a mean of 1.98. On average, 51% of the SMEs use external auditors (World Bank 2019), 22.3% have ISC (Goedhuys and Sleuwaegen 2016), and 17.3% have government contracts (World Bank 2017a). The ownership of SMEs is dominated by shareholding companies with non-traded shares and sole proprietorships, with high ownership concentration (Munir et al. 2018). On average, 33.1% of SMEs are partly owned by women (WBES 2022), while foreign ownership averages 8% (Munir et al. 2018). The average experience of the top manager in the industry is 18 years (WBES 2022). Corruption perception as an obstacle to firm operations has a mean of 1.64 on

a range of 0 to 4, while the CPI, FD, and IQ country variables have means of 36.8%, 31.8%, and 41.2%, respectively (Transparency International 2021; World Bank 2019). However, the country variables exhibit moderate to very strong correlation coefficients with each other, with IQ being dropped from the main model to avoid collinearity issues.

The spearman rank correlation coefficient matrix of the key variables shows that finance access obstacles and credit constraint have a positive and statistically significant correlation coefficient of 0.35. The bivariate correlation between finance access and external audit and ISC is negative and statistically significant at the 1% level, with correlation coefficients of -0.06 and -0.09, respectively. The correlation coefficient between finance access and government contracts is positive and statistically significant at the 1% level. The bivariate correlation between finance access and female ownership, foreign ownership, subsidiary status, and manager experience is negative and statistically significant at the 1% level, while the bivariate correlation coefficients between business legal status, firm corruption perception as an obstacle to growth, and concentration of ownership are positive and statistically significant at the 1% level. The bivariate correlation coefficients between finance access and the country controls, CPI, FD, and IQ are negative and statistically significant at the 1% level, with moderate to very strong correlation coefficients between each other. Table 2.2 provides the correlation coefficients for all the key variables in the study.

Table 2.2: Spearman's Rank Correlation Coefficient Matrix

The table presents a Spearman's rank correlation matrix of the key variables in the study. The first two variables are the dependent variables: (1) finance access obstacles and (2) credit constraint. The next three variables are the binary variables of interest: (3) external audit, (4) international standard certification (ISC), and (5) government contracts. The firm level controls are: (6) business legal status - categorical, (7) female ownership - binary, (8) foreign ownership - continuous, (9) subsidiary status - binary, (10) manager experience - continuous, (11) perception of corruption as an obstacle to the firm - categorical, and (12) ownership concentration - continuous. The country controls are also continuous and include: (13) Corruption Perception Index (CPI), (14) Index of Financial Development (FD), and (15) Institutional Quality (IQ).

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Fin. access	1.000								
(2) C. const.	0.347*	1.000							
(3) Ext. audit	-0.061*	-0.077*	1.000						
(4) ISC	-0.092*	-0.058*	-0.023*	1.000					
(5) Govt. ctrct.	0.052*	0.024*	0.094*	0.063	1.000				
(6) legal status	0.076*	0.083*	-0.046*	-0.100*	-0.054*	1.000			
(7) female	-0.018*	-0.005	0.003*	0.026*	0.024*	-0.076*	1.000		
(8) foreign	-0.049*	-0.058*	0.139*	0.162*	0.020*	-0.091*	-0.010*	1.000	
(9) subsidiary	-0.040*	-0.059*	0.166*	0.153*	0.0367*	-0.047*	0.005	0.157*	1.000
(10) Mgr. exp	-0.044*	-0.066*	0.088*	0.082*	0.043*	-0.078*	0.056*	-02027*	0.020*
(11) Corrupt.	0.304*	0.104*	0.027*	-0.028*	0.049*	0.060*	-0.037*	-0.016*	0.013*
(12) ownership	0.012*	0.036*	-0.177*	-0.147**	-0.071*	0.125*	-0.207*	-0.113*	-0.089*

(13) CPI	-0.118*	-0.125*	0.133*	0.178*	-0.001	-0.115*	0.066*	0.013*	0.036*
(14) FD	-0.172*	-0.126*	0.090*	0.196*	-0.026*	-0.166*	0.036*	-0.081*	0.017*
(15) IQ	-0.126*	-0.125*	0.139*	-0.182*	-0.010*	-0.083*	0.053*	0.006	0.020*

Variables (Contd.)	*(10)*	*(11)*	*(12)*	*(13)*	*(14)*	*(15)*
(10) Mgr. exp	1.000					
(11) Corrupt.	0.022*	1.000				
(12) ownership	0.143*	-0.061*	1.000			
(13) CPI	0.184*	-0.189*	-0.103*	1.000		
(14) FD	0.153*	-0.127*	-0.137*	0.583*	1.000	
(15) IQ	0.149*	-0.202*	-0.093*	0.934*	0.582*	1.000

* $p<0.01$

2.4.2 Empirical Results

Table 2.3 presents the marginal effects obtained from the ordered Probit regression models specified in Eq. 2.1, Eq. 2.2, Eq. 2.3, and Eq. 2.4. The dependent variable, finance access, is a subjective measure that reflects the severity of obstacles to accessing finance for an SME, ranging from 0 to 4, with higher values indicating more severe obstacles. In column (1), the baseline model includes control variables such as firm size, years of experience of top managers, business legal status, ownership dynamics, and corruption perception. The subsequent columns labelled (2), (3), and (4) introduce the variables of interest individually, namely external audit, ISC, and government contracts.

Table 2.3 The effect of external audit, ISC, and government contract on SME finance

The table presents regression results from estimations specified in EQ2.1, EQ2.2, EQ2.3, and EQ2.4. The dependent variable is finance access, measured on a ranked ordinal variable using a Likert scale indicating the severity of obstacles to accessing finance. The scale ranges from 0 for no obstacle to 4 for a very severe obstacle. Column 1 shows the coefficients from the baseline model, while columns 2 through 4 present the coefficients with inclusion of the variables of interest, which are external audits, ISC, and government contracts. The firm controls include ownership variables such as female ownership, foreign ownership, subsidiary status, manager experience, and ownership concentration. The country controls include corruption perception index (CPI) and the index of financial development (FD). Additionally, size dummies (with small SMEs as the base category), business legal status dummies, firm perception of corruption as an obstacle to the firm, and year dummies are included.

Variables	Predicted coefficient sign	(1)	(2)	(3)	(4)
	Finance access	Finance access	Finance access	Finance access	Finance access
External audit	-		-0.064***		
			(-10.01)		
ISC	-			-0.065***	
				(-8.42)	
Govt. contracts	+				0.125***
					(14.92)
Firm controls					
Female ownership	-	-0.009	-0.007	-0.009	-0.014**

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		(-1.30)	(-1.10)	(-1.37)	(-2.01)
Foreign ownership	-	-0.206***	-0.199***	-0.199***	-0.210***
		(-15.41)	(-14.78)	(-14.59)	(-14.40)
Subsidiary status	-	-0.055***	-0.051***	-0.055***	-0.060***
		(-6.68)	(-6.06)	(-6.50)	(-6.73)
Manager Experience	-	-0.002***	-0.002***	-0.002***	-0.002***
		(-8.83)	(-8.64)	(-8.64)	(-6.06)
Ownership conc.	-	-0.089***	-0.096***	-0.088***	-0.060***
		(-6.40)	(-6.84)	(-6.20)	(-3.91)
Country controls					
CPI	-	0.305***	0.328***	0.310***	0.293***
		(9.70)	(10.36)	(9.69)	(8.59)
FD	-	-1.023***	-1.026***	-1.013***	-0.945***
		(-36.57)	(-36.47)	(-35.58)	(-31.78)
Size: Base - Small					
Medium	-	-0.082***	-0.071***	-0.075***	-0.087***
		(-12.09)	(-10.33)	(-10.76)	(-11.90)
Large	-	-0.159***	-0.140***	-0.136***	-0.156***
		(-18.42)	(-15.72)	(-14.77)	(-16.95)
Firm legal status		Yes	Yes	Yes	Yes
Corruption perception: firm		Yes	Yes	Yes	Yes
Year effects		Yes	Yes	Yes	Yes
Pseudo R^2		0.0424	0.0427	0.0428	0.0450
Observations		136095	134434	132,928	118,843

t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01

The results of the baseline model in Table 2.3 confirm the predicted signs of the coefficients for the impact of firm-level and country-level controls on finance access. Female ownership, foreign ownership, subsidiary status, and manager experience have negative effects, while business legal status and ownership concentration have positive effects. However, the omitted variable IQ, which is highly correlated with the other country-level variables, might affect the results. Although female ownership has a negative effect on finance access obstacles, it is not statistically significant. Foreign ownership, subsidiary status, manager experience, and ownership concentration have negative and statistically significant coefficients.

Contrary to the prediction, the effect of CPI on finance access obstacles is positive. Therefore, in the robustness section, institutional quality is used as a replacement for the CPI variable to examine this relationship further. On the other hand, the relationship between FD and SME finance is positive and statistically significant, consistent with the prediction. This suggests that SMEs in countries with more developed, accessible, and efficient financial markets and institutions have fewer obstacles in accessing finance.

The results from the main model in Table 2.3 show that engaging external auditors has a negative and statistically significant effect on finance access obstacles in all models, supporting hypothesis 2.1. Similarly, having internationally recognized standards certificates has a negative and statistically significant effect on finance access obstacles in all models, supporting hypothesis 2.2. In contrast, acquiring government contracts has a positive and statistically significant effect on finance access obstacles in all models, supporting hypothesis 2.3.

Table 2.4 confirms these results by presenting the marginal effects of the combined model in column (1), and subsequently, the marginal effects on each outcome in columns labelled (2) to (6). The results show that external audit and ISC have significant negative effects on finance access obstacles, while government contracts have a significant positive effect, consistent with the main analysis. Moreover, the firm and country-level control variables also play a role in determining SMEs' access to finance.

Overall, the study finds that engaging external auditors and having internationally recognized standards certificates can be beneficial in reducing obstacles to accessing finance for SMEs, while acquiring government contracts may increase the obstacles. These findings can provide valuable insights for policymakers and SME owners in improving SMEs' access to finance.

Table 2.4: The effect of external audit, ISC, and government contract on SME finance: predicted outcomes.

Table 2.5 presents the results of the regression analysis, estimated in EQ2.5, and the marginal effects for each of the five outcomes in subsequent columns (2) through (6). The dependent variable is access to finance, measured on a ranked ordinal variable on a Likert scale according to the severity of the obstacles to accessing finance for a firm. These range from zero, indicating no obstacle, to four, indicating a very severe obstacle. The firm and country controls used in the analysis are also included. Column (1) presents the coefficients from the regression model estimated in EQ2.5. The subsequent columns (2) through (6) present the marginal effects for each of the five outcomes, ranging from no obstacle to very severe obstacles.

		Predicted outcomes				
	(1)	(2)	(3)	(4)	(5)	(6)
	Finance access	(No obstacle)	(Minor obstacle)	(Moderate obstacle)	(Major obstacle)	(Very severe obstacle)
Ext audit	-0.061***	0.023***	0.001***	-0.007***	-0.010***	-0.007***
	(-8.72)	(8.72)	(8.17)	(-8.69)	(-8.70)	(-8.70)
ISC	-0.069***	0.026***	0.001***	-0.008***	-0.011***	-0.008***
	(-8.34)	(8.34)	(7.86)	(-8.32)	(-8.32)	(-8.33)
Govt. contracts	0.130***	-0.049***	-0.002***	0.015***	0.021***	0.015***
	(15.16)	(-15.16)	(-12.79)	(15.02)	(15.07)	(15.06)
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.0458					
Observations	114815	114815	114815	114815	114815	114815

t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01

2.4.3 Additional Analysis and Robustness

Alternative credit constraint measure.

Table 2.5 presents the results of the replay analysis using credit constraint as the dependent variable. In column (1), the baseline model is presented, and subsequent columns (2) to (4) introduce the variables of interest. The results show that external audit has a significant negative effect on credit constraint in all models, consistent with the main analysis. The negative and significant effect of ISC on credit constraint is only observed in column (4) and not in the main analysis. On the other hand, the positive and significant effect of government contracts on credit constraint is present in all models, consistent with the main analysis. Interestingly, the coefficients for female ownership and CPI in the credit constraint model differ from the main analysis. Female ownership has a positive and significant effect on credit constraint, while CPI has a negative and significant effect on credit constraint. This finding is consistent with prior research on the relationship between female ownership and credit constraint (Asiedu et al. 2013; Aterido et al. 2013; Beck et al. 2018; Morsy 2020). Moreover, the negative effect of corruption on SME finance is also supported by previous research (Amin and Motta 2021). These results suggest that the impact of these variables on SME finance may depend on the measure of finance access utilized in the analysis. In conclusion, the replay analysis using credit constraint as an alternative objective measure supports the main findings of the study, indicating that engaging external auditors and ISC can reduce credit constraints, while government contracts may increase credit constraints. Additionally, the results suggest that the impact of female ownership and corruption on SME finance may depend on the measure of finance access utilized in the analysis. These findings can inform policymakers and SME owners in developing effective policies to improve SMEs' access to finance.

Table 2.5: The effect of external audit, ISC, and government contract on SME credit constraint

The table presents the results of the regression models specified in EQ2.1, EQ2.2, EQ2.3, and EQ2.4, with credit constraint as the dependent variable. The credit constraint variable is measured on a scale of 1 to 4, where 1 indicates not credit constrained (NCC), 2 indicates may be credit constrained (MCC), 3 indicates partially credit constrained (PCC), and 4 indicates fully credit constrained (FCC). The coefficients from the baseline model are presented in column 1, while columns 2 to 4 show the coefficients with the inclusion of the variables of interest - external audits, ISC, and government contracts. The firm-level controls consist of female ownership, foreign ownership, subsidiary status, manager experience, and ownership concentration. The country-level controls consist of the corruption perception index (CPI) and the index of financial development. The model also includes size dummies (with small SMEs as the base category), business legal status dummies, firm perception of corruption as an obstacle, and year dummies.

Variables	Predicted coefficient sign	(1)	(2)	(3)	(4)
		Credit constraint	Credit constraint	Credit constraint	Credit constraint
External audit	-		-0.096***		
			(-13.60)		
ISC	-			-0.001	
				(-0.16)	
Govt. contracts	+				0.050***
					(5.81)

Firm controls					
Female ownership	-	0.013*	0.014**	0.012	0.010
		(1.91)	(2.00)	(1.62)	(1.29)
Foreign ownership	-	-0.234***	-0.219***	-0.236***	-0.239***
		(-16.00)	(-14.92)	(-15.84)	(-14.68)
Subsidiary status	-	-0.099***	-0.091***	-0.097***	-0.099***
		(-11.07)	(-10.12)	(-10.73)	(-10.40)
Manager Experience	-	-0.002***	-0.002***	-0.002***	-0.002***
		(-7.22)	(-6.85)	(-7.27)	(-5.70)
Ownership conc.	-	-0.041***	-0.050***	-0.043***	-0.037**
		(-2.79)	(-3.38)	(-2.87)	(-2.28)
Country controls					
CPI	-	-0.293***	-0.263***	-0.293***	-0.331***
		(-8.85)	(-7.90)	(-8.72)	(-9.18)
FD	-	-0.590***	-0.585***	-0.597***	-0.502***
		(-18.91)	(-18.71)	(-18.84)	(-15.34)
Size: Base - Small					
Medium	-	-0.073***	-0.059***	-0.073***	-0.063***
		(-9.71)	(-7.63)	(-9.50)	(-7.67)
Large	-	-0.094***	-0.065***	-0.094***	-0.084***
		(-10.31)	(-6.88)	(-9.70)	(-8.61)
Firm legal status		Yes	Yes	Yes	Yes
Corruption perception: firm		Yes	Yes	Yes	Yes
Year effects		Yes	Yes	Yes	Yes
Pseudo R^2		0.0235	0.0242	0.0237	0.0233
Observations		124,257	123202	121,512	107,041

t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01

Table 2.6 presents the results of the regression model specified in Eq. 2.6, which includes all three variables of interest, namely external audit, ISC, and government contracts. The alternative dependent variable, credit constraint, is used, and the model includes firm and country controls. The results indicate that SMEs that engage external auditors experience a reduction in credit constraint by 8.3% (Asiedu et al. 2013). Furthermore, SMEs that engage external auditors have a 3.3% higher probability of being not credit constrained (NCC), and their probabilities of being maybe credit constrained (MCC), partially credit constrained (PCC), and fully credit constrained (FCC) are reduced by -0.4%, -1%, and -1.8%, respectively. These results are consistent with the findings from the main analysis, and support hypothesis 2.1 (Beck et al. 2018).

In contrast, the acquisition of ISC increases SME credit constraint (Morsy 2020). The results indicate that ISC may represent a cost burden that outweighs the benefits for SMEs. Additionally, the type of ISC acquired by a firm may influence the results. However, the WBES does not distinguish between different types of ISC. Therefore, the results contrast with previous studies that suggest that ISC improves external credit access (Aterido et al. 2013).

Finally, the results show that government contracts have a positive and statistically significant effect on SME credit constraint (Morsy 2020). This finding confirms hypothesis 2.3, suggesting

that implicit and explicit cost burdens related to 'ring-fencing' of government procurement contracts may adversely affect SMEs' access to finance.

Table 2.6: The effect of external audit, ISC, and government contract on credit constraint: predicted outcomes.

The table presents the coefficients from the regression estimated in EQ 2.6 in column (1). Subsequent columns (2), (3), (4), and (5) present the marginal effects for each of the four outcomes. The dependent variable is credit constraint, with four categories. These are 1-not credit constrained (NCC), 2-may be credit constrained (MCC), 3-Partially credit constrained (PCC), and 4- Fully credit constrained. Firm and country controls are included.

		Marginal effects			
	(1)	(2)	(3)	(4)	(5)
	Finance access	(NCC)	(MCC)	(PCC)	(FCC)
Ext audit	-0.083***	0.033***	-0.004***	-0.010***	-0.018***
	(-10.59)	(10.59)	(-10.54)	(-10.55)	(-10.56)
ISC	0.016*	-0.006*	0.001*	0.002*	0.004*
	(1.84)	(-1.84)	(1.84)	(1.84)	(1.84)
Govt. contracts	0.056***	-0.022***	0.003***	0.007***	0.012***
	(6.30)	(-6.30)	(6.23)	(6.29)	(6.30)
Firm controls	Yes	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.0238				
Observations	103,878	103,878	103,878	103,878	103,878

t statistics in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Impact of Firm Size on the Relationship between External Audit, ISC, Government Contracts and Access to Finance.

The size of an SME is an essential determinant of its access to finance. Therefore, sub-sample analyses based on the size of SMEs were conducted to investigate whether the relationship between external audit, ISC, and government contracts on finance access differs across SMEs of different sizes. The sub-samples were defined as small (less than 20 employees), medium (between 20 and 99 employees), and large (above 99 employees). Figure 2.2 shows that the severity of finance access obstacles increases with SME size. Small SMEs have the most severe finance access obstacles, followed by medium SMEs, while large SMEs have the least severe finance access obstacles. The average scores for finance access obstacles for small, medium, and large SMEs are 2.08, 1.92, and 1.81, respectively, suggesting that small SMEs face the most significant finance access obstacles, which may limit their growth and development opportunities.
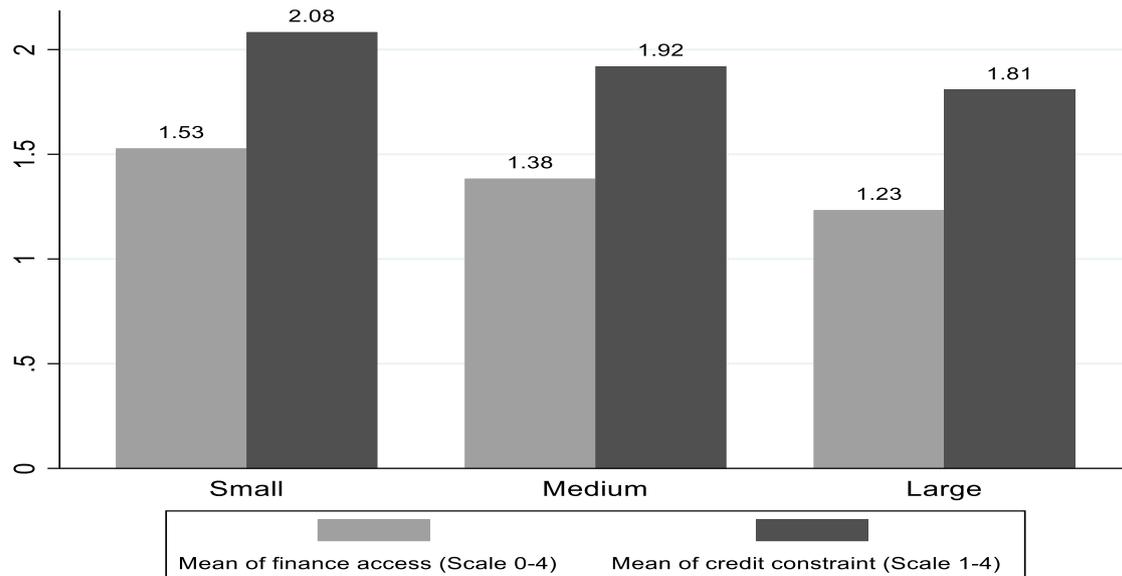
Figure 2.1: Finance access and credit constraint by SME size

Figure 2.3 compares the variables of interest, external audit, ISC, and government contracts, by SME size. The figure illustrates that larger SMEs tend to have a higher demand for external audit services, a higher probability of acquiring an ISC, and a greater procurement of government contracts than smaller SMEs. To investigate whether there are any statistical differences in SME access to finance obstacles based on SME size, I re-estimated Eq. 2.5 and Eq. 2.6.

Figure 2.2: Comparison of means of external audit, ISC, and government contracts by SME size.
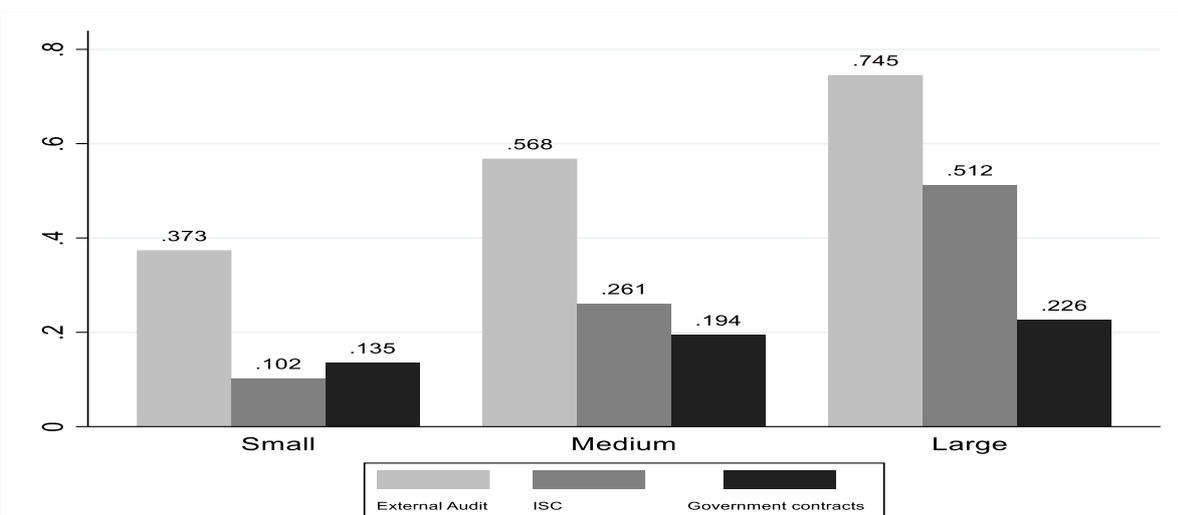
The results in Table 2.7 suggest that the impact of external audit, ISC, and government contracts on access to finance varies across SME sizes. The negative and significant impact of

external audit on finance access obstacles is consistent across all SME sizes, indicating that external audit can reduce obstacles to accessing finance for SMEs of all sizes. However, the impact of external audit on credit constraint is only weakly significant for large firms, suggesting that the influence of external audit on credit constraint is less important for large SMEs.

The negative and significant impact of ISC on finance access obstacles is consistent across all SME sizes, indicating that the acquisition of ISC may impose a cost burden that outweighs the benefits for SMEs of all sizes. However, the impact of ISC on credit constraint is only significant for small SMEs, suggesting that the influence of ISC on credit constraint is more important for small SMEs.

The positive and significant impact of government contracts on finance access obstacles is consistent across all SME sizes, indicating that SMEs with government contracts are more likely to report severe obstacles to accessing finance. The positive impact of government contracts on credit constraint is significant for small and medium-sized SMEs, but not for large SMEs, suggesting that the ring-fencing of government procurement contracts may adversely affect the financing needs of small and medium-sized SMEs more than larger ones.

Overall, the results suggest that the challenges faced by SMEs in accessing finance are influenced by firm size.

Table 2.7: The effect of external audit, ISC, and government contract on SME finance: Size effect:

Table 2.7 reports the regression results from the estimations specified in EQ2.5, where the sample is disaggregated by firm size, small, medium, and large. The dependent variables are finance access obstacles and credit constraint, and the results are presented in columns 1-3 and 4-6, respectively. The variables of interest are external audit, ISC, and government contracts, and the model includes firm and country controls.

	Small	Medium	Large	Small	Medium	large
Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Finance access	Finance access	Finance access	Credit constraint	Credit constraint	Credit constraint
External audit	-0.073***	-0.039***	-0.032*	-0.071***	-0.082***	-0.083***
	(-7.10)	(-3.33)	(-1.80)	(-6.25)	(-6.37)	(-4.03)
ISC	-0.076***	-0.084***	-0.069***	-0.047***	0.017	0.029*
	(-4.77)	(-6.54)	(-4.42)	(-2.72)	(1.25)	(1.72)
Govt. contracts	0.133***	0.138***	0.115***	0.031**	0.108***	0.028
	(9.72)	(9.78)	(6.33)	(2.08)	(7.47)	(1.52)
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.0479	0.0448	0.0440	0.0290	0.0205	0.0229
Observations	53,073	39,644	22,098	48,548	35,729	19,601

Impact of institutional differences on the Relationship between External Audit, ISC, Government Contracts and Access to Finance.

Statistically significant differences exist for the three institutional settings across the regions in the sample, as confirmed by a pairwise comparison of means t-test estimated using the Duncan's estimation technique (Jann 2005). Therefore, motivated by these differences, the study generated two sub-samples based on the medians of CPI (0.33), FD (0.32), and IQ (0.4), resulting in six groups. The study then re-estimated the regression model based on these sub-samples to examine if the effects of the variables of interest vary across the different institutional settings. Table 2.8 presents the results, which indicate that the effects from the main model are robust across the six sub-samples. Specifically, external audit and ISC have negative and statistically significant coefficients, while government contract has a positive coefficient significant at the 1% level. This suggests that the impact of external audit, ISC, and government contracts on SMEs' access to finance is consistent across different institutional settings. However, it is important to note that institutional factors, such as corruption perception and financial development, play a crucial role in SMEs' access to finance, and policymakers should consider these factors in designing policies to improve SMEs' access to finance.

Table 2.8: The effect of external audit, ISC, and government contract SME finance: Institutional setting

Table 2.8 presents the regression results from EQ2.5, with the dependent variable being access to finance measured on a ranked ordinal scale ranging from 0 (no obstacle) to 4 (very severe obstacle). Column 1 shows the coefficients from the baseline model, while columns 2 through 4 display the coefficients with the inclusion of the variables of interest: external audits, ISC, and government contracts. The firm controls comprise of female ownership, foreign ownership, subsidiary status, manager experience, and ownership concentration.

To account for institutional differences, I generated six sub-samples based on the median values of CPI (0.33), FD (0.32), and IQ (0.40), and estimated the regression model for each group. The results suggest robustness across the sub-samples, with external audits and ISC having negative and statistically significant coefficients, while government contracts have a positive and significant coefficient at the 1% level. I used a pairwise comparison of means t-test using the Duncan's estimation technique (Jann 2005) to confirm the statistically significant differences in the institutional settings across the regions in the sample.

	CPI		FD		IQ	
	Low CPI	High CPI	Low FD	High FD	Low IQ	High IQ
Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Finance access	Finance access	Finance access	Finance access	Finance access	Finance access
External audit	-0.065***	-0.040***	-0.023**	-0.033***	-0.047***	-0.055***
	(-6.08)	(-4.22)	(-2.29)	(-3.34)	(-4.23)	(-5.90)
ISC	-0.046***	-0.076***	-0.080***	-0.072***	-0.041***	-0.071***
	(-3.24)	(-7.34)	(-6.02)	(-6.80)	(-2.82)	(-6.94)
Govt. contracts	0.139***	0.121***	0.132***	0.161***	0.131***	0.130***
	(10.64)	(10.60)	(10.74)	(13.72)	(9.94)	(11.51)
Firm controls						
Female ownership	-0.030***	0.000	-0.002	-0.027***	-0.029***	-0.001
	(-2.75)	(0.02)	(-0.22)	(-2.74)	(-2.62)	(-0.12)
Foreign ownership	-0.183***	-0.213***	-0.144***	-0.224***	-0.160***	-0.220***

	(1)	(2)	(3)	(4)	(5)	(6)
	(-8.15)	(-10.57)	(-7.55)	(-9.32)	(-7.19)	(-10.84)
Subsidiary status	-0.080***	-0.038***	-0.119***	0.005	-0.085***	-0.018
	(-5.76)	(-3.17)	(-8.99)	(0.42)	(-6.23)	(-1.47)
Manager Experience	-0.000	-0.003***	-0.003***	-0.002***	-0.000	-0.003***
	(-0.28)	(-6.69)	(-5.58)	(-5.31)	(-0.92)	(-6.23)
Ownership conc.	-0.161***	-0.021	-0.131***	-0.034	-0.173***	0.004
	(-6.49)	(-1.04)	(-5.57)	(-1.62)	(-7.07)	(0.17)
Country controls						
CPI			0.721***	-0.308***		
			(13.74)	(-8.20)		
FD	-0.251***	-1.033***			-0.039	-0.988***
	(-4.41)	(-30.18)			(-0.65)	(-30.52)
IQ						
Size: Base - Small						
Medium	-0.078***	-0.051***	-0.100***	-0.031***	-0.068***	-0.065***
	(-6.88)	(-4.99)	(-9.15)	(-3.03)	(-5.80)	(-6.58)
Large	-0.114***	-0.105***	-0.164***	-0.091***	-0.112***	-0.119***
	(-7.58)	(-7.82)	(-11.04)	(-6.84)	(-7.26)	(-9.07)
Firm legal status	Yes	Yes	Yes	Yes	Yes	Yes
Corruption perception: firm	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.0415	0.0531	0.0375	0.0602	0.0383	0.0526
Observations	51,043	64,494	53,003	64,761	47,671	67,866

t statistics in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Impact of regional differences on the Relationship between External Audit, ISC, Government Contracts and Access to Finance.

Figure 2.4 illustrates significant regional variations in the levels of credit constraint and finance access obstacles for the six regions examined, namely Sub-Saharan Africa (AFR), East Asia and the Pacific (EAP), Europe and Central Asia (ECA), Latin America and the Caribbean (LAC), Middle East and North Africa (MNA), and South Asia (SAR). SMEs in AFR experience the highest credit constraint levels, according to both the subjective measure of finance access obstacles and the objective measure of credit constraint. Using the subjective measure, SMEs in LAC report the second highest level of credit constraint, while using the objective measure, SMEs in SAR report the second highest level. These findings underscore the significance of considering the institutional and regional context when evaluating SMEs' access to finance.
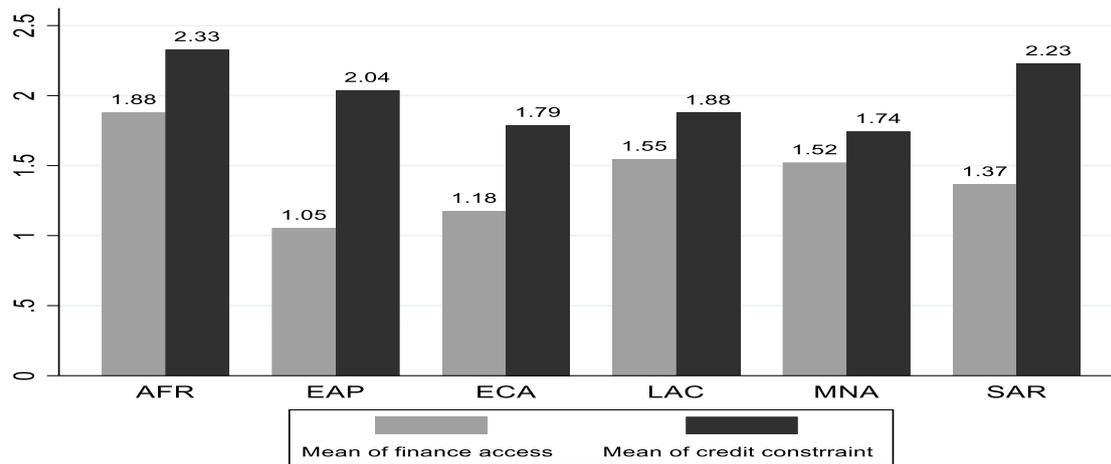
Figure 2.3: Finance access and credit constraint by region

Figure 2.5 displays the mean values of the variables of interest, namely external audit, ISC, and government contracts, by region. The figure shows that SMEs in the Middle East and North Africa (MNA), South Asia (SAR), and Latin America and the Caribbean (LAC) regions tend to have higher mean values of external audit. In terms of ISC, SMEs in the South Asia (SAR), Europe and Central Asia (ECA), and East Asia and the Pacific (EAP) regions have the highest means. Finally, SMEs in the Sub-Saharan Africa (AFR), Latin America and the Caribbean (LAC), and Europe and Central Asia (ECA) regions tend to have higher mean values of government contracts.
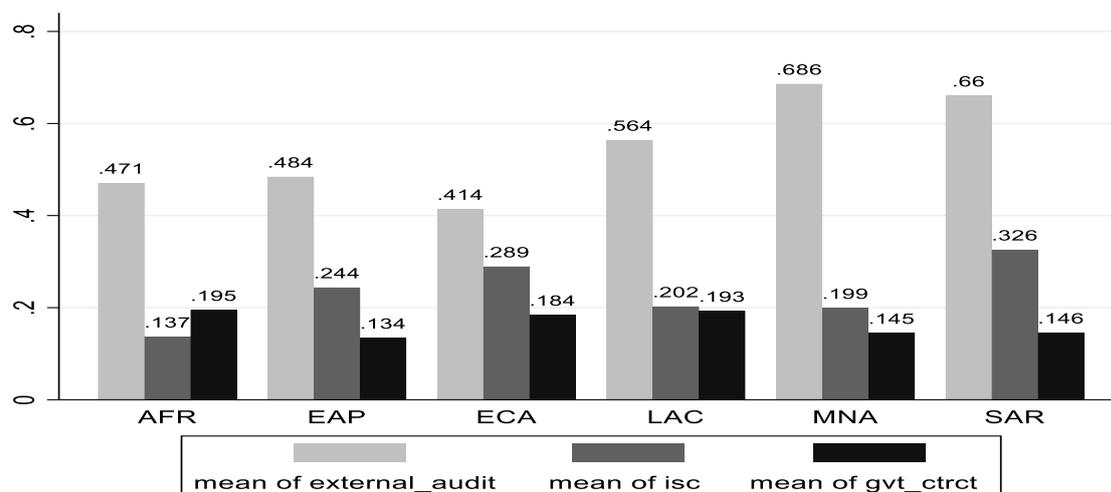
Figure 2.4: Comparison of means of external audit, ISC, and government contracts by region.

The six regions exhibit significant differences in the levels of corruption, financial development, and institutional quality. Figure 2.6 provides a bar chart that demonstrates the

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variations in CPI, FDI, and IQ among the six regions. The chart reveals that Sub-Saharan Africa (AFR) has lower levels of CPI, FD, and IQ compared to other regions, while East Asia and the Pacific (EAP) has the highest levels of these variables. These results underscore the importance of considering the regional context and institutional differences when examining SME access to finance.
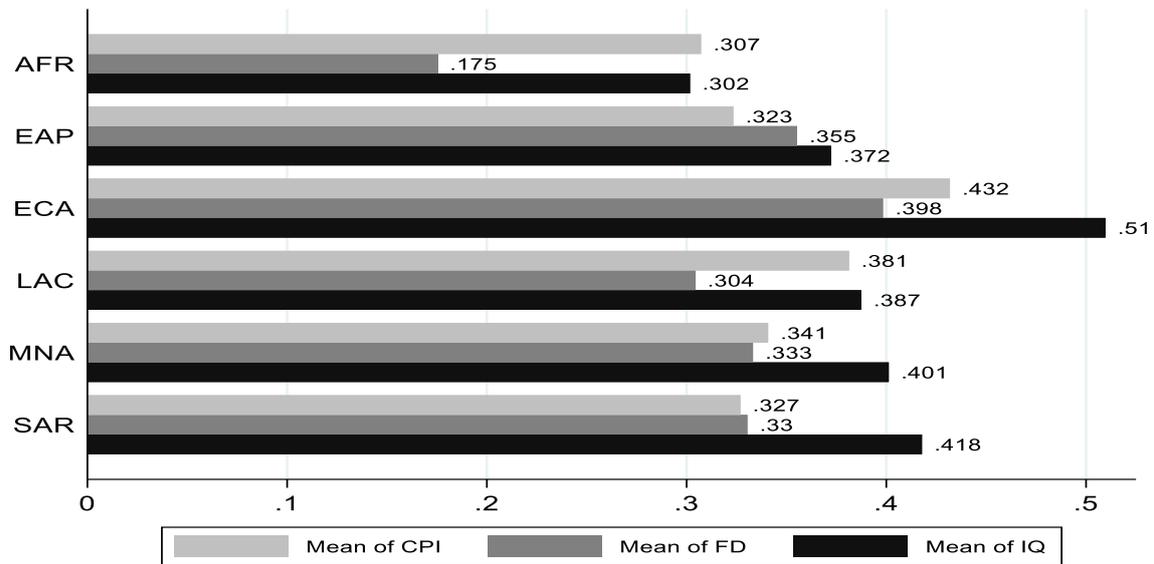
Figure 2.5: Comparison of means of CPI, FD, and IQ by region.

In light of the differences in institutional settings and credit constraint levels across the six regions, I conducted separate analyses to examine the effects of external audit, ISC, and government contracts on SME finance in each region. The results are presented in Table 2.9. The results suggest that external audit has a consistent negative effect on finance access and credit constraint in most regions, with the exception of LAC and SAR, where the relationship is positive but weakly significant. This could be due to differences in the regulatory environment, accounting standards, and the availability of audit services in these regions. Furthermore, the positive effect of external audit on finance access and credit constraint in the AFR and EAP regions might be explained by the fact that these regions have higher levels of corruption and weaker legal systems, making external audits more valuable for signaling a firm's creditworthiness and reducing information asymmetry between lenders and borrowers.

The results also show that ISC has a negative and statistically significant effect on finance access and credit constraint in all regions except for LAC, where the relationship is not significant. This finding could be attributed to the additional costs and regulatory burden

associated with obtaining and maintaining ISC, which may be more pronounced in certain regions. Lastly, the analysis suggests that government contracts have a positive and significant effect on finance access and credit constraint in all regions. This could be due to the implicit or explicit guarantees associated with government contracts, which may make SMEs more attractive to lenders and lower their perceived risk.

In summary, the separate analyses by region provide valuable insights into the effects of external audit, ISC, and government contracts on SME finance, and highlight the importance of considering the regional context when designing policies to improve SME access to finance.

Table 2.9: The effect of external audit, ISC, and government contract on SME finance: Regional effect.

Table 2.9 presents the regression results from estimations specified in EQ2.5 by region. The dependent variable is access to finance, which is measured on a Likert scale according to the severity of the obstacles to accessing finance for a firm. The variables of interest are external audit, ISC, and government contracts. The firm controls include female ownership, foreign ownership, subsidiary status, manager experience, and ownership concentration. The country controls include corruption perception index (CPI) and the index of financial development (FD). In addition, business legal status dummies, firm perception of corruption as an obstacle to the firm, and year dummies are included.

	(AFR)	(EAP)	(ECA)	(LAC)	(MNA)	(SAR)
	Finance access	Finance access	Finance access	Finance access	Finance access	Finance access
External audit	-0.111***	-0.158***	-0.049***	0.044**	-0.116***	0.043*
	(-6.10)	(-7.06)	(-3.97)	(2.47)	(-4.52)	(1.72)
ISC	-0.122***	-0.051*	-0.002	-0.064***	-0.029	-0.130***
	(-4.59)	(-1.90)	(-0.13)	(-2.96)	(-0.98)	(-5.70)
Govt. contracts	0.095***	0.128***	0.116***	0.091***	-0.045	0.296***
	(4.40)	(4.55)	(8.37)	(4.51)	(-1.31)	(10.71)
Firm controls						
Female ownership	0.066***	-0.011	-0.039***	0.001	0.017	-0.040
	(3.45)	(-0.52)	(-3.42)	(0.07)	(0.57)	(-1.34)
Foreign ownership	-0.192***	-0.346***	-0.238***	-0.150***	-0.227***	-0.248*
	(-6.27)	(-7.86)	(-9.29)	(-4.37)	(-3.64)	(-1.78)
Subsidiary status	-0.118***	-0.042	-0.086***	-0.109***	-0.125***	0.070***
	(-5.36)	(-1.27)	(-4.93)	(-5.20)	(-4.33)	(2.66)
Manager Experience	0.001	-0.001	-0.002***	-0.005***	-0.001	-0.006***
	(1.55)	(-1.29)	(-3.50)	(-6.92)	(-1.49)	(-5.94)
Ownership conc.	-0.026	0.171***	-0.077***	-0.058*	-0.200***	0.314***
	(-0.46)	(2.74)	(-3.43)	(-1.65)	(-3.03)	(4.42)
Country controls						
CPI	2.112***	3.146***	-0.587***	0.375***	0.691***	1.276***
	(16.26)	(7.67)	(-10.08)	(4.94)	(3.05)	(5.01)
FD	-2.669***	-1.380***	-0.127**	0.489***	-0.948***	-7.323***
	(-25.41)	(-8.53)	(-2.54)	(4.72)	(-4.31)	(-12.75)
Size effect	Yes	Yes	Yes	Yes	Yes	Yes
Firm legal status	Yes	Yes	Yes	Yes	Yes	Yes
Corruption perception: firm	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.0619	0.0505	0.0521	0.0341	0.0448	0.0384
Observations	17,281	12,884	44,260	17,622	10,445	12,323

t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01

Table 2.10 presents the coefficients with credit constraint as the dependent variable, focusing on the influence of external audit, ISC, and government contracts on SME finance across the

six regions. The results suggest that the effects of these variables on SME finance vary across regions.

The external audit-finance access relationship is negative and statistically significant for AFR, EAP, ECA, and MNA regions, indicating that external audit reduces obstacles to finance for SMEs in these regions. However, in the LAC and SAR regions, the relationship is positive, suggesting that external audit may not be as effective in reducing obstacles to finance for SMEs in these regions. The external audit-credit constraint relationship is negative and significant for the AFR, EAP, and ECA regions, indicating that external audit helps to alleviate credit constraint for SMEs in these regions. However, the effect on MNA is positive but weak, while in LAC and SAR, the effect is not statistically significant.

The ISC-finance access relationship has a negative and statistically significant effect for SMEs in AFR, LAC, and SAR, indicating that ISC reduces obstacles to finance in these regions. The effect is negative and weak in EAP, while in ECA and MNA, there is no statistically significant effect. The ISC-credit constraint relationship is negative and significant for AFR, suggesting that ISC can help alleviate credit constraint for SMEs in this region. However, in ECA, the effect is positive and statistically significant, while for the other regions, there is no statistically significant effect.

The government contract-finance access relationship is positive and statistically significant in all regions apart from MNA, indicating that government contracts can improve SMEs' access to finance. However, the government contract-credit constraint relationship is negative, albeit with a weak relationship in AFR, suggesting that government contracts can help alleviate credit constraint for SMEs in this region. The effect is positive and statistically significant for SMEs in the ECA, LAC, and SAR regions, highlighting the potential benefits of government contracts for SMEs in these regions. However, the relationship is insignificant in MNA. It is important to note that preferential procurement schemes by governments may be ineffective unless countries address challenges discussed in the extant literature on public procurement, such as the high cost and complex bidding process.

Overall, these findings suggest that policies designed to improve SME access to finance should consider regional and institutional differences, as the impact of external audit, ISC, and government contracts on SME finance varies across regions.

Table 2.10: The effect of external audit, ISC, and government contract on credit constraint: Regional effect

The table presents the results of regressions specified in EQ2.5 by region, with credit constraint as the dependent variable. The

credit constraint variable has four categories: 1-not credit constrained (NCC), 2-may be credit constrained (MCC), 3-partially credit constrained (PCC), and 4-fully credit constrained. The variables of interest are external audit, ISC, and government contracts, and both firm and country controls are included.

	(AFR)	(EAP)	(ECA)	(LAC)	(MNA)	(SAR)
External audit	-0.238***	-0.261***	-0.026**	-0.024	0.056*	0.022
	(-11.39)	(-10.79)	(-1.97)	(-1.18)	(1.79)	(0.81)
ISC	-0.142***	0.033	0.056***	-0.020	0.010	-0.003
	(-4.91)	(1.14)	(4.03)	(-0.92)	(0.31)	(-0.13)
Govt. contracts	-0.044*	0.027	0.063***	0.049**	-0.054	0.151***
	(-1.89)	(0.94)	(4.32)	(2.41)	(-1.48)	(5.08)
Firm controls	Yes	Yes	Yes	Yes	Yes	Yes
Country controls	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.0524	0.0199	0.0333	0.0091	0.0251	0.0114
Observations	15,360	11,651	39,873	15,818	9,818	11,358

t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01

2.5 Discussion and conclusion

This study investigates the effects of engaging external auditors, acquiring internationally recognized standards certificates, and participating in government contracts on SMEs' access to finance across different global regions. It also examines the influence of institutional and firm-level factors on SMEs' financing accessibility. The results reveal that utilizing external auditors and obtaining internationally recognized standards certificates reduce obstacles to finance access for SMEs in all regions. Conversely, engaging in government contracts generally increases these obstacles but reduces credit constraints for SMEs in some regions.

The empirical findings support all three hypotheses. Hypothesis 2.1, which posits that external audit reduces finance access obstacles for SMEs, and Hypothesis 2.2, which proposes that acquiring internationally recognized standards certificates reduces such obstacles, are both consistently supported. Lastly, Hypothesis 2.3, which suggests that government contracts increase finance access obstacles for SMEs, is also supported.

The results underscore the significance of accounting for institutional and regional contexts when analyzing SMEs' access to finance. Obstacles to finance access and credit constraints vary across regions, as do levels of corruption, financial development, and institutional quality, all of which affect SME financing accessibility. This research contributes to the literature on SME finance access by presenting empirical evidence on the impact of engaging external auditors, acquiring internationally recognized standards certificates, and participating in government contracts on SME financing accessibility. The findings imply that engaging external auditors and obtaining internationally recognized standards certificates can benefit

SMEs in terms of financing access, while government contracts might create additional obstacles in some regions.

These results emphasize the need for policymakers and SME owners to consider institutional and regional contexts when devising policies and strategies aimed at enhancing SMEs' access to finance. The significant variations in credit constraints and obstacles to finance access, as well as the influence of corruption, financial development, and institutional quality, should be considered. Future research could delve deeper into the mechanisms through which external audit, ISC, and government contracts affect SME finance access, and explore additional factors influencing SME finance access, such as financial literacy, information technology, and social networks. Ultimately, this study offers valuable insights for policymakers and SME owners in their quest to improve SMEs' access to finance.

Chapter 3

The Impact of International Financial Reporting Standards for SMEs, External Audit, and Institutional Quality on SME Finance: An Empirical Analysis

"Adopting a common set of financial reporting standards is essential for a level playing field and for global economic stability, and it also helps to improve access to finance, especially for SMEs. However, there are still challenges that need to be addressed, such as the high implementation costs and the need for capacity building and technical assistance, particularly in developing countries."

(World Bank Group, 2020).

3.0 Introduction

The adoption of International Financial Reporting Standards for Small and Medium-sized Enterprises (IFRS for SMEs) has been promoted as a means of improving financial reporting and access to finance for SMEs. However, there is limited empirical evidence on the impact of IFRS for SME adoption, legal mandate, and experience, as well as the interaction effects of external audit and institutional quality on SME finance. This chapter presents an empirical analysis of the impact of IFRS for SME-on-SME financing through bank and trade credit, and the role of external audit and institutional quality in facilitating access to finance.

This study contributes to the literature by providing insights into the effects of IFRS for SME adoption, mandate, and experience on SME financing, as well as examining the role of external audits and institutional quality in this context. It also highlights the region-specific and income-group-specific impact of IFRS for SME-on-SME finance, emphasizing the need for a tailored approach to the adoption and implementation of IFRS for SME.

The analysis is based on a wide cross-sectional dataset that includes 147,983 observations of firm-level data from 153 countries from the World Bank Enterprise Survey (WBES) data, covering the period from 2009 to 2018. The sample is divided into six regions and four country income groups based on the World Development Indicators classification. Tobit regressions are used to estimate the impact of IFRS for SME adoption, mandate, and experience on the financing of working and fixed capital.

The results of the analysis suggest that the adoption of IFRS for SME may benefit SMEs provided they have external audits in all country income groups, except for upper-middle-income countries. Moreover, the legal mandate of IFRS for SME, in combination with external audits and higher institutional quality, can facilitate access to bank and trade credit for SMEs in low-income, lower-middle-income, and upper-middle-income countries.

The findings of this study will add to the current literature on IFRS and SME finance and have important implications for policymakers and practitioners. By understanding the factors that impact SME finance, the study aims to inform policies and practices that improve SME access to finance and, in turn, contribute to SME growth and economic development.

The rest of this chapter is organized as follows. Section 3.1 presents the literature review with a background on IFRS for SME and a synthesis of the IFRS literature and the effects of external

audit, and institutional quality on financing. The hypotheses generated are also presented in the section. Section 3.2 presents the data sources and definitions of the variables used in the study. Next, section 3.3 specifies the research methodology applied in the study. Section 3.4 presents descriptive, empirical findings, robustness tests, and additional tests that are conducted in the study. Finally, section 3.5 provides the conclusions from the study.

3.1 Literature Review

3.1.1 Background: IFRS for SMEs

The background to IFRS is critical to understand, as it sets the context for the adoption and implementation of IFRS standards. International Financial Reporting Standards (IFRS) are a set of accounting principles developed by the International Accounting Standards Board (IASB) for companies to follow when preparing their financial statements (Deegan and Unerman 2011). However, it is important to note that there are different scopes of IFRS that can be applied by countries to their respective entities. The different scopes of IFRS that countries could apply include full IFRS, IFRS for Small and Medium-sized Entities (SMEs), and individual country modifications to IFRS adoption (Daske and Gebhardt, 2006). Full IFRS is designed for public interest entities with no size limitations, while IFRS for SMEs is a simplified version of full IFRS specifically tailored to the accounting needs of small and medium-sized entities. Additionally, countries can choose to adopt IFRS with modifications or adopt a modified version of IFRS specifically designed for the country's requirements. For example, the EU has mandated the adoption of IFRS for public interest entities' consolidated financial statements, but it allows member states to decide whether to extend the scope to individual company accounts or non-public interest companies (Bloomfield et al., 2016). The IFRS for SMEs is a separate standard from full IFRS, specifically designed for SMEs. The IASB issued IFRS for SMEs in 2009, influenced by the SMEGA guidelines, published in 2000 by the United Nations' working group on international standards of accounting and reporting (ISAR) (IFRS Foundation 2015). While the full IFRS is used by publicly traded companies, the IFRS for SMEs is designed for small firms that are not publicly accountable. Currently, SMEs in 86 countries either require or permit reporting under the IFRS for SMEs (Olawale and Garwe 2010). However, the slow adoption rate of IFRS for SMEs indicates the challenges SMEs face in adhering to these standards.

It is crucial to distinguish between IFRS adoption and convergence, IFRS for SMEs, and full IFRS, as they have distinct features and serve different purposes. While IFRS adoption refers to the process by which a country decides to adopt IFRS as its accounting standard, IFRS convergence refers to the process by which a country seeks to align its existing accounting standards with IFRS. IFRS for SMEs, on the other hand, is a separate standard from full IFRS designed specifically for small and medium-sized enterprises (SMEs) to provide a simplified set of accounting standards that are more appropriate for the needs of SMEs (Perera and Chand 2015).

3.1.2 IFRS for SMEs: Benefits, Challenges, and Debates

The impact of IFRS, particularly the full IFRS, has been widely studied across various interdisciplinary fields, such as accounting quality, audit verification, earnings quality, and economic growth (Balsmeier and Vanhaverbeke 2018; Bertrand et al. 2021; De George et al. 2016; Soderstrom and Sun 2007). However, debates have emerged regarding the efficacy and decision relevance of IFRS to different financial statement users (De George et al. 2016). Some experts argue that the adoption of IFRS for SMEs may be overly simplistic and provide little value to financial users, and the adoption of these standards by firms incurs a significant cost as SMEs need to hire professional accountants to prepare financial reports in compliance with the standards (Perera and Chand 2015). It is worth noting that the adoption of IFRS for SMEs may not necessarily result in improved reporting quality as other factors, such as manager incentives, could still influence the quality of financial reports. Additionally, the IFRS for SMEs omits segment reporting, a requirement under the full IFRS for listed firms (IFRS Foundation 2021).

Despite the debates, the standardization of accounting practices through IFRS can bring about several benefits, such as a reduction in information asymmetry. The adoption of IFRS for SMEs has been found to improve transparency and the reporting environment, particularly in emerging economies (Albu et al. 2013). Additionally, IFRS convergence can have a positive effect on international trade and investment by encouraging cross-listing and enhancing cross-border trade for countries with strong exports (Seay 2014; Xie et al. 2021). Furthermore, IFRS convergence can improve public and private firms' access to credit, which is crucial for SME growth and development. Several studies have shown that IFRS adoption reduces the cost of capital and increases access to credit for both private and public firms (De Moura et al. 2020; Kim et al. 2011; Bertrand et al. 2021; Tawiah and Gyapong 2021). Standardization of

accounting practices through IFRS can also have a positive impact on informal finance, particularly trade credit, by reducing default risk for suppliers (Li et al. 2021).

However, conflicting evidence suggests that lower accounting quality has a negative relationship with trade credit, as firms with lower accounting quality may use alternative methods to bridge the information asymmetry environment (Berger and Udell 2002). The effect of IFRS for SMEs on credit acquisition in different countries, such as Africa, Latin America, and the Caribbean, remains unclear and requires further investigation (Gassen 2017). Overall, while debates exist regarding the efficacy and decision relevance of IFRS, the standardization of accounting practices through IFRS can bring about several benefits, particularly for SMEs' access to credit, which is crucial for their growth and development.

Given the potential positive impact of IFRS for SMEs on credit acquisition for private and public companies, the following hypotheses have been proposed:

H3.1a: Adoption of IFRS for SMEs by a country increases bank-financed working capital for SMEs.

H3.1b: Adoption of IFRS for SMEs by a country increases trade credit-financed working capital for SMEs.

H3.1c: Adoption of IFRS for SMEs by a country increases bank-financed fixed capital for SMEs.

3.1.3 Mitigating Information Asymmetry in SME Financing: The Role of IFRS and External Audit.

While the adoption of standardized reporting frameworks such as IFRS can improve transparency, proper enforcement is crucial for its effectiveness in reducing information asymmetry (De George et al. 2016). One way to mitigate the effects of information asymmetry is through external audits, which have been shown to reduce information asymmetry between SMEs and lenders, thus improving credit access (Clatworthy and Peel 2013; Dedman and Kausar 2012; Palazuelos et al. 2018). However, as discussed in Chapter 2, most countries do not mandate external audits of private companies, and there is a shortage of professional accountants and auditors in the SME sector (Zhan et al. 2016a). The lack of transparency from SMEs, particularly family-owned ones, limits their access to formal finance from lenders due to high informational asymmetry (Hasan et al. 2021; Nitani and Legendre 2021).

Despite these challenges, external audit can play an important role in moderating the effects of IFRS adoption. Audited financial statements increase the willingness of bankers to lend credit to SMEs, thus improving their credibility and reducing informational asymmetry (Palazuelos et al. 2018; Howorth and Moro 2012). Briozzo and Albanese (2020) found that external audit increases SME financing through bank and trade credit. Moreover, Fosfuri et al. (2018) found that the benefits of external audits extend beyond financial reporting and can contribute to the development of human and social capital of SMEs, enhancing their access to financing. Therefore, the second set of hypotheses is stated as follows:

H3.2a: The positive relationship between IFRS for SME and bank-financed working capital is stronger for externally audited SMEs.

H3.2b: The positive relationship between IFRS for SME and trade credit-financed working capital is stronger for externally audited SMEs.

H3.2c: The positive relationship between IFRS for SME and bank-financed fixed capital is stronger for externally audited SMEs.

Therefore, external audits can complement the adoption of IFRS for SMEs to mitigate the effects of information asymmetry and increase access to credit. In addition to reducing informational asymmetry, external audits can also contribute to the development of human and social capital of SMEs, enhancing their access to financing.

3.1.4 Relevance of Institutional Quality in the Relationship Between IFRS Adoption and Financing for SMEs

In recent years, the adoption of IFRS has been used to improve financial reporting quality and increase access to credit for SMEs. However, the effectiveness of IFRS adoption in achieving these goals is contingent upon institutional factors, such as the legal and political system, regulatory efficiency, and corruption levels (Deegan and Samkin 2017). In this section, we explore the relevance of institutional quality in the relationship between IFRS adoption and financing for SMEs.

Studies suggest that legal and political systems play a critical role in accounting quality, as they impact the level of minority shareholder protection, debtor protection, and creditor protection in a country (La Porta et al. 2002). For instance, common law countries such as the UK and USA offer better creditor protection and stronger insolvency laws, which improve access to bank credit for firms. Consequently, these countries are more likely to adopt IFRS for SMEs.

In contrast, civil law countries such as France and Germany offer better minority shareholder protection and debtor protection. The political system also influences accounting quality, with oligarchic and totalitarian governments exerting extensive control over their private sectors and industries (Liu et al. 2021).

Moreover, institutional quality affects IFRS adoption and financing. Countries with lower institutional quality are more likely to adopt IFRS due to a lack of resources to develop their own accounting standards (Ho and Taylor 2010). However, developed countries may adapt international standards with significant changes to align with their national interests (Zeff 2007). Low governance quality and high corruption levels undermine the effectiveness of IFRS adoption, as powerful agents of corruption may lobby for voluntary implementation to avoid losing government contracts (Liu et al. 2021). This has a negative impact on the effectiveness of the standards and may deter foreign direct investment.

Considering institutional settings is crucial to understand the impact of IFRS adoption on financial reporting quality. Institutional heterogeneities may bias results, and mandatory IFRS adoption is not the only trigger for increased liquidity. Countries that adopt IFRS voluntarily may have higher capital market liquidity due to their institutional and legal strength (Boubakri et al. 2012). Some studies suggest that the effectiveness of IFRS adoption in reducing information asymmetry and improving access to credit depends on the institutional quality of the country (Daske et al. 2008).

Based on these insights, we propose the following hypotheses:

H3.3a: The positive relationship between IFRS for SME adoption and bank-financed working capital is stronger in countries with high institutional quality.

H3.3b: The positive relationship between IFRS for SME adoption and trade credit-financed working capital is stronger in countries with high institutional quality.

H3.3c: The positive relationship between IFRS for SME adoption and bank-financed fixed capital is stronger in countries with high institutional quality.

In conclusion, institutional quality plays a critical role in the effectiveness of IFRS adoption and its impact on SME financing. Policymakers should consider the institutional factors of their country when implementing IFRS standards to maximize their effectiveness.

3.2 Data and Variable Definition

3.2.1 Data.

The section provides information on the data and variable definitions used in the study. The cross-sectional firm-level data used in the study was sourced from the World Bank enterprise survey (WBES) conducted in March 2022. The dataset includes SMEs from both developed and developing economies, making it comprehensive and well-suited for examining the impact of IFRS for SME adoption in developing nations. (World Bank, 2022)

In addition to the primary data, the study also uses five country-level variables, including IFRS for SME data obtained from the IFRS Foundation website. The four other variables used as controls in the analysis are institutional quality (IQ), financial development (FD) index, corruption perception index (CPI), and reports on the observance of codes and standards - accounting and auditing (ROSC-AA) from the World Bank. (IMF, 2021; IFRS Foundation, 2021; Transparency International, 2021; World Bank, 2021)

As noted by Gassen (2017), there is a lack of empirical studies examining the effect of IFRS for SME adoption in developing nations. Therefore, the use of WBES data and additional country-level variables in this study will provide insights into the impact of IFRS for SME adoption in these nations. Additionally, the ROSC-AA project, a collaboration between the IMF and the World Bank, will be used for robustness checks in the study. (Gassen, 2017; IMF, 2021; World Bank, 2021)

Overall, the use of the WBES data and the additional country-level variables provides a robust foundation for examining the impact of IFRS for SME adoption on financing for SMEs in developing nations.

3.2.2 Variable Definition.

In this chapter, the dependent variables used to measure the impact of IFRS for SME adoption on financing are defined based on questions from the World Bank enterprise survey (WBES). The use of these variables has been motivated by past studies that have found them to be effective measures of financing behavior for SMEs (Alquist et al., 2019; Fang et al., 2015; Khawaja et al., 2019; Murro and Peruzzi, 2019a; Murro and Peruzzi, 2019b; Rij and Zellweger, 2019; Yi et al., 2018).

The first three dependent variables are working capital (WC) financed through banks, WC financed through trade credit, and fixed capital (FC) financed through banks. These variables are generated from specific WBES questions as follows:

WC financed through banks - generated from WBES question K3BC, "what is the percentage of working capital borrowed from banks in the last fiscal year?"

WC financed through trade credit - generated from WBES question K5BC, "in the last financial year, what percentage of fixed assets was funded by bank borrowing?"

FC financed through banks - generated from WBES question K3F, "What is the percentage of working capital purchased on credit/advances from suppliers/customers in the last financial year?".

Two alternative dependent variables, active credit, and overdraft facility are also used in the study. Active credit is generated from WBES question K8, "Does the establishment have a line of credit or loan from a financial institution?" Overdraft facility is derived from WBES question K7, "Does this establishment have an overdraft facility?" The use of these variables is motivated by previous studies that have found them to be reliable measures of bank financing for SMEs (Beck et al., 2006; Ullah, 2020a). It is important to note that the definitions of these variables are based on the responses of the survey participants.

The main variable of interest in the study is the adoption of IFRS for SMEs, which is a dummy variable taking a value of 1 if a country has adopted the standard and 0 otherwise. The study also examines two additional dimensions of IFRS adoption: the legal mandate of IFRS for SMEs and the experience of using the standard. The legal mandate variable is a dummy variable that takes a value of 1 if a country legally requires SMEs to report under the IFRS for SME framework, and 0 if the framework is optional. The IFRS for SME experience variable is a continuous variable measuring the length of time a country has been using the IFRS for SME framework, calculated as the difference between the survey year and the year in which the IFRS for SMEs were established in the country. The use of these variables is informed by prior research that has explored the impact of IFRS adoption on SMEs (Gassen, 2017).

The study also examines the interaction effects between IFRS for SMEs and two other variables: external audit and institutional quality. External audit is used as a proxy for financial credibility and is a dummy variable indicating whether the financial statements of a firm were checked and certified by an external auditor in the previous year. The study uses institutional

quality as a composite index constructed from the World Governance Indicators (WGI) using principal component analysis (PCA) dimension reduction method. The index includes six dimensions of governance: voice and accountability, political stability, government effectiveness, control of corruption, rule of law, and regulatory quality. The use of these variables is based on past studies that have found them to be significant determinants of SME financing and IFRS adoption (Alquist et al., 2019; He et al., 2014; Soderstrom and Sun, 2007). For a more comprehensive understanding of these variables and their operationalization, readers are encouraged to refer to Chapter 1, section 1.5.

Six firm-level variables derived from the WBES are used as controls in the study. These include subsidiary status, ownership concentration, female ownership, foreign ownership, manager experience, and international standard certification (ISC). Additionally, the study controls for size, industry, and year effects.

3.3 Research Methodology

The use of a Tobit model in this study is motivated by the censored nature of the dependent variables, which are continuous but limited at zero. This methodology has been widely used in previous studies examining the relationship between IFRS adoption and financing for SMEs (Ullah 2020a; Yi et al. 2018). The Tobit model is well-suited for modeling censored continuous data and is consistent with the assumptions of normality and homoscedasticity (Baum 2006).

Prior to the estimation of the Tobit model, a Pearson correlation test is conducted to detect the presence of multicollinearity in the data. The use of this statistical test is in line with previous studies that have employed it to detect multicollinearity in cross-sectional firm-level data (Yi et al. 2018). To adjust for the issue of multiple comparisons, Bonferroni adjustment is used to calculate significance levels.

The baseline model is estimated according to the specification in Equation 3.1, which includes the dependent variables, independent variables, and control variables. The methodology used in this study builds on previous literature and is appropriate for the research question at hand.

Equation 3.1

$$Financing_{i,t} = isc_{i,j,t} + subsid_{i,j,t} + own\_conc_{i,j,t} + Fem\_own_{i,j,t} + For\_own_{i,j,t} + mgr\_exp_{i,j,t} + \acute{\varepsilon}_{i,j,t}$$

(Eq.3.1)

In Equation 3.1, the dependent variable, financing, represents the primary source of SMEs' external capital, specifically working capital financed through banks, working capital financed through trade credit, and fixed capital financed through banks. Each of the three variables has been shown to be significant in terms of their impact on SME financing and performance in previous literature (Beck et al. 2006; Alquist et al. 2019). The use of three separate models allows for the examination of the effect of IFRS adoption on each form of financing.

The inclusion of the control variables is based on previous studies that have identified their significance in SME financing decisions. For example, the binary variable ISC indicates whether an SME holds an international standard certificate and is included as a control due to its impact on informational asymmetry and subsequent increase in credit access (Ullah 2020a). Subsid is a dummy variable that indicates whether an SME is a subsidiary of a larger organization, which is included as it is associated with higher access to formal credit (Alquist et al. 2019).

Ownership concentration, represented by Own_conc, is included as a continuous variable due to its association with a higher preference for debt financing through corporate bond issuance and commercial bank loans (Khawaja et al. 2019). Fem_own, a binary variable, is included to control for the effects of ownership by gender. Lenders may have business loans that specifically target women to increase financial inclusion, but studies find that female-owned SMEs experience higher credit constraints in certain contexts (Chundakkadan and Sasidharan 2021; Morsy 2020). For_own is a continuous variable indicating the proportion of ownership by foreign entities, which is included to control for the potential influence of foreign institutional investors on IFRS adoption and subsequent financing decisions (He et al. 2014; Alquist et al. 2019). Mgr_exp, a continuous variable, is included as a control due to its association with a higher likelihood of negotiating better credit terms (Beck et al. 2006). The industry and year dummies control for size, industry, and year effects, which have been shown to have a significant impact on SME capital financing decisions (Gopalan and Sasidharan 2020; Ullah 2020a).

In the second model, Equation 3.2, the independent variables of interest, IFRS adoption and its moderators, external audit, and institutional quality, are introduced. The inclusion of these variables is based on previous studies that have shown their significance in SME financing decisions. External audit, represented by Ext_audit, is used as a proxy for financial credibility and is included due to its association with increased bank credit access (Yi et al. 2018).

Institutional quality, represented by IQ, is a composite variable constructed from the World Governance Indicators (WGI) using principal component analysis (PCA) dimension reduction method. It is included as previous studies have found a significant positive relationship between institutional quality and SME access to finance (Klapper et al. 2006; Berger and Udell 2002).

In summary, the model specifications and independent variables were chosen based on previous literature and are aimed at providing insight into the effect of IFRS for SME adoption on financing decisions in developing countries.

Equation 3.2

$$Financing_{i,t} = IFRS \ for \ SMEs_{y,t} + Ext\_aud_{i,j,t} + IQ_{Y,t} + firm_{i,j,t} + \acute{\varepsilon}_{i,j,t} \qquad \text{(Eq. 3.2)}$$

To examine the potential interaction effects between IFRS for SME, external audit, and institutional quality (IQ), the study estimates three separate models, as outlined in Equation 3.3. In each model, the dependent variable, financing, pertains to either working capital (WC) financed through banks, WC financed through trade credit, or fixed capital financed through banks.

To build up to the subsequent models, the variables outlined in Equation 3.2 are employed as a foundation. First, the study analyses the two-way interaction effects between IFRS for SME and external audit, IFRS for SME * voluntary_aud, IFRS for SME and IQ, IFRS for SME * IQ, IQ and external audit, and IQ* voluntary_aud. These interaction effects allow for a more nuanced understanding of the relationship between IFRS adoption and financing for SMEs.

Second, the study evaluates the three-way interaction effects between IFRS for SME, external audit, and IQ, IFRS for SME * voluntary_aud* IQ. These interaction effects enable a more comprehensive assessment of the impact of IFRS adoption on financing for SMEs in the presence of external audit and institutional quality.

Overall, the three models allow for a thorough investigation of the effect of IFRS adoption on financing for SMEs, considering the potential influence of external audit and institutional quality.

Equation 3. 3

$$Financing_{i,t} = IFRS \ for \ SMEs_{y,t} + voluntary\_aud_{i,j,t} + IFRS \ for \ SMEs_{y,t} * voluntary\_aud_{i,j,t} + IQ_{Y,t} +$$
$$IFRS \ for \ SMEs_{y,t} * IQ_{Y,t} + IQ_{Y,t} * voluntary\_aud_{i,j,t} + IFRS \ for \ SMEs_{y,t} * voluntary\_aud_{i,j,t} * IQ_{Y,t} + firm_{i,j,t} +$$

$\acute{\varepsilon}_{i,j,t}$

(Eq.3.3)

To further test the robustness of the results, the study employs alternative variables of interest and dependent variables. The IFRS for SME adoption variable is replaced with two alternative variables of interest: IFRS for SME legal mandate and IFRS for SME experience. The IFRS for SME legal mandate variable is a binary variable that takes a value of 1 if a country legally requires SMEs to use the IFRS for SME framework for their financial reporting, and 0 if the framework is optional. On the other hand, IFRS for SME experience is a continuous variable that measures the length of time since the adoption of IFRS for SME in a country, calculated as the difference between the survey year and the year in which the IFRS for SME framework was established in the country. These variables are substituted for the variable of interest, IFRS for SME adoption, as specified in the model in EQ. 3.3.

Moreover, two alternative dependent variables are used: active credit and overdraft facility. Active credit is a binary variable indicating whether an SME has a loan or a line of credit, with a value of 1 representing having a loan or line of credit and 0 otherwise. Overdraft facility is a binary variable indicating whether an SME has an overdraft facility, with a value of 1 representing having an overdraft facility and 0 otherwise. Since these variables are binary, a Tobit model is unsuitable for analysis. Instead, a binomial Probit model is used as a common estimator for binary-choice models, assuming normal distributed errors. The study also considers the binomial Logit model, which assumes a logistic distribution of errors. Both models are comparable, and the study estimates a binomial Probit model as specified in EQ. 3.4 and a binomial Logit model as specified in EQ. 3.5 to test the robustness of the results.

Overall, the use of alternative variables of interest and dependent variables, as well as the use of different models, provides a rigorous testing of the study's findings and enhances the robustness of the results.

Equation 3.4

$Active\ credit_{i,t} = IFRS\ for\ SMEs_{y,t} + voluntary\_aud_{i,j,t} + IFRS\ for\ SMEs_{y,t} * voluntary\_aud_{i,j,t} + IQ_{Y,t} + IFRS\ for\ SMEs_{y,t} * IQ_{Y,t} + IQ_{Y,t} * voluntary\_aud_{i,j,t} + IFRS\ for\ SMEs_{y,t} * voluntary\_aud_{i,j,t} * IQ_{Y,t} + firm_{i,j,t} + \acute{\varepsilon}_{i,j,t}$

(Eq. 3.4)

Equation 3.5

$Overdraft_{i,t} = IFRS\ for\ SMEs_{y,t} + voluntary\_aud_{i,j,t} + IFRS\ for\ SMEs_{y,t} * voluntary\_aud_{i,j,t} + IQ_{Y,t} + IFRS\ for\ SMEs_{y,t} * IQ_{Y,t} + IQ_{Y,t} * voluntary\_aud_{i,j,t} + IFRS\ for\ SMEs_{y,t} * voluntary\_aud_{i,j,t} * IQ_{Y,t} + firm_{i,j,t} +$

$\acute{\varepsilon}_{i,j,t}$

(Eq. 3.5)

In addition to the country's adoption of IFRS for SME, there are other factors that could affect SME credit, such as institutional quality within a country (Beck et al. 2006; Chen et al. 2019; Gassen 2017; Kersten et al. 2017; Quartey et al. 2017; Tawiah and Gyapong 2021; Zhan et al. 2016a). However, institutional quality can also influence the adoption of IFRS for SME by a country (Soderstrom and Sun 2007; Tawiah and Gyapong 2021).

To ensure that the results are not affected by reverse causality, the study estimates two equations using the conditional mixed process (CMP) framework (Roodman 2011). The CMP framework is ideal for this study because it accommodates interdependent equations, allowing for multi-equation and mixed process models, regardless of the dependent variable being binary, continuous, ordered, or truncated.

Roodman (2011) suggests that CMP can fit many seemingly unrelated (SUR), simultaneous, and instrumental (IV) models, providing more flexibility than other models. The model also permits an endogenous independent variable in one model to function as a dependent variable in a separate model through recursive arrangement. If the correlation coefficient between the error terms of the two equations is statistically significant, the model is superior to a single equation model. Thus, the endogeneity test proposed for the study is a Tobit-Probit CMP model.

The first model has three continuous dependent variables: financing of WC-banks, WC-trade credit, and FC-banks. Therefore, a Tobit model is used. In the second model, the dependent variable is binary, IFRS for SME, and a Probit model is appropriate for the estimation. This approach allows for the simultaneous estimation of the factors that affect SME credit and adoption of IFRS for SME. The conditional mixed process (CMP) Tobit-Probit model used in this study is specified in EQ. 3.6 and EQ. 3.7 below (Kersten et al. 2017). The model includes the endogenous variable IFRS for SME adoption, and the exogenous variable institutional quality. EQ. 3.6 specifies the Tobit model, which estimates the continuous dependent variable, financing, while EQ. 3.7 specifies the Probit model, which estimates the binary dependent variable, IFRS for SME adoption.

Equation 3.6

$$Financing_{i,t} = IFRS\ for\ SMEs_{y,t} + voluntary\_aud_{i,j,t} + IFRS\ for\ SMEs_{y,t} * voluntary\_aud_{i,j,t} + IQ_{Y,t} +$$
$$IFRS\ for\ SMEs_{y,t} * IQ_{Y,t} + IQ_{Y,t} * voluntary\_aud_{i,j,t} + IFRS\ for\ SMEs_{y,t} * voluntary\_aud_{i,j,t} * IQ_{Y,t} + firm_{i,j,t} +$$
$$\acute{\varepsilon}_{i,j,t}$$

(Eq. 3.6)

Equation 3.7

$$IFRS\ for\ SMEs_{y,t} = IQ_{Y,t} + ROSC - AA_{Y,t} + \acute{\varepsilon}_{i,j,t}$$
(Eq. 3.7)

The study uses the CMP Tobit-Probit model, as specified in EQ. 3.6 and EQ. 3.7, to test the hypotheses. In EQ. 3.6, the dependent variable, financing, represents the financing of WC-banks, WC-trade credit, and FC-banks. Previous studies have shown that factors such as institutional quality can affect SME credit (Beck et al. 2006; Chen et al. 2019; Gassen 2017; Kersten et al. 2017; Quartey et al. 2017; Tawiah and Gyapong 2021; Zhan et al. 2016a). Therefore, to account for the endogeneity between institutional quality and IFRS for SME adoption, the model includes firm controls, industry effects, and year effects. The variable of interest is IFRS for SME, representing the adoption of the IFRS for SME by a country. The moderators are voluntary_aud, a dummy variable indicating whether an SME has had its financial statements audited, and IQ, a continuous variable indicating an index of institutional quality in a country at time t. Two-way interactions between IFRS for SME and voluntary_aud, IFRS for SME and IQ, and IQ and voluntary_aud, as well as a three-way interaction between IFRS for SME, voluntary_aud, and IQ, are included in the model.

In EQ. 3.7, IFRS for SME is the endogenous variable, and institutional quality (IQ) and report on observance of standards and code - accounting and auditing (ROSC-AA) are used as independent variables. Institutional quality is associated with IFRS adoption, as shown in previous studies (Soderstrom and Sun 2007; Tawiah and Gyapong 2021). The variable ROSC-AA is a continuous variable that represents the number of reports available for a specific country within the sample period. The data in the ROSC-AA provides a comparative analysis of a country's national accounting practices with the IFRS, highlighting the key areas of divergence. These reports are then used to offer support to countries that have a large deviation from international standards to improve national standards, thus aligning them to the IFRS. The variable ROSC-AA is used in the study, in line with Tawiah and Gyapong (2021).

3.4 Results

3.4.1 Descriptive statistics.

The sample used in this study ranges from 2009 to 2021, which coincides with the publication of the IFRS for SME by the IASB in 2009. A total of 147,983 observations from 153 countries are included in the analysis. Table 3.1 displays summary statistics for the key variables in the study. The results indicate that SMEs in the sample tend to use a mix of internal funds, banks, non-bank financial institutions, trade credit, and informal sources to finance their working capital (WC) and fixed capital (FC). Specifically, WC is primarily financed through banks and trade credit, while FC is primarily financed through banks. On average, 13% of WC is financed through banks, 9.9% through trade credit, and 18.2% of FC is financed through banks. 36.4% of SMEs have an active credit, while 41.9% have an overdraft facility. With regards to the variable of interest, 27% of the SMEs in the sample are from countries that have adopted the IFRS for SME, and 31.4% of these SMEs are in countries that mandate the use of IFRS for SME. The average IFRS for SME experience is 3 years, with a range of 0 to 11 years, indicating that the sample includes both early and later adopters of the standards. 52.4% of SMEs in the sample have an external audit of their financial statements, while the institutional quality (IQ) of the countries in the sample averages 0.48, indicating that most of the SMEs are from countries with a low IQ.

The sample also shows that an average of 24.7% of SMEs have an internationally recognized standard certificate (ISC), and most of the SMEs surveyed are small, with high ownership concentration (80%). The average of female ownership in SMEs is 33.6%, while an average of 7.9% of SMEs have some foreign ownership, and an average of 17.9% of the SMEs are subsidiaries of larger firms. The average experience level of the top manager is 18 years. The sample consists of mostly countries with high corruption, as the average Corruption Perception Index (CPI) is 0.38, indicating high corruption. The financial development averages 34.1%, indicating financial underdevelopment. On average, 30.8% of the countries surveyed have a report by the World Bank on the observance of standards and codes–accounting and auditing (ROSC-AA).

Table 3.1: Summary descriptive statistics

The table provides a summary of the key variables in the sample, including the continuous dependent variables (working capital financed by banks, working capital financed through trade credit, and fixed capital financed through banks), alternative binary dependent variables (active credit and overdraft), and the primary binary variable of interest, IFRS for SME adoption, and the alternative variables of interest, IFRS for SME legal mandate (binary) and IFRS for SME experience (continuous). The table also includes the moderator variables, external audit (binary) and institutional quality (continuous), as well as the firm controls, such as international standards certification (ISC) - binary, SME size - categorical, ownership concentration - continuous, female ownership - binary, foreign ownership - binary, subsidiary status - binary, and manager experience - continuous. Additionally, the country controls are continuous variables, including the Corruption Perception Index (CPI), the index of Financial Development (FD), and the reports on standards and codes - Accounting and Auditing (ROSC-AA). For each variable, the table provides the number of observations, mean statistics, standard deviation, and the range of the data.

Variable	N	Mean	Std. Dev.	Min	Max
Dependent variables					
WC bank	133089	.13	.24	0	1
WC trade credit	133729	.099	.21	0	1
FC bank	59478	.182	.327	0	1
Active credit	143905	.364	.481	0	1
Overdraft	141213	.419	.493	0	1
Variables of interest					
IFRS for SME status	147983	.27	.444	0	1
IFRS for SME mandate	39975	.314	.464	0	1
IFRS for SME experience	36830	3.281	2.905	0	11
External audit	144992	.524	.499	0	1
IQ	147096	.475	.219	.005	.992
Controls					
ISC	143285	.247	.431	0	1
Size	147983	1.737	.766	1	3
Ownership concentration	140677	.796	.262	0	1
Female Ownership	139060	.336	.472	0	1
Foreign Ownership	145633	.079	.252	0	1
Subsidiary status	146478	.179	.384	0	1
Manager experience	143890	18.463	11.39	0	70
CPI	144751	.38	.148	.129	.908
FD	142425	.341	.177	.047	.872
ROSC–AA	147984	.308	.5	0	2

The correlation matrix presented in Table 3.2 displays the correlation coefficients between twenty key variables in the study. The results show that WC-Banks is positively and significantly correlated with FC-Banks, active credit, and overdraft facility at the 1% level, but negatively correlated with WC-Trade credit. IFRS for SME adoption has a positive and significant correlation with WC-Trade credit and FC-Banks, but not with WC-Banks. However, the correlation coefficients between IFRS for SME mandate and WC-Banks, WC-Trade credit, and FC-Banks are positive and significant at the 1% level. IFRS for SME experience has a negative correlation with WC-Banks and WC-Trade credit, but a positive correlation with FC-Banks. External audit is positively and significantly correlated with all dependent variables.

Furthermore, the correlation coefficients between WC-Banks and FC-Banks are positive, while with WC-Trade credit, it is negative. Ownership concentration has a negative and significant correlation with the dependent variables. Female ownership, subsidiary status, and manager

experience are positively and significantly correlated with the main dependent variables. However, foreign ownership is negatively and significantly correlated with WC-Banks and FC-Banks, but positively correlated with active credit and WC-Trade credit. Country CPI, FD, and IQ have a positive and significant correlation with the dependent variables. ROSC-AA has a negative and significant correlation with the dependent variables.

It is worth noting that the correlation coefficients between CPI and FD, CPI and IQ, and FD and IQ are above the threshold of 0.7, indicating a high correlation. To avoid collinearity issues, CPI and FD are dropped from the main model, but used in robustness checks. The correlation coefficients between firm variables are weak or moderate in strength, indicating no collinearity issues with these variables.

Table 3.2: Pearson's' Correlation matrix

The table presents a Pearson's correlation matrix of the key variables in the study. There are nineteen variables, as indicated in the first column. Consequent columns present the pairwise correlation coefficients. The variables are (1) Working Capital (WC) financed through banks, (2) WC -trade credit, (3) Fixed capital (FC) financed through banks, (4) Active credit, (5) Overdraft facility, (6) IFRS for SME country adoption, (7) IFRS for SME legal mandate, (8) IFRS for SME country experience, (9) External Audit, (10) International standard certificate (ISC), (11) Firm Size, (12) Ownership concentration, (13) female ownership, (14) Foreign ownership, (15) Subsidiary status, (16) Manager experience, (17) Corruption perception index (CPI), (18) index of financial development (FD), and (19) institutional quality (IQ), (20) Reports on observance of standards and codes – Accounting and auditing (ROSC-AA). The Asterix * represents significance at the 1% level.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) WC bank	1.000									
(2) WC trade	-0.046*	1.000								
(3) FC bank	0.490*	0.062*	1.000							
(4) Active cred.	0.449*	0.104*	0.402*	1.000						
(5) Overdraft	0.252*	0.093*	0.214*	0.334*	1.000					
(6) IFRS SME	-0.004	0.060*	0.010*	0.001	0.007*	1.000				
(7) IFRS mdt.	0.085*	0.022*	0.082*	0.112*	0.092*		1.000			
(8) IFRS exp.	-0.027*	-0.082*	0.032*	-0.005	-0.058*		-0.113*	1.000		
(9) Ext audit	0.129*	0.013*	0.089*	0.129*	0.183*	-0.042*	-0.027*	0.064*	1.000	
(10) ISC	0.103*	-0.008*	0.051*	0.118*	0.180*	-0.089*	-0.036*	-0.023*	0.228*	1.000
(11) Size	0.141*	0.031*	0.093*	0.198*	0.206*	-0.038*	0.027*	0.027*	0.272*	0.360*
(12) Conc.	-0.083*	-0.064*	-0.072*	-0.109*	-0.122*	0.018*	0.032*	0.029*	-0.152*	-0.126*
(13) Female	0.039*	0.039*	0.030*	0.095*	0.027*	0.054*	-0.005	0.000	0.032*	0.027*
(14) Foreign	-0.035*	0.010*	-0.058*	-0.013*	0.021*	0.033*	0.018*	-0.006	0.125*	0.144*
(15) Subsidiary	0.044*	0.005	0.009*	0.041*	0.099*	0.024*	-0.026*	-0.046*	0.160*	0.148*
(16) Mgt. exp	0.044*	0.067*	0.064*	0.116*	0.122*	-0.024*	0.055*	0.045*	0.083*	0.077*
(17) CPI	0.103*	0.037*	0.109*	0.184*	0.223*	-0.098*	0.178*	-0.041*	0.142*	0.161*
(18) FD	0.089*	0.003	0.100*	0.116*	0.164*	-0.201*	0.061*	-0.124*	0.086*	0.198*
(19) IQ	0.130*	0.040*	0.131*	0.200*	0.211*	-0.138*	0.221*	0.047*	0.111*	0.192*
(20) ROSC	-0.026*	-0.045*	-0.053*	-0.022*	-0.088*	0.188*	0.225*	0.010	-0.144*	-0.091*

Continued

Variables	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(11) Size	1.000									
(12) Conc.	-0.208*	1.000								
(13) female	0.032*	-0.208*	1.000							
(14) Foreign	0.181*	0.032*	-0.027*	1.000						
(15) Subsidiary	0.190*	0.181*	0.012*	0.136*	1.000					
(16) Mgt. exp	0.097*	0.190*	0.064*	-0.031*	0.028*	1.000				
(17) CPI	0.025*	0.097*	0.076*	0.047*	0.057*	0.195*	1.000			
(18) FD	0.082*	0.025*	0.060*	-0.063*	0.030*	0.176*	0.648*	1.000		
(19) IQ	0.080*	0.082*	0.094*	0.003	0.010*	0.173*	0.873*	0.777*	1.000	
(20) ROSC	-0.034*	0.080*	-0.015*	0.001	-0.058*	-0.086*	-0.133*	-0.218*	-0.133*	1.000

* p<0.01

3.4.2 Empirical results.

Table 3.3 presents the results of the empirical analysis. The baseline results indicate that the certification of international standards for banks and trade credit is positively and significantly related to working and fixed capital financing (Ullah, 2020a). The positive effect of certification is stronger for bank financing compared to trade credit. Subsidiary status has a positive impact on WC-banks, but the effect is not statistically significant for WC-trade credit and FC-banks. Ownership concentration has a negative and statistically significant effect on all dependent variables, indicating that higher ownership concentration leads to lower financing through banks and trade credit. Female ownership is positively and significantly related to bank and trade credit financing for both working and fixed capital. Foreign ownership has a negative and statistically significant effect on WC-banks and FC-banks, but the effect is not significant for WC-trade credit, suggesting that foreign-owned firms may finance from internal funds or have access to cheaper alternative sources of credit. The experience level of managers, as measured by years in the industry, has a significant positive impact on WC-trade credit, but the effect is not statistically significant for WC-banks and FC-banks.

The main results suggest that various factors affect SMEs' financing decisions. The adoption of IFRS for SME has a positive impact on bank and trade credit financing, while external audit and institutional quality have a positive impact on bank financing. The positive interaction effect between IFRS for SME and external audit indicates that external audit could enhance the benefits of IFRS for SME in countries with weak regulatory quality. In contrast, the negative interaction effect between IFRS for SME and IQ on trade credit financing may be due to substitution effects and different factors affecting trade credit in high IQ regions. These findings are consistent with prior research on the positive impact of standardization of accounting practices and institutional quality on SME access to bank credit (Alquist et al. 2019; Ayyagari et al. 2017; Beck et al. 2006; Bertrand et al. 2021; Gassen 2017; Kersten et al. 2017; Tawiah and Gyapong 2021; Zhan et al. 2016b) and the positive role of external audit in enhancing bank credit acquisition (Palazuelos et al. 2018; Briozzo and Albanese 2020).

The results have significant implications for SMEs' access to finance and suggest that policy measures aimed at improving financial reporting quality and institutional quality can enhance SME financing.

Table 3.3: IFRSSME adoption, External Audit, and Institutional quality (IQ) effect on SME finance

The table reports the results of Tobit marginal estimates for three dependent variables: working capital (WC) financed by banks, WC financed by trade credit, and fixed capital (FC) financed by banks. The independent variable of interest is a dummy variable representing country adoption status of the IFRS for SME. The index of institutional quality (IQ) is also included as an independent variable, and an interaction term (IFRSSME# IQ) is included to investigate the relationship between IFRS adoption and institutional quality. An additional binary variable, external audit, is included, and an interaction term (IFRSSME# Audit) is used to assess the impact of IFRS adoption and external audit on SME credit. The firm controls included are international standard certification, subsidiary status, ownership concentration, foreign ownership, and manager experience. Size, industry, and year effects are also included in the model. The marginal estimates are reported sequentially as specified in EQ3.1, EQ3.2, and EQ3.3. The dependent variables are continuous, and the results are interpreted as the expected change in the dependent variable associated with a one-unit change in the independent variable while holding other variables constant.

	WC - Banks			WC-Trade credit			FC - Banks		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
IFRSSME		0.028***	-0.037**		0.074***	0.176***		0.073***	-0.236***
		(5.90)	(-2.27)		(15.19)	(10.78)		(6.60)	(-5.84)
External audit		0.106***	0.165***		0.005	0.043***		0.114***	0.272***
		(24.62)	(13.16)		(1.19)	(3.33)		(11.44)	(9.29)
IFRSSME # Audit			0.134***			0.029			0.294***
			(6.06)			(1.29)			(5.75)
Institutional quality (IQ)		0.477***	0.553***		0.248***	0.364***		0.577***	0.741***
		(44.54)	(31.08)		(21.85)	(19.28)		(23.31)	(17.98)
IFRSSME # IQ			0.140***			-0.279***			0.530***
			(4.20)			(-8.23)			(6.53)
IQ # Audit			-0.130***			-0.103***			-0.386***
			(-5.86)			(-4.31)			(-7.88)
IFRSSME #IQ#Audit			-0.265***			0.038			-0.376***
			(-6.12)			(0.86)			(-3.76)
Firm Controls									
ISC	0.092***	0.050***	0.051***	0.009*	-0.006	-0.006	0.076***	0.030***	0.033***
	(19.09)	(10.27)	(10.47)	(1.67)	(-1.03)	(-1.03)	(7.36)	(2.87)	(3.17)
Subsidiary status	0.032***	0.017***	0.017***	-0.004	-0.010*	-0.010*	0.006	-0.004	-0.001
	(6.26)	(3.26)	(3.37)	(-0.67)	(-1.72)	(-1.80)	(0.56)	(-0.32)	(-0.06)
Ownership conc.	-0.099***	-0.075***	-0.070***	-0.082***	-0.076***	-0.075***	-0.115***	-0.092***	-0.080***
	(-13.06)	(-9.86)	(-9.23)	(-10.15)	(-9.36)	(-9.25)	(-6.81)	(-5.40)	(-4.69)
Female ownership	0.046***	0.026***	0.027***	0.025***	0.013***	0.011**	0.021**	0.005	0.004
	(10.68)	(6.20)	(6.30)	(5.53)	(2.95)	(2.49)	(2.28)	(0.54)	(0.46)
Foreign ownership	-0.190***	-0.203***	-0.203***	0.002	-0.001	-0.004	-0.312***	-0.327***	-0.324***
	(-20.68)	(-21.88)	(-21.86)	(0.23)	(-0.07)	(-0.48)	(-16.70)	(-17.37)	(-17.30)
Manager experience	0.001***	0.000	0.000	0.001***	0.001***	0.001***	0.001	-0.000	-0.001
	(6.21)	(0.49)	(0.49)	(7.13)	(5.41)	(5.00)	(1.59)	(-1.24)	(-1.37)
Constant	-0.130***	0.050***	-0.431***	-0.442***	-0.566***	-0.612***	-0.156***	-0.500***	-0.566***
	(-6.91)	(10.27)	(-20.79)	(-21.63)	(-26.73)	(-27.08)	(-4.11)	(-12.44)	(-12.80)
Size effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	113,962	112,130	112,130	114,530	112,699	112,699	50,661	49,959	49,959
Log likelihood	-68439.5	-66130.3	-63692.6	-61103.2	-59851.7	-59774.2	-36089.4	-35342.3	-35224.0
Pseudo R^2	0.0548	0.0736	0.0746	0.0627	0.0684	0.0696	0.0351	0.0441	0.0473

t statistics in parentheses * p<0.10, ** p<0.05, *** p<0.01

3.4.3 Additional Analysis and Robustness.

Robustness analysis using alternative measures of institutional quality.

To further strengthen the robustness of the findings, the study utilizes alternative measures of institutional quality, including the index of financial development (FD) and the corruption perception index (CPI) (Table 3.4). The results show that the coefficients for the main independent variables and their interaction terms remain consistent with those in the main model, indicating that the findings are robust to different measures of institutional quality. The positive and significant effect of IFRS for SME adoption on bank financing of working and fixed capital is still observed, along with the positive interaction effect between IFRS for SME and external audit. Moreover, the positive interaction effect between IFRS for SME and institutional quality is replicated, while the negative interaction effect between IFRS for SME and institutional quality on trade credit financing remains consistent. These results support the generalizability of the findings across different measures of institutional quality (Gassen, 2017; Tawiah and Gyapong, 2021). Previous research has shown that the use of alternative measures of institutional quality, including CPI and FD, can enhance the robustness of findings (Kersten et al., 2017; Alquist et al., 2019). Therefore, the use of different measures of institutional quality lends credibility to the findings of the study.

Table 3.4: IFRSSME adoption, External Audit, and FD/CPI effect on SME finance

Table 3.5 presents Tobit marginal estimates sequentially, baseline and main results, from EQ3.1, EQ3.2, and EQ3.3, to investigate the robustness of the main results to alternative model specifications. The dependent variables are continuous, representing working capital (WC) financed by banks, WC financed by trade credit, and fixed capital (FC) financed by banks. IFRS for SME adoption is a dummy variable representing country adoption status of the standards. External audit is a binary variable for SME engaging with an external auditor. The main independent variable of interest is the interaction between IFRS for SME adoption and institutional quality (IQ). Firm controls include international standard certification (ISC), subsidiary status (binary), ownership concentration, foreign ownership, and manager experience. Size, industry, and year effects are included as additional controls. Panel A investigates the robustness of the main results by replacing the moderator variable, institutional quality (IQ), with financial development (FD). Panel B investigates the robustness of the main results by replacing the moderator variable, institutional quality (IQ), with the level of corruption in a country, as measured by the corruption perception index (CPI). The results show that the main findings are robust to alternative model specifications. The coefficients for the interaction between IFRS for SME adoption and IQ, and the interaction between IFRS for SME adoption and external audit, remain positive and significant in all model specifications. The findings support the notion that the adoption of IFRS for SME can enhance access to bank and trade credit, especially in countries with weak institutional quality or those with institutional voids, and that external audit can provide additional assurance to lenders. The robustness of the findings to alternative model specifications increases confidence in the generalizability of the study results.

	WC - Banks			WC-Trade credit			FC - Banks		
Panel A: FD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
IFRSSME adoption		0.026***	0.042***		0.095***	0.078***		0.069***	-0.148***
		(5.22)	(2.68)		(19.27)	(5.04)		(6.09)	(-3.91)
External audit		0.119***	0.161***		0.008*	0.055***		0.131***	0.250***
		(27.32)	(14.12)		(1.76)	(4.60)		(12.77)	(9.60)
IFRSSME # Audit			0.124***			0.138***			0.299***
			(6.24)			(6.82)			(6.51)
FD		0.424***	0.582***		0.401***	0.545***		0.627***	0.889***
		(27.96)	(25.39)		(25.28)	(22.44)		(17.22)	(15.86)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
IFRSSME # FD			-0.122***			-0.012			0.355***
			(-2.79)			(-0.26)			(3.37)
FD # Audit			-0.157***			-0.180***			-0.482***
			(-5.78)			(-6.09)			(-7.92)
IFRSSME #FD#Audit			-0.280***			-0.323***			-0.415***
			(-5.05)			(-5.60)			(-3.25)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	113,962	108,406	108,406	114,530	108,969	108,969	50,661	48,130	48,130
Log likelihood	-68439.5	-64752	-64639	-61103.2	-57799	-57696	-36089.4	-34307	-34194
Pseudo R^2	0.0548	-64752	0.0676	0.0627	0.0772	0.0739	0.0351	0.0406	0.0438

Panel B. continued next page.

	WC - Banks			WC-Trade credit			FC - Banks		
Panel B: CPI	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
IFRSSME adoption		0.021***	-0.053**		0.069***	0.161***		0.059***	-0.236***
		(4.28)	(-2.37)		(14.11)	(7.24)		(5.34)	(-4.46)
External audit		0.112***	0.215***		0.008*	0.048***		0.127***	0.342***
		(25.90)	(16.31)		(1.81)	(3.47)		(12.55)	(11.28)
IFRSSME # Audit			0.136***			0.072**			0.302***
			(4.73)			(2.47)			(4.63)
CPI		0.565***	0.750***		0.371***	0.519***		0.627***	1.003***
		(36.07)	(28.61)		(22.44)	(18.54)		(17.52)	(17.10)
IFRSSME # CPI			0.178***			-0.316***			0.576***
			(2.99)			(-5.29)			(4.13)
CPI # Audit			-0.285***			-0.143***			-0.645***
			(-9.25)			(-4.32)			(-9.69)
IFRSSME # CPI #Audit			0.314***			-0.066			-0.428**
			(-4.20)			(-0.86)			(-2.55)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	113,962	110,653	110653	114,530	110,427	110,427	50,661	49,321	49,321
Log likelihood	-68439.5	-65569	-65484	-61103.2	-58846	-58782	-36089.4	-34961	-34843
Pseudo R^2	0.0548	0.0694	0.0706	0.0627	0.0672	0.0682	0.0351	0.0415	0.0447

t statistics in parentheses. $p<0.10$, ** $p<0.05$, *** $p<0.01$

Effect of Legal Mandate for SMEs to Use IFRS for SME.

Table 3.5 examines the effect of the legal mandate for SMEs to use IFRS for SME, as a substitution for the adoption variable used in the main analysis. Only 20 out of the 56 countries in the sample have made IFRS for SME mandatory for SMEs (see Appendix A.8). The results show that the legal mandate has no significant effect on WC-banks and FC-banks financing sources, but a negative effect on WC-trade credit financing. However, the analysis reveals that the impact of the IFRS for SME mandate on financing sources is moderated by external audit and institutional quality. The interaction effect between the IFRS for SME mandate and external audit is positive but weak for WC-trade credit and negative but weak for FC-banks

(Briozzo and Albanese, 2020; Palazuelos et al., 2018). The interaction effect between the IFRS for SME mandate and institutional quality is negative and significant for WC-banks, but positive and significant for WC-trade credit (Bertrand et al., 2021; Gassen, 2017; Tawiah and Gyapong, 2021; Zhan et al., 2016a). No significant interaction effect is found for FC-banks.

One possible explanation for these results is the variation in institutional quality across the countries in the sample. It is worth noting that 62.9% of the reports on observance of standards and codes–accounting and auditing (ROSC-AA) were issued in countries that have later mandated the use of IFRS for SME (Ayyagari et al., 2017). The issuance of ROSC-AA reports indicates misalignment with international accounting standards, and countries are advised on how to converge with these standards, which may include the obligation to report under the IFRS for SME framework. In fact, discussions are underway for a World Bank project called REPARIS (The road to Europe: Program of Accounting Reform and Institutional Strengthening), aimed at strengthening the accounting and financial reporting framework in countries such as Kosovo, Serbia, Montenegro, and North Macedonia (World Bank, 2020).

These findings suggest that the legal mandate for SMEs to use IFRS for SME has a limited impact on financing sources, but its effectiveness depends on other institutional factors, such as external audit and institutional quality.

Table 3.5: IFRSSME legal mandate, External Audit, and IQ effect on SME finance

The table reports Tobit marginal estimates sequentially as specified in EQ3.1, EQ3.2, and EQ3.3. The dependent variables are continuous and represent working capital (WC) financed by banks, WC financed by trade credit, and fixed capital (FC) financed by banks. The sample size includes 56 countries, and the study covers the period from 2013 to 2019. IFRS for SME mandate is a dummy variable representing the legal mandate a country has on IFRS for SME. A value of 0 indicates the standards are allowed/permitted, while 1 indicates publishing under the IFRS for SME is mandatory/required. IQ is an index representing a country's institutional quality. IFRS for SME * IQ is an interaction between IFRS for SME mandate and institutional quality. External audit is a binary variable representing SME engagement with an external auditor. IFRS for SME * Audit is an interaction between IFRS for SME mandate and external audit. Firm controls included are international standard certification, subsidiary status (binary), ownership concentration, foreign ownership, and manager experience. Size, industry, and year effects are also included in the analysis.

	(1)	(2)	(3)	(4)	(5)	(6)
	WC-Banks		WC-trade credit		FC-Banks	
IFRSSME -mandate	0.012	0.151***	-0.052***	-0.186***	-0.002	0.172*
	(1.35)	(3.95)	(-5.80)	(-4.77)	(-0.10)	(1.78)
External audit	0.121***	0.282***	0.030***	0.056***	0.226***	0.551***
	(15.15)	(13.96)	(3.85)	(2.88)	(12.29)	(11.85)
IFRSSME # Audit		-0.069		0.139**		-0.295**
		(-1.24)		(2.43)		(-2.23)
IQ	0.568***	0.821***	0.314***	0.358***	1.019***	1.441***
	(19.33)	(20.47)	(11.96)	(9.77)	(16.13)	(15.34)
IFRSSME # IQ		-0.306***		0.204***		-0.241
		(-4.02)		(2.62)		(-1.24)
IQ # Audit		-0.368***		-0.102**		-0.666***
		(-8.76)		(-2.50)		(-6.67)
IFRSSME #IQ#Audit		0.152		-0.157		0.389
		(1.36)		(-1.38)		(1.47)
Firm Controls						
ISC	0.069***	0.069***	0.014	0.015	0.071***	0.070***
	(7.21)	(7.27)	(1.43)	(1.61)	(3.52)	(3.47)
Subsidiary status	-0.019**	-0.020**	-0.026***	-0.026***	-0.034*	-0.033
	(-1.99)	(-2.16)	(-2.82)	(-2.88)	(-1.69)	(-1.63)
Ownership concentration	-0.017	-0.010	-0.144***	-0.141***	-0.019	-0.003

	(-1.12)	(-0.65)	(-9.98)	(-9.77)	(-0.58)	(-0.11)
Female ownership	0.017**	0.017**	0.018**	0.019**	0.017	0.015
	(2.23)	(2.16)	(2.38)	(2.53)	(0.95)	(0.87)
Foreign ownership	-0.165***	-0.169***	-0.027*	-0.029*	-0.337***	-0.339***
	(-10.25)	(-10.52)	(-1.76)	(-1.85)	(-9.64)	(-9.73)
Manager experience	0.000	0.000	0.001***	0.001***	-0.001	-0.001
	(0.42)	(0.61)	(2.72)	(2.87)	(-0.93)	(-0.81)
Constant	-0.417***	-0.539***	-0.063	-0.065	-0.823***	-1.055***
	(-5.56)	(-7.05)	(-1.04)	(-1.04)	(-5.86)	(-7.28)
Size effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
N	30,573	30,573	30,616	30,616	13,455	13,455
Log likelihood	-17658	-17615	-16924	-16908	-9243	-9212
Pseudo R^2	0.0787	0.0810	0.0996	0.1005	0.0806	0.0836

t statistics in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Impact of Length of IFRS for SME Experience on SME Financing Sources.

Table 3.6 presents the results with the variable of interest as the length of IFRS for SME experience within a country. As shown in columns labelled (1), (3), and (5), the effect of IFRS for SME experience on bank financing of working and fixed capital is positive and significant, consistent with the main results (Cai et al. 2014; Houqe and Monem 2016; Tawiah and Gyapong 2021). However, the IFRS for SME experience has a negative and statistically significant impact on trade credit. This finding may suggest that trade credit providers may not value the benefits of IFRS for SME experience or may be unaware of the improvements in financial reporting.

The interaction effects between the IFRS for SME experience with audit and IQ are shown in columns labelled (2), (4), and (6). The interaction effects between the IFRS for SME experience with audit are positive and significant for WC-trade credit but weak and negative on FC-bank credit (Palazuelos et al. 2018; Briozzo and Albanese 2020). This result suggests that longer experience with IFRS for SME and external audit can enhance the value of trade credit. However, it may not significantly affect fixed capital financing through banks. The staggered implementation of the IFRS for SME may also explain the dissimilarities in findings.

Overall, the findings suggest that longer experience with IFRS for SME can have a positive impact on bank financing of working and fixed capital (Cai et al. 2014; Houqe and Monem 2016; Tawiah and Gyapong 2021). However, the impact on trade credit may not be significant, indicating the need for more awareness among trade credit providers about the benefits of IFRS for SME experience.

Table 3.6: Results with the variable of interest as the length of IFRS for SME experience within a country

The table presents Tobit marginal estimates for the dependent variables, which are continuous: working capital (WC) financed by banks, WC financed by trade credit, and fixed capital (FC) financed by banks. The variable of interest is the length of IFRS for SME experience within a country. IQ is an index representing a country's institutional quality. The table also includes interaction effects between IFRS for SME experience and external audit (IFRSSME#Audit) and between IFRS for SME experience and institutional quality (IFRSSME#IQ). Firm controls are included, such as international standard certification, subsidiary status, ownership concentration, foreign ownership, and manager experience. Size, industry, and year effects are also accounted for in the analysis. The results are presented sequentially as specified in EQ3.1, EQ3.2, and EQ3.3.

	(1)	(2)	(3)	(4)	(5)	(6)
	WC-Banks		WC-trade credit		FC-Banks	
IFRSSME experience	0.011***	0.017***	-0.038***	-0.084***	0.031***	0.045***
	(5.04)	(2.84)	(-18.19)	(-14.21)	(6.11)	(3.04)
External audit	0.117***	0.259***	0.045***	-0.006	0.222***	0.584***
	(14.06)	(8.96)	(5.41)	(-0.24)	(11.76)	(8.77)
IFRSSME # Audit		0.003		0.027***		-0.028*
		(0.46)		(3.81)		(-1.67)
IQ	0.615***	0.807***	0.134***	-0.128**	1.096***	1.492***
	(20.75)	(14.60)	(4.82)	(-2.53)	(17.51)	(11.49)
IFRSSME # IQ		-0.001		0.104***		0.000
		(-0.05)		(8.05)		(0.01)
IQ # Audit		-0.212***		0.076		-0.639***
		(-3.69)		(1.44)		(-4.59)
IFRSSME #IQ#Audit		-0.037**		-0.051***		0.009
		(-2.51)		(-3.39)		(0.24)
Firm Controls						
ISC	0.071***	0.071***	-0.004	-0.002	0.079***	0.081***
	(7.14)	(7.26)	(-0.34)	(-0.17)	(3.82)	(3.94)
Subsidiary status	-0.014	-0.017*	-0.019*	-0.014	-0.026	-0.031
	(-1.39)	(-1.70)	(-1.91)	(-1.46)	(-1.25)	(-1.47)
Ownership concentration	-0.028*	-0.021	-0.135***	-0.132***	-0.054	-0.037
	(-1.82)	(-1.35)	(-8.81)	(-8.61)	(-1.60)	(-1.09)
Female ownership	0.012	0.014*	0.016**	0.016**	0.010	0.010
	(1.54)	(1.76)	(1.99)	(2.04)	(0.56)	(0.54)
Foreign ownership	-0.169***	-0.171***	-0.025	-0.026	-0.348***	-0.349***
	(-10.18)	(-10.29)	(-1.50)	(-1.60)	(-9.72)	(-9.80)
Manager experience	0.000	0.000	0.001**	0.001**	-0.001	-0.001
	(0.14)	(0.56)	(2.35)	(2.06)	(-0.99)	(-0.78)
Constant	-0.413***	-0.533***	-0.020	0.111*	-0.860***	-1.089***
	(-5.47)	(-6.71)	(-0.32)	(1.69)	(-6.05)	(-7.10)
Size effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
N	28,948	28,948	28,974	28,974	12,877	12,877
Log likelihood	-16703	-16655	-15912	-15873	-8798	-8770
Pseudo R^2	0.0810	0.0836	0.1075	0.1097	0.0861	0.0890

t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01

Robustness analysis of IFRS for SME using alternative measures of financing: Active Credit and Overdraft

Table 3.7 presents the results estimated using a binomial Probit model with two panels, with active credit and overdraft as dependent variables in Panel A and Panel B, respectively. The independent variables include IFRS for SME adoption, mandate, and experience, as well as the interaction effects with external audit and institutional quality.

The results indicate that IFRS for SME adoption, mandate, and experience have a positive and significant impact on active credit (Panel A). This finding is consistent with prior research that suggests that standardized financial reporting enhances the ability of lenders to evaluate the creditworthiness of borrowers, thereby increasing access to credit (Gassen, 2017; Ayyagari et al., 2017). Furthermore, the interaction effects with external audit and institutional quality are positive and significant, suggesting that these factors can enhance the benefits of IFRS for SME adoption on active credit.

In Panel B, only IFRS for SME adoption has a positive impact on overdraft, while longer experience with IFRS for SME is associated with lower overdraft. This result suggests that the effects of IFRS for SME on overdraft may depend on the duration of the adoption.

The interaction effects with external audit and institutional quality are also positive and significant for overdraft, indicating that these factors can moderate the effects of IFRS for SME adoption on overdraft. This finding is in line with prior studies that highlight the positive role of external audit and institutional quality in enhancing SME access to bank credit (Beck et al., 2006; Palazuelos et al., 2018; Briozzo and Albanese, 2020).

In summary, the results suggest that IFRS for SME adoption, mandate, and experience can have a positive impact on active credit and overdraft, but the effects may vary depending on the duration of adoption and other institutional factors such as external audit and institutional quality.

Table 3.7: IFRSSME, External Audit, and IQ effect on active credit and overdraft

Table 3.7 presents Probit coefficient estimates sequentially, with two panels for active credit and overdraft (O/D) as the dependent variables. The effects of IFRS for SME adoption, IFRS for SME mandate, and IFRS for SME experience are reported in both panels. IFRS for SME adoption and mandate are binary variables representing country adoption and legal requirement of the standards, respectively. IFRS for SME experience indicates the length of use of the standards. IQ is an index representing a country's institutional quality. External audit is a binary variable for SMEs engaging with an external auditor. Firm controls include international standard certification, subsidiary status, ownership concentration, foreign ownership, and manager experience. Size, industry, and year effects are also included.

Panel A: EQ. 3.4		IFRSSME Adoption		IFRSSME Mandate		IFRSSME Experience	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
		Active credit		Active credit		Active credit	
IFRSSME		0.035***	0.101***	0.084***	0.177**	0.033***	0.057***
		(3.64)	(3.02)	(4.52)	(2.33)	(7.02)	(4.46)
External audit		0.218***	0.292***	0.260***	0.462***	0.245***	0.638***
		(25.88)	(12.05)	(15.35)	(10.60)	(13.92)	(9.83)
IFRSSME # Audit			0.155***		-0.182		-0.059***
			(3.43)		(-1.59)		(-3.85)
Institutional quality (IQ)		1.113***	1.267***	1.244***	1.471***	1.471***	1.820***
		(52.23)	(36.77)	(21.06)	(17.46)	(24.49)	(15.19)
IFRSSME # IQ			-0.154**		-0.101		-0.024
			(-2.22)		(-0.66)		(-0.88)
IQ # Audit			-0.160***		-0.380***		-0.658***
			(-3.66)		(-4.04)		(-4.89)
IFRSSME			-0.293***		0.163		0.070**

#IQ#Audit			(-3.23)		(0.72)		(2.18)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	123,375	121,535	121,535	31,401	31,401	29,750	29,750
Log likelihood	-74403	-71655	-71611	-17896	-17880	-16841	-16814
Pseudo R^2	0.0856	0.1072	0.1077	0.1326	0.1334	0.1416	0.1430
Panel B: EQ. 3.5		IFRSSME Adoption		IFRSSME Mandate		IFRSSME Experience	
	(O/D)	(O/D)	(O/D)	(O/D)	(O/D)	(O/D)	(O/D)
IFRSSME		0.051***	-0.257***	-0.014	-0.228***	-0.028***	0.027**
		(5.20)	(-7.54)	(-0.75)	(-2.87)	(-6.01)	(2.03)
External audit		0.231***	0.431***	0.340***	0.440***	0.339***	0.493***
		(27.46)	(17.92)	(19.53)	(9.25)	(18.67)	(6.72)
IFRSSME # Audit			0.092**		0.454***		0.026
			(1.97)		(3.84)		(1.51)
Institutional quality (IQ)		1.444***	1.572***	1.958***	1.994***	2.039***	2.681***
		(66.76)	(45.76)	(33.20)	(23.21)	(33.92)	(21.41)
IFRSSME # IQ			0.650***		0.574***		-0.116***
			(9.26)		(3.65)		(-4.01)
IQ # Audit			-0.424***		-0.103		-0.174
			(-9.76)		(-1.02)		(-1.16)
IFRSSME #IQ#Audit			-0.142		-1.213***		-0.100***
			(-1.52)		(-5.19)		(-2.84)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	120,956	119,150	119,150	29,962	29,962	28,287	28,287
Log likelihood	-74448	-70600	-70452	-16709	-16679	-15651	-15603
Pseudo R^2	0.0948	0.1290	0.1309	0.1813	0.1828	0.1890	0.1915

t statistics in parentheses

* $p<0.10$, ** $p<0.05$, *** $p<0.01$

Endogeneity check: CMP results on IFRS for SME adoption and financing.

The results from the endogeneity check using the CMP Tobit-Probit model suggest that the adoption of IFRS for SME is influenced by both institutional pressures and concerns about the potential dilution of local standards. Countries that have had reports on observance of standards and codes–accounting and auditing (ROSC-AA) issued by the World Bank have a higher adoption rate and a higher legal mandate for IFRS for SME, indicating the influence of institutional pressures (Boolaky et al. 2020). On the other hand, countries with higher institutional quality may have a lower adoption rate due to concerns about dilution of local standards (Kaya and Koch 2015).

Despite the potential for reverse causality, the main findings regarding the impact of IFRS for SME on financing remain robust. The interaction effects between IFRS for SME adoption and external audit are positively and significantly associated with bank financing of working and fixed capital, and weakly significant but positive for trade credit financing. The interaction effect between IFRS for SME adoption and institutional quality is positive and significant for bank financing of working and fixed capital but negative and significant for trade credit financing of working capital (Table 3.8).

These findings suggest that IFRS for SME adoption can enhance SME financing, and the interaction with external audit and institutional quality can enhance the benefits of IFRS for SME adoption. However, the effect of IFRS for SME adoption on trade credit financing may be weaker, and the impact may depend on institutional quality.

Table 3.8: Endogeneity test: Tobit-Probit conditional mixed process (CMP) results

The table presents CMP estimates from EQ. 3.7 and EQ. 3.8. The dependent variables are continuous; Working capital (WC) financed by banks (1), WC financed by Trade credit (2), and fixed capital (FC) financed by banks (3). IFRS for SME adoption is a dummy variable representing country adoption of IFRS for SME. IQ is an index representing a country's institutional quality. IFRS for SME * IQ is an interaction between IFRS for SME adoption and institutional quality. External audit is a binary variable for SME engaging with an external auditor. IFRS for SME * Audit is an interaction between IFRS for SME adoption and external audit. ROSC-AA is a continuous variable representing the number of reports on observance of codes and standards - accounting and auditing issued in a country during the sample period. ISC is international standard certification of a firm, subsidiary status is binary, ownership concentration, foreign ownership, and manager experience are continuous. Size, industry, and year effects are included in the model. The table also presents the coefficient correlation between the error terms of the financing and IFRS for SME adoption equations, labeled atanhrho_12. The results indicate that the model is appropriately specified and suggest that reverse causality is not a significant concern.

	(1)	(2)	(3)
EQ. 3.7	WC - banks	WC–trade credit	FC - banks
IFRSSME adoption	-0.057***	0.023***	-0.109***
	(-6.82)	(3.56)	(-6.80)
External audit	0.040***	0.007**	0.056***
	(9.62)	(1.99)	(6.19)
IFRSSME #Audit	0.037***	0.017**	0.058***
	(4.78)	(2.47)	(3.65)
institutional quality	0.127***	0.089***	0.183***
	(20.54)	(16.52)	(13.78)
IFRSSME # IQ	0.068***	-0.078***	0.084***
	(5.80)	(-7.66)	(3.27)
IQ # Audit	-0.011	-0.027***	-0.081***
	(-1.49)	(-4.01)	(-5.20)
IFRSSME #IQ#Audit	-0.068***	-0.002	-0.014
	(-4.38)	(-0.15)	(-0.41)
Firm controls			
ISC	0.017***	-0.006***	0.004
	(9.04)	(-3.76)	(1.26)
Subsidiary	0.008***	-0.003	-0.000
	(4.13)	(-1.59)	(-0.13)
Ownership concentration	-0.024***	-0.018***	-0.026***
	(-8.40)	(-7.52)	(-4.48)
Female ownership	0.007***	0.003**	-0.002
	(4.61)	(2.43)	(-0.51)
Foreign ownership	-0.067***	0.004	-0.091***
	(-21.45)	(1.31)	(-16.18)
Manager experience	0.000	0.000***	-0.000
	(0.41)	(7.19)	(-0.32)
Size dummies	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes
Year effects	Yes	Yes	Yes
Constant	0.134***	0.060***	0.183***
	(16.01)	(8.47)	(11.43)
EQ. 3.8	IFRS for SME adoption	IFRS for SME adoption	IFRS for SME adoption
IQ	-0.765***	-0.764***	-0.764***
	(-45.25)	(-45.22)	(-45.24)
Reports on ROSC - AA	0.442***	0.443***	0.443***
	(65.08)	(65.14)	(65.19)
Constant	-0.408***	-0.408***	-0.408***
	(-45.16)	(-45.23)	(-45.21)
lnsig_1			
Constant	-1.460***	-1.593***	-1.133***
	(-646.24)	(-734.95)	(-318.77)

atanhrho_12			
Constant	0.080***	0.061***	0.129***
	(4.29)	(3.95)	(5.38)
Observations	147095	147095	147095
Log likelihood	-77739	-62855	-96584

t statistics in parentheses * p<0.10, ** p<0.05, *** p<0.01

The Effect of Firm Size on Financing: Subsample Analysis

Access to financing is a significant challenge for small and medium-sized enterprises (SMEs), which face more constraints in accessing external credit compared to their larger counterparts (Beck et al. 2005; Bertrand et al. 2021). This is due to various factors, such as the inadequacy of collateral, higher perception of risk, and greater information asymmetry with lenders (Abdulsaleh and Worthington 2013; Facundo and Schmukler 2017; Hasan et al. 2021; Kersten et al. 2017). To further explore these differences, this study conducts a subsample analysis based on SME size to examine the impact of IFRS for SME adoption, mandate, and experience on SME finance, considering the variations in financing based on firm size. Figure 3.1 illustrates the variations in financing based on SME size, showing that small SMEs tend to have lower bank financing of working and fixed capital and lower trade credit financing compared to larger SMEs.
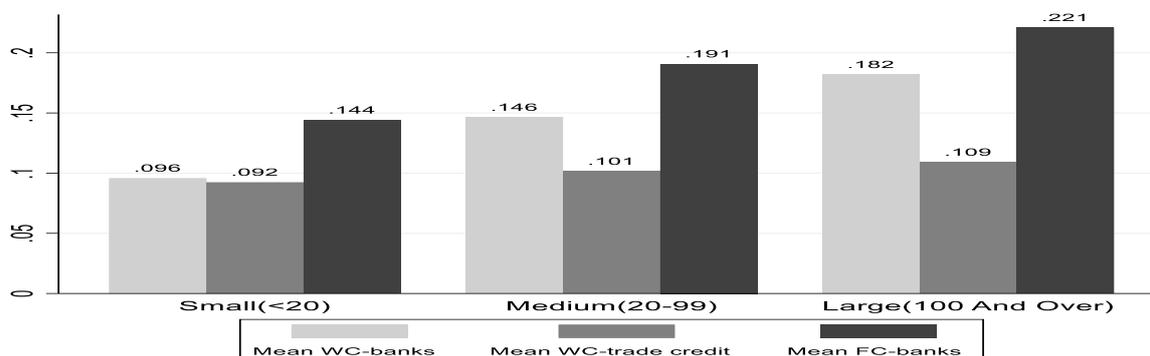
Figure 3.1: SME financing based on size.

Table 3.9 provides empirical evidence on the effects of IFRS for SME adoption on SME financing by size. The results indicate that the impact of IFRS for SME adoption on financing varies by firm size. The interaction effects between IFRS for SME adoption and audit suggest that small and medium-sized SMEs have a higher access to bank credit, while the impact is positive but weak for trade credit on medium-sized SMEs. This suggests that IFRS adoption could help alleviate finance constraints for smaller firms that face higher obstacles in accessing finance if they voluntarily use external audits. Furthermore, the interaction effects between IFRS for SME adoption and IQ show a positive and significant impact on bank credit financing

of working and fixed capital. However, the interaction effect is negative and significant for trade credit financing of working capital for small and medium-sized SMEs. This implies that IFRS adoption could potentially have a negative impact on small and medium-sized SMEs' access to trade credit.

To support the findings of the impact of IFRS adoption on SME financing, several studies have found that smaller firms face more constraints in accessing external credit compared to their larger counterparts (Beck et al. 2005; Bertrand et al. 2021). This can be attributed to various factors, such as the inadequacy of collateral, higher perception of risk, and greater information asymmetry with lenders (Abdulsaleh and Worthington 2013; Facundo and Schmukler 2017; Hasan et al. 2021; Kersten et al. 2017). Additionally, previous research has also found that the adoption of international financial reporting standards can enhance the transparency and comparability of financial information, leading to an increase in credit access (Cormier et al. 2018; Duro and Jorge 2015). However, the effectiveness of IFRS adoption may vary by firm size, as smaller firms may face greater challenges in meeting the compliance costs of adopting IFRS (Ball et al. 2003; McNichols et al. 2010). These arguments support the need to consider firm size when assessing the impact of IFRS for SME adoption on SME financing, as demonstrated in the sub sample analysis.

Table 3.9: IFRSSME adoption, External Audit, and IQ effect on SME finance: Size effect

The table reports Tobit marginal estimates sequentially, based on SME size. The dependent variables are continuous; Working capital financed by banks, working capital financed by Trade credit, fixed capital financed by banks. IFRSSME adoption is the variable of interest. It is a dummy variable representing country adoption of the standards .IQ is an index representing a country's institutional quality. Voluntary audit is a binary variable for SME engaging with an external auditor. Firm controls are included; these are international standard certification, subsidiary status, ownership concentration, foreign ownership, and manager experience. Size, industry, and year effects are included.

	WC-banks			WC-trade credit			FC-Banks		
	(small)	(medium)	(large)	(small)	(medium)	(large)	(small)	(medium)	(large)
Adoption	-0.004	-0.112***	0.029	0.201***	0.131***	0.140**	-0.267***	-0.278***	0.019
	(-0.16)	(-3.83)	(0.60)	(9.29)	(4.35)	(2.41)	(-4.32)	(-4.03)	(0.18)
external audit	0.156***	0.091***	0.179***	0.095***	0.020	0.002	0.305***	0.193***	0.209***
	(7.66)	(4.39)	(5.61)	(4.92)	(0.89)	(0.05)	(5.98)	(4.04)	(3.00)
IFRSSME #Audit	0.173***	0.180***	0.014	0.003	0.079**	0.095	0.231***	0.430***	0.020
	(4.73)	(4.82)	(0.25)	(0.08)	(2.05)	(1.47)	(2.61)	(5.03)	(0.16)
IQ	0.683***	0.415***	0.397***	0.390***	0.377***	0.317***	0.906***	0.661***	0.507***
	(26.06)	(13.55)	(7.57)	(15.22)	(11.09)	(5.37)	(14.26)	(9.70)	(4.40)
IFRSSME # IQ	0.126***	0.243***	-0.073	-0.317***	-0.217***	-0.131	0.592***	0.587***	0.106
	(2.59)	(4.17)	(-0.78)	(-6.89)	(-3.56)	(-1.19)	(4.78)	(4.24)	(0.50)
IQ # Audit	-0.066*	-0.018	-0.202***	-0.181***	-0.100**	0.029	-0.378***	-0.272***	-0.276**
	(-1.87)	(-0.50)	(-3.51)	(-5.09)	(-2.46)	(0.45)	(-4.54)	(-3.39)	(-2.23)
IFRSSME #IQ#Audit	-0.331***	-0.358***	0.056	0.070	-0.008	-0.227*	-0.183	-0.658***	0.044
	(-4.69)	(-4.93)	(0.54)	(1.01)	(-0.11)	(-1.85)	(-1.08)	(-3.91)	(0.19)

N	52,887	38,503	20,740	53,238	38,633	20,828	17,975	18,894	13,090
Log likelihood	-28110	-24116	-13301	-27777	-20593	-11095	-11275	-13683	-10075
Pseudo R^2	0.0554	0.0521	0.0644	0.0591	0.0721	0.0992	0.0504	0.0362	0.0420

t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01

To support the findings, prior research has suggested that the benefits of external audit in enhancing access to finance for SMEs are dependent on firm size (Mensah and Agyei 2021; Fungáčová et al. 2019). Furthermore, the negative relationship between institutional quality and access to bank finance for small firms is consistent with prior research, which suggests that higher institutional quality may be associated with more stringent lending criteria and higher financing costs (Ayyagari et al. 2011; Sufian and Chong 2014). Conversely, the positive relationship between institutional quality and access to trade credit for small SMEs aligns with the notion that suppliers may be more willing to extend trade credit to firms in countries with better institutional quality, as such countries may have more stable and reliable economic environments (Zhou et al. 2019). Overall, the results suggest that the impact of IFRS for SME mandate on SME financing may vary by firm size, and that external audit and institutional quality may play a moderating role.

Table 3.10: IFRSSME Mandate, External Audit, and IQ effect on SME finance: Size effect

The table reports Tobit marginal estimates sequentially, based on SME size, with the variable of interest being IFRS-SME mandate. The dependent variables are continuous; Working capital financed by banks, working capital financed by trade credit, and fixed capital financed by banks. The IFRS-SME mandate variable is a dummy variable indicating the legal requirement of the IFRS for SME reporting framework; Mandatory (1), permitted/allowed (0). The institutional quality (IQ) is a country-level index. The voluntary audit is a binary variable indicating whether an SME engages with an external auditor. Firm controls include international standard certification, subsidiary status, ownership concentration, foreign ownership, and manager experience. Size, industry, and year effects are included.

	WC-banks			WC-trade credit			FC-Banks		
Mandate	0.138**	0.094	0.258**	-0.250***	-0.051	-0.263**	0.348**	-0.009	-0.272
	(2.38)	(1.53)	(2.45)	(-4.71)	(-0.74)	(-2.22)	(2.37)	(-0.06)	(-1.09)
external audit	0.317***	0.228***	0.213***	0.068**	0.087***	0.053	0.568***	0.574***	0.178
	(9.61)	(6.70)	(4.39)	(2.30)	(2.66)	(0.92)	(7.37)	(7.24)	(1.62)
IFRSSME #Audit	0.046	-0.079	-0.138	0.238**	0.037	0.122	-0.545**	-0.100	0.262
	(0.48)	(-0.88)	(-1.11)	(2.56)	(0.39)	(0.89)	(-2.28)	(-0.47)	(0.92)
IQ	1.043***	0.664***	0.440***	0.283***	0.454***	0.449***	1.969***	1.073***	0.489**
	(17.40)	(9.69)	(4.49)	(5.49)	(6.90)	(4.10)	(14.06)	(6.40)	(2.22)
IFRSSME # IQ	-0.303***	-0.164	-0.506**	0.336***	-0.021	0.184	-0.791***	0.359	0.710
	(-2.63)	(-1.33)	(-2.41)	(3.14)	(-0.16)	(0.79)	(-2.68)	(1.16)	(1.41)
IQ # Audit	-0.395***	-0.312***	-0.230**	-0.088	-0.138**	-0.239**	-0.604***	-0.681***	-0.077
	(-5.75)	(-4.38)	(-2.46)	(-1.39)	(-2.02)	(-2.19)	(-3.62)	(-3.91)	(-0.35)
IFRSSME #IQ#Audit	-0.074	0.194	0.293	-0.433**	0.004	0.128	0.835*	-0.083	-0.605
	(-0.39)	(1.09)	(1.19)	(-2.31)	(0.02)	(0.47)	(1.74)	(-0.19)	(-1.06)
N	15,393	10,194	4,986	15,407	10,208	5,001	5,421	4,931	3,103
Log likelihood	-8264	-6061	-3088	-8406	-5616	-2778	-3175	-3476	-2446
Pseudo R^2	0.0682	0.0682	0.0643	0.0811	0.1127	0.1365	0.0936	0.0702	0.0683

t statistics in parentheses * p<0.10, ** p<0.05, *** p<0.01

Table 3.11 presents the results with IFRS for SME experience as the variable of interest. The dependent variables are continuous and include bank financing of working capital, trade credit financing of working capital, and fixed capital financing by banks. The results are consistent with prior research that suggests that the length of IFRS adoption has a positive impact on access to external finance (Houqe and Monem 2016; Tawiah and Gyapong 2021). Specifically, the findings indicate that the interaction effects between IFRS for SME experience and external audit are positive and significant in working capital financing of small-sized SMEs, which is consistent with prior research (Barth et al. 2008). Additionally, the interaction effect between IFRS for SME experience and institutional quality is positive and significant for small SMEs, while negative but weakly significant for medium-sized and large SMEs. This finding is consistent with prior research suggesting that institutional quality has a greater impact on small firms (Hasan et al. 2021). Finally, the interaction effect between IFRS for SME experience and institutional quality is positive and significant on trade credit financed working capital for small and medium-sized SMEs, indicating that higher institutional quality can improve access to trade credit, especially for smaller firms (Berger and Udell 2006).

Table 3.11: IFRSSME experience, External Audit, and IQ effect on SME finance: Size effect

The table reports Tobit marginal estimates sequentially, based on SME size. The dependent variables are continuous; Working capital financed by banks, working capital financed by Trade credit, fixed capital financed by banks. IFRS for SME experience is the variable of interest. It represents the length of use of the standards. IQ is an index representing a country's institutional quality. Voluntary audit is a binary variable for SME engaging with an external auditor. Firm controls are included; these are international standard certification, subsidiary status, ownership concentration, foreign ownership, and manager experience. Size, industry, and year effects are included.

	WC-banks			WC-trade credit			FC-Banks		
Experience	-0.001	0.031***	0.052***	-0.108***	-0.062***	-0.035*	0.048**	0.021	0.073*
	(-0.08)	(2.96)	(3.17)	(-13.26)	(-5.90)	(-1.89)	(2.10)	(0.80)	(1.89)
external audit	0.300***	0.229***	0.289***	-0.022	0.061	0.088	0.484***	0.636***	0.510***
	(6.32)	(4.63)	(4.16)	(-0.54)	(1.40)	(1.10)	(4.40)	(5.49)	(3.03)
IFRSSME #Audit	0.002	-0.003	-0.029*	0.034***	0.008	-0.002	-0.001	-0.024	-0.082**
	(0.19)	(-0.24)	(-1.73)	(3.05)	(0.69)	(-0.11)	(-0.03)	(-0.81)	(-2.00)
IQ	0.861***	0.799***	0.659***	-0.393***	0.099	0.228*	1.871***	1.212***	1.034***
	(9.81)	(8.67)	(5.22)	(-5.21)	(1.14)	(1.67)	(8.69)	(5.28)	(3.45)
IFRSSME # IQ	0.053***	-0.041**	-0.080**	0.165***	0.055**	0.006	0.009	0.037	-0.077
	(2.64)	(-1.96)	(-2.55)	(8.84)	(2.46)	(0.17)	(0.17)	(0.67)	(-1.01)
IQ # Audit	-0.181*	-0.200**	-0.316***	0.188**	-0.092	-0.175	-0.260	-0.738***	-0.633**
	(-1.80)	(-2.07)	(-2.64)	(2.18)	(-1.05)	(-1.29)	(-1.07)	(-2.99)	(-2.05)
IFRSSME #IQ#Audit	-0.051**	-0.023	0.040	-0.080***	-0.001	0.004	-0.067	-0.007	0.132
	(-1.97)	(-0.95)	(1.21)	(-3.30)	(-0.02)	(0.09)	(-1.02)	(-0.12)	(1.59)
N	14,495	9,663	4,790	14,505	9,669	4,800	5,149	4,716	3,012
Log likelihood	-7754	-5730	-2957	-7803	-5296	-2672	-2971	-3324	-2375
Pseudo R^2	0.0699	0.0712	0.0673	0.0929	0.1198	0.1398	0.0974	0.0709	0.0716

t statistics in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Taken together, these findings suggest that IFRS for SME, adoption, mandate, and experience, when combined with external audit and higher institutional quality, can have a positive impact on external credit acquisition for small firms compared to their larger counterparts. These results highlight the need for policymakers to focus on improving institutional quality and promoting the adoption of IFRS for SME reporting by small and medium-sized firms.

The Effect of regional heterogeneity: Subsample Analysis

The regional analysis presented in Figure 3.2 shows that there are significant differences in SME financing across regions. Previous studies have highlighted that regional disparities in financial development and access to finance can have a significant impact on SME financing (Ayyagari et al. 2011; Demirguc-Kunt and Maksimovic 1998; Kuntchev et al. 2005). For instance, SMEs in the SAR region tend to have higher access to bank financing of WC compared to those in the MNA region. This may be attributed to the fact that the banking sector is more developed in the SAR region compared to the MNA region (World Bank 2021). Similarly, SMEs in LAC tend to have higher access to bank financing of FC compared to those in EAP. This may be due to the fact that LAC countries have more advanced financial systems compared to those in the EAP region (Beck et al. 2011).
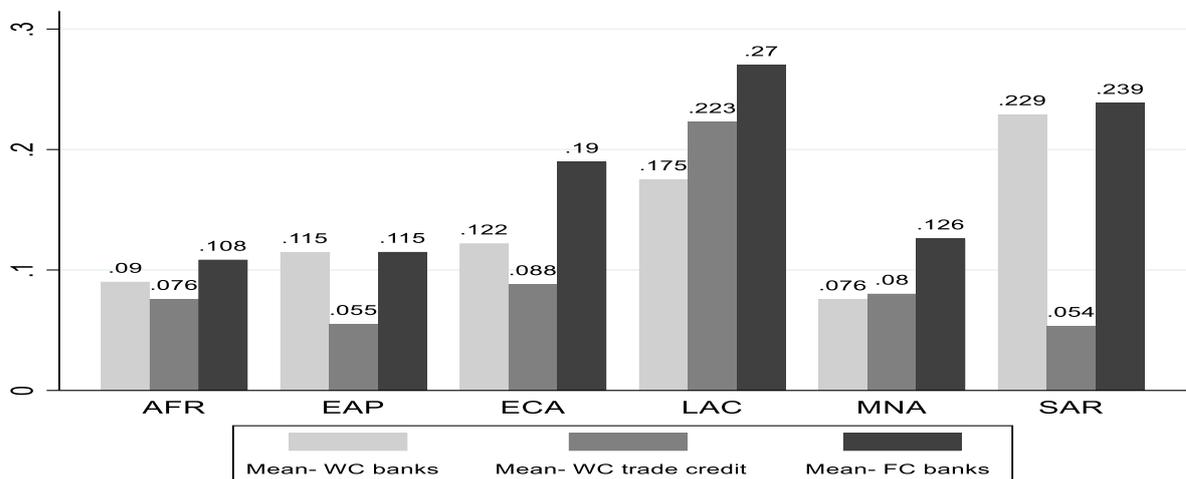
Figure 3.2: SME financing based on geographic region.

Figure 3.3 depicts the adoption and legal mandate rates of IFRS for SMEs across different regions. Regional differences in the adoption and legal mandate rates of IFRS for SMEs can be influenced by various factors. For instance, a study by García-Sánchez and Noguera-Gámez

(2018) found that the adoption of IFRS for SMEs is positively associated with financial development. Countries with well-developed financial systems tend to adopt IFRS for SMEs to attract foreign investments and increase transparency in financial reporting. In addition, a study by Obi (2019) showed that institutional quality plays a crucial role in IFRS adoption. Countries with strong institutional quality tend to adopt and implement international accounting standards to promote transparency, accountability, and good governance. This is in line with the findings of the present study, where the interaction effect between IFRS for SME adoption and institutional quality is positive and significant for bank financing of working and fixed capital.

Moreover, the differences in adoption and legal mandate rates of IFRS for SMEs across regions can be attributed to economic growth. As the economy grows, SMEs become more complex and may require a more sophisticated financial reporting system. Therefore, countries with high economic growth rates tend to adopt IFRS for SMEs (García-Sánchez and Noguera-Gámez 2018). Additionally, countries that are part of international organizations or trade blocs tend to adopt IFRS for SMEs to align their financial reporting with international standards (Obi 2019).

In summary, the regional differences in the adoption and legal mandate rates of IFRS for SMEs can be influenced by various factors such as financial development, institutional quality, and economic growth. These differences highlight the importance of considering regional characteristics when assessing the impact of IFRS for SME adoption on SME financing.
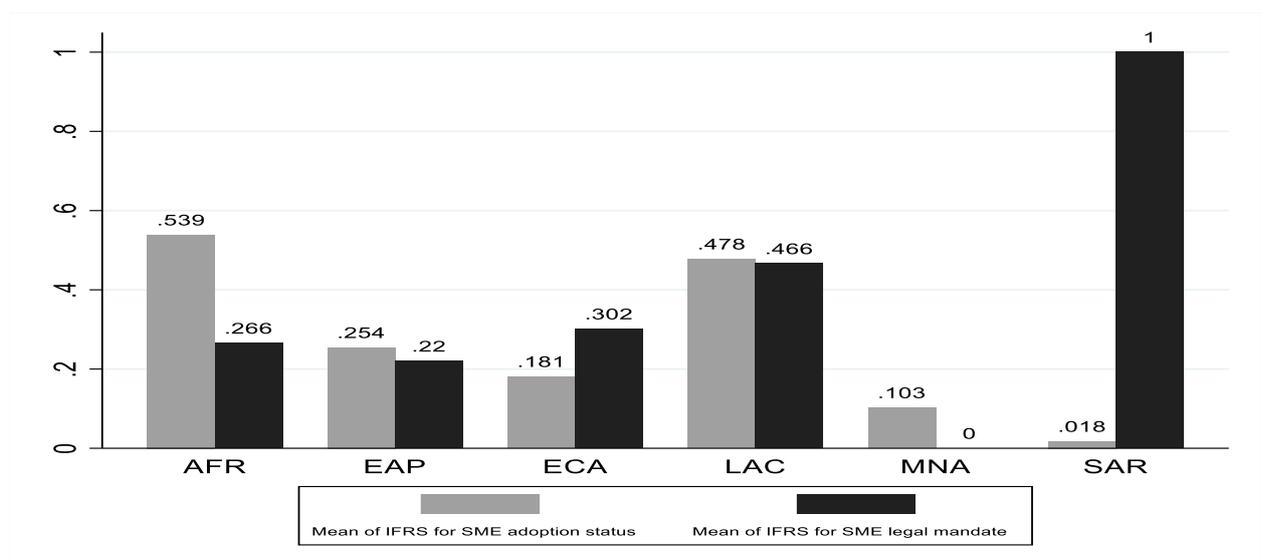
Figure 3.3: IFRS for SME adoption and mandate by region

Table 3.12 presents empirical evidence on the impact of IFRS for SME adoption, mandate, and experience on bank-financed working capital for the six regions. The findings suggest that the adoption of IFRS for SME can benefit SMEs in regions with high credit access obstacles, such as AFR, provided they have external audits. Studies indicate that external audits can enhance the credibility of financial reports and increase the likelihood of obtaining credit from lenders (Beck et al. 2015; Moradi-Motlagh and Ashrafi 2017). In ECA and LAC, SMEs have higher access to bank credit with the condition of having external audits. These results are consistent with previous studies that show that high levels of institutional quality are associated with a greater likelihood of financial institutions offering credit (Beck et al. 2006a; Hanousek and Shamshur 2010b).

The interaction effect between IFRS for SME and institutional quality (IQ) is found to be positive and significant for small and medium-sized enterprises (SMEs) in the Europe and Central Asia (ECA) region, indicating that higher institutional quality in the region may increase SMEs' access to finance through bank financing of working capital. This finding is consistent with previous studies that have established the role of institutional quality in promoting financial development (La Porta et al. 1998; Masoud et al. 2021).

The mandatory use of IFRS for SME, coupled with audits, increases access to credit for SMEs in AFR. This result suggests that a legal requirement of IFRS for SME reporting combined with external audits could improve the creditworthiness of SMEs in regions with weaker financial development. Additionally, the interaction effects between IFRS for SME adoption and IQ are positive and significant for bank-financed working capital, which implies that higher institutional quality is associated with greater access to bank credit in most regions. However, the interaction effects for the IFRS for SME experience are not significant across regions. The absence of significant results may suggest that the impact of IFRS for SME experience on financing varies less across regions than adoption or mandate, implying a more uniform impact of experience across different regions.

Overall, the results suggest that the impact of IFRS for SME-on-SME financing differs by region, and that external audits and institutional quality are important moderators of this relationship.

Table 3.12: IFRSSME, External Audit, and IQ effect on bank-financed WC: Regional Effect

The table presents Tobit marginal estimates based on region (AFR, EAP, ECA, LAC, and MNA). The dependent variable is continuous and represents working capital financed by banks. The independent variables are IFRS-SME adoption, a dummy variable representing country adoption of the standards; IFRS-SME mandate, indicating the legal requirement of the standards (Mandatory=1, permitted/allowed=0); and IFRS-SME experience, representing the length of use of the standards. The index of institutional quality (IQ) represents a country's institutional quality, and external audit is a binary variable representing SME engagement with an external auditor. The firm controls include international standard certification, subsidiary status, ownership concentration, foreign ownership, and manager experience. The size, industry, and year effects are also included in the model.

Panel A.	AFR	EAP	ECA	LAC	MNA
IFRSSME adoption	0.039	0.069	-0.123***	0.201***	-0.377
	(0.92)	(1.16)	(-3.35)	(3.92)	(-1.63)
External audit	0.266***	0.132**	0.244***	0.063**	0.241***
	(6.15)	(2.36)	(9.86)	(1.96)	(4.77)
IFRSSME #Audit	-0.117**	-0.157*	0.194***	-0.082	0.902***
	(-2.08)	(-1.89)	(3.91)	(-1.44)	(3.51)
Institutional quality (IQ)	0.811***	0.407***	0.318***	-0.044	1.634***
	(6.68)	(4.56)	(11.37)	(-0.91)	(14.32)
IFRSSME # IQ	0.174	-0.065	0.280***	-0.276***	0.113
	(1.16)	(-0.60)	(3.72)	(-2.91)	(0.30)
IQ # Audit	-0.288*	-0.137	-0.291***	-0.031	-0.400***
	(-1.72)	(-1.27)	(-7.90)	(-0.53)	(-3.40)
IFRSSME #IQ#Audit	0.503***	0.180	-0.483***	0.212*	-1.316***
	(2.59)	(1.23)	(-5.01)	(1.91)	(-3.22)
N	15,158	14,334	38,748	18,396	13,046
Log likelihood	-7221	-7857	-22892	-11754	-5194
Pseudo R^2	0.1047	0.0901	0.0441	0.0382	0.1840
Panel B:	AFR	EAP	ECA	LAC	
IFRSSME mandate	-0.249**	-0.107*	-0.094	0.777***	
	(-2.54)	(-1.70)	(-1.22)	(6.05)	
External audit	0.041	0.202***	0.390***	0.059	
	(0.93)	(3.11)	(7.08)	(1.14)	
IFRSSME #Audit	0.601***	-0.482	-0.402***	-0.440***	
	(5.28)	(-1.62)	(-3.53)	(-3.04)	
Institutional quality (IQ)	0.801***	2.138***	0.287**	-0.264***	
	(5.39)	(12.19)	(2.37)	(-2.91)	
IFRSSME # IQ	0.586**	0.000	0.330**	-1.433***	
	(2.52)	(.)	(2.01)	(-5.80)	
IQ # Audit	0.722***	-0.099	-0.665***	0.053	
	(4.45)	(-1.07)	(-5.52)	(0.51)	
IFRSSME #IQ#Audit	-1.514***	1.068	0.758***	0.827***	
	(-5.87)	(1.05)	(3.34)	(2.92)	
N	9,851	3,033	7,887	8,460	
Log likelihood	-4868	-1423	-4384	-5511	
Pseudo R^2	0.1131	0.1835	0.0623	0.0393	
Panel C.	AFR	EAP	ECA	LAC	
IFRSSME experience	0.050**	-0.035	0.074***	-0.033	
	(2.42)	(-0.52)	(4.74)	(-1.60)	
External audit	0.034	-0.502*	0.270**	-0.092	
	(0.70)	(-1.71)	(2.55)	(-1.04)	
IFRSSME #Audit	0.024*	0.136**	-0.003	0.017	
	(1.87)	(2.40)	(-0.15)	(0.73)	
Institutional quality (IQ)	0.052	0.946	0.975***	-0.564***	
	(0.29)	(0.81)	(5.87)	(-3.59)	
IFRSSME # IQ	0.078**	0.000	-0.067*	0.041	
	(2.48)	(.)	(-1.94)	(0.95)	
IQ # Audit	0.930***	0.804**	-0.366	0.404**	
	(5.24)	(2.18)	(-1.52)	(2.38)	
IFRSSME #IQ#Audit	-0.135***	-0.212***	-0.005	-0.053	
	(-4.12)	(-2.83)	(-0.11)	(-1.05)	
N	9,706	2,925	7,887	7,987	
Log likelihood	-4793	-1340	-4353	-5247	
Pseudo R^2	0.1148	0.1840	0.0690	0.0396	

t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01

The results in Table 3.13 reveal that the impact of IFRS for SME on access to trade credit for SMEs is region-specific and contingent on the legal requirements of the standards, institutional quality, and external audit. The interaction effect between the length of IFRS for SME mandate and external audit is significant for WC financed through trade credit for SMEs in AFR. This implies that the legal requirement of the standards in combination with external audits can help alleviate finance constraints for small firms in this region. The interaction effects between the IFRS for SME mandate and IQ are also significant for SMEs in AFR and LAC. This suggests that higher institutional quality can facilitate access to trade credit for SMEs in these regions. These results are consistent with the findings of prior studies that institutional quality is a critical determinant of SME financing (Beck et al. 2005; Hasan et al. 2021).

However, the interaction effects of IFRS for SME adoption and experience with external audit and IQ are not statistically significant for any of the regions. This suggests that the adoption of the standards and longer experience with them may not be sufficient to facilitate access to trade credit for SMEs. Therefore, policymakers in different regions should consider adopting and mandating the standards while ensuring that the legal requirements are coupled with external audits and institutional quality to facilitate access to trade credit for SMEs.

Table 3.13: IFRSSME, External Audit, and IQ effect on trade credit-financed WC: Regional Effect

The table presents the empirical results of the impact of IFRS for SME, adoption (panel A.), mandate (Panel B.), and experience (Panel C.) on trade credit-financed working capital for the regions. The interaction effect between the length of IFRS for SME mandate and external audit is positive and significant on WC financed through trade credit for SMEs in AFR. The interaction effects between the IFRS for SME mandate and IQ are also positive and significant for SMEs in AFR and LAC.

Panel A.	AFR	EAP	ECA	LAC	MNA
IFRSSME adoption	0.130***	0.244***	0.032	0.287***	0.683**
	(4.41)	(3.20)	(0.66)	(5.85)	(2.18)
External audit	0.214***	0.145**	0.034	-0.033	0.026
	(7.44)	(2.09)	(1.05)	(-1.03)	(0.72)
IFRSSME #Audit	-0.268***	-0.381***	0.013	0.051	0.743**
	(-6.55)	(-3.45)	(0.20)	(0.91)	(2.23)
Institutional quality (IQ)	-0.078	0.542***	0.587***	-0.010	0.838***
	(-0.90)	(4.58)	(16.97)	(-0.21)	(9.13)
IFRSSME # IQ	-0.274**	-0.264*	-0.147	-0.310***	-1.275**
	(-2.46)	(-1.90)	(-1.48)	(-3.41)	(-2.43)
IQ # Audit	-0.783***	0.026	-0.053	0.103*	-0.109
	(-6.43)	(0.19)	(-1.10)	(1.73)	(-1.15)
IFRSSME #IQ#Audit	1.035***	0.152	0.173	-0.109	-1.029*
	(6.90)	(0.80)	(1.36)	(-1.02)	(-1.87)
N	15,960	14,339	38,774	18,403	13,057
Log likelihood	-7522	-5786	-20313	-12548	-6380
Pseudo R^2	0.0634	0.0756	0.0287	0.0273	0.0448
Panel B:	AFR	EAP	ECA	LAC	
IFRSSME mandate	-0.275***	-0.628***	-0.207*	0.261**	
	(-3.33)	(-8.57)	(-1.85)	(2.02)	
External audit	-0.175***	0.038	0.063	0.002	
	(-4.33)	(0.53)	(0.83)	(0.03)	
IFRSSME #Audit	0.294***	0.441	-0.099	0.185	
	(2.77)	(1.22)	(-0.62)	(1.27)	

Institutional quality (IQ)	-1.434***	2.062***	0.552***	-0.167**
	(-8.26)	(11.67)	(3.39)	(-2.11)
IFRSSME # IQ	1.362***	0.000	0.229	-0.516**
	(6.38)	(.)	(0.99)	(-2.07)
IQ # Audit	0.961***	-0.034	-0.007	0.059
	(5.72)	(-0.34)	(-0.04)	(0.66)
IFRSSME #IQ#Audit	-1.117***	-2.285*	0.401	-0.429
	(-4.30)	(-1.94)	(1.28)	(-1.51)
N	9,855	3,034	7,905	8,466
Log likelihood	-4725	-1194	-3874	-5533
Pseudo R^2	0.0750	0.1718	0.0400	0.0397
Panel C.	AFR	EAP	ECA	LAC
IFRSSME experience	0.045***	-0.548***	-0.048**	-0.081***
	(2.60)	(-7.51)	(-2.40)	(-4.15)
External audit	-0.219***	0.031	0.017	-0.083
	(-5.33)	(0.09)	(0.13)	(-1.04)
IFRSSME #Audit	0.057***	-0.002	0.018	0.016
	(5.12)	(-0.03)	(0.67)	(0.70)
Institutional quality (IQ)	-1.208***	-9.159***	0.275	-0.714***
	(-7.82)	(-6.95)	(1.34)	(-5.12)
IFRSSME # IQ	0.046*	0.000	0.057	0.117***
	(1.67)	(.)	(1.20)	(2.82)
IQ # Audit	0.949***	-0.026	0.267	0.200
	(5.92)	(-0.06)	(0.86)	(1.32)
IFRSSME #IQ#Audit	-0.187***	0.004	-0.063	-0.030
	(-5.90)	(0.05)	(-0.98)	(-0.62)
N	9,710	2,925	7,905	7,993
Log likelihood	-4677	-1152	-3873	-5354
Pseudo R^2	0.0728	0.1716	0.0403	0.0454

t statistics in parentheses.   * $p<0.10$, ** $p<0.05$, *** $p<0.01$

The findings from Table 3.14, which shows the impact of IFRS for SME on bank financing of fixed capital, indicate that the interaction effects on fixed capital are not significant for the regions. This may be due to the lower sample size of SMEs that use bank credit for fixed capital, which may have influenced the outcome. Moreover, previous studies have highlighted that SMEs face several challenges in accessing long-term financing, such as the high cost of borrowing, lack of collateral, and limited access to equity markets (Maddala et al. 2017; Zazzaro 2019). These constraints may explain the lower uptake of bank credit for fixed capital by SMEs, particularly in less developed regions. Therefore, more research is needed to explore the impact of IFRS for SME on fixed capital financing and the factors that influence SMEs' decisions to use bank credit for long-term investments.

Table 3.14: IFRSSME, External Audit, and IQ effect on bank-financed FC: Regional Effect

The table reports Tobit marginal estimates based on the five regions: AFR, EAP, ECA, LAC, and MNA. The dependent variable is continuous: fixed capital financed by banks. The study investigates the impact of IFRS for SME adoption, mandate, and experience on fixed capital financing. IFRS-SME adoption is a binary variable representing country adoption of the standards. IFRS-SME mandate indicates the legal requirement of the standards – Mandatory (1) or permitted/allowed (0), and IFRS experience represents the length of use of the standards. IQ is an index representing a country's institutional quality. External audit is a binary variable for SME engaging with an external auditor. Firm controls are included, such as international standard certification, subsidiary status, ownership concentration, foreign ownership, and manager experience. Size, industry, and year effects are also included in the model. However, due to a lower sample size of SMEs that use bank credit for fixed capital, the interaction effects on fixed capital are not significant for the regions in the table.

Panel A:	AFR	EAP	ECA	LAC	MNA
IFRSSME adoption	-0.141	0.261*	-0.176*	0.180	0.131
	(-1.36)	(1.66)	(-1.92)	(1.41)	(0.25)
External audit	0.312***	0.188	0.311***	0.001	0.365***
	(3.05)	(1.54)	(6.23)	(0.01)	(2.98)
IFRSSME #Audit	-0.054	-0.098	0.115	0.036	0.048
	(-0.42)	(-0.53)	(0.98)	(0.26)	(0.09)
Institutional quality (IQ)	0.724**	0.804***	0.552***	0.006	1.618***
	(2.13)	(3.48)	(9.29)	(0.05)	(5.58)
IFRSSME # IQ	0.627	-0.434	0.343*	-0.479**	-0.175
	(1.56)	(-1.51)	(1.93)	(-1.99)	(-0.21)
IQ # Audit	-0.274	-0.064	-0.402***	-0.048	-0.743**
	(-0.65)	(-0.27)	(-5.40)	(-0.34)	(-2.56)
IFRSSME #IQ#Audit	0.832*	0.060	-0.251	0.252	-0.140
	(1.70)	(0.17)	(-1.15)	(0.91)	(-0.16)
N	6,082	5,894	21,361	9,926	3,208
Log likelihood	-3089	-3281	-15405	-8249	-1754
Pseudo R^2	0.1197	0.0620	0.0358	0.0282	0.1043
Panel B:	AFR	EAP	ECA	LAC	
IFRSSME mandate	0.501**	-0.578***	-0.212	0.795**	
	(2.51)	(-2.78)	(-1.08)	(2.36)	
External audit	0.104	0.165	0.417***	0.167	
	(1.10)	(1.04)	(3.08)	(1.31)	
IFRSSME #Audit	0.368	-1.005	-0.859***	-0.882**	
	(1.60)	(-1.06)	(-3.12)	(-2.55)	
Institutional quality (IQ)	1.652***	2.183***	-0.005	-0.202	
	(5.17)	(4.65)	(-0.02)	(-0.89)	
IFRSSME # IQ	-1.440***	0.000	0.844**	-1.499**	
	(-2.78)	(.)	(2.07)	(-2.30)	
IQ # Audit	1.023***	0.007	-0.555*	-0.004	
	(2.97)	(0.03)	(-1.93)	(-0.01)	
IFRSSME #IQ#Audit	-1.383**	3.219	1.360***	1.629**	
	(-2.34)	(1.09)	(2.59)	(2.39)	
N	4,120	1,184	3,354	4,406	
Log likelihood	-2136	-554	-2203	-3733	
Pseudo R^2	0.1610	0.1571	0.0410	0.0355	
Panel C.	AFR	EAP	ECA	LAC	
IFRSSME experience	0.131***	-0.875***	0.109***	0.055	
	(2.68)	(-3.73)	(2.67)	(1.06)	
External audit	0.168	0.066	0.598**	0.241	
	(1.61)	(0.08)	(2.27)	(1.12)	
IFRSSME #Audit	0.004	-0.019	-0.069	-0.085	
	(0.12)	(-0.12)	(-1.32)	(-1.46)	
Institutional quality (IQ)	0.713*	-13.542***	1.502***	-0.098	
	(1.72)	(-3.36)	(3.56)	(-0.26)	
IFRSSME # IQ	-0.068	0.000	-0.115	-0.125	
	(-0.71)	(.)	(-1.33)	(-1.15)	
IQ # Audit	1.186***	-0.068	-1.074*	-0.122	
	(2.91)	(-0.07)	(-1.87)	(-0.29)	
IFRSSME #IQ#Audit	-0.132	0.252	0.143	0.162	
	(-1.36)	(1.18)	(1.26)	(1.31)	
N	4,038	1,123	3,354	4,189	
Log likelihood	-2123	-499	-2208	-3560	
Pseudo R^2	0.1516	0.1575	0.0388	0.0363	

t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01

Impact of IFRS for SME on Financing by Country Income Group: Subsample Analysis.
The classification of countries into geographic groups may lead to biased results due to the heterogeneity of economic and financial development levels within the same region (World Bank 2022a). To address this, an additional analysis is performed based on the economic income level of countries using the gross national income (GNI) per capita classification provided by the World Development Indicators (WDI) (World Bank 2022b).

Figure 3.4 illustrates that SMEs in upper-middle-income and high-income countries have higher access to bank and trade credit financing compared to SMEs in low-income and lower-middle-income countries. This finding is consistent with previous studies that have shown that financial development and economic growth are positively associated with access to external finance (Beck et al. 2005; Demirgüç-Kunt and Maksimovic 2001; Levine 2005). The differences in financing between the country groups may be attributed to the higher accessibility of bank and trade credit in countries with higher economic and financial development levels.

Additionally, Figure 3.5 displays a bar chart presenting the adoption rate and legal mandate of IFRS for SME in each of the country groups. Notably, upper-middle-income countries have a higher adoption rate of IFRS for SME compared to the other income groups. Low-income countries that have adopted the standards have higher requirements for SMEs to report under the framework compared to other country groups. These findings suggest that the adoption and enforcement of IFRS for SME may be influenced by the level of economic and financial development in a country (Gassen 2017).

Thus, to further explore the impact of IFRS for SME adoption, mandate, and experience, Tobit regressions are conducted based on the country income group. This analysis considers the differences in financial and economic development levels within each country group and provides a more nuanced understanding of the impact of IFRS for SME-on-SME financing.
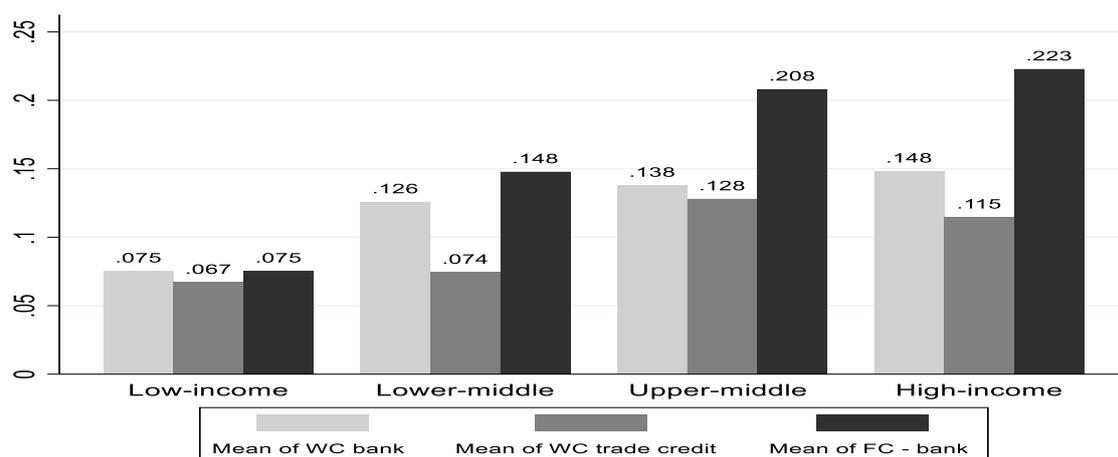
*Figure 3.4: SME financing based on country income group.*
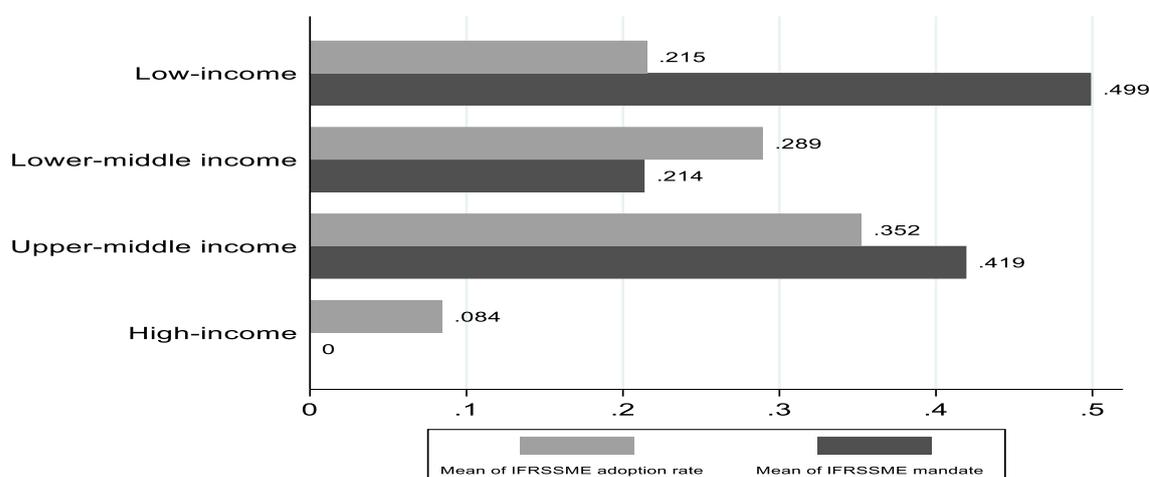
Figure 3.5: IFRS for SME adoption and mandate by country income group

Table 3.15 presents the Tobit marginal estimates for bank-financed working capital and trade credit-financed working capital, organized by country income group. The table is divided into three panels according to the variable of interest: IFRS for SME adoption, legal mandate, and experience. The results suggest that SMEs with external audits in countries that have adopted IFRS for SME have higher access to bank credit across all country income groups except for upper-middle-income countries. This finding is consistent with the argument that external audits can increase the credibility of financial statements, thereby enhancing the creditworthiness of SMEs. In low-income countries that have adopted the standards, SMEs with higher institutional quality have increased access to bank credit. This is in line with previous research indicating that the quality of institutions can facilitate access to finance (Beck et al. 2005).

The results of the three-way interaction effects suggest that audited SMEs in upper-middle-income countries have higher access to trade credit if the country has adopted IFRS for SME. This result suggests that the legal requirement of IFRS for SME combined with external audits can facilitate access to finance through trade credit in upper-middle-income countries. Additionally, in low-income countries that have adopted the standards and have a high institutional quality, SMEs have increased access to trade credit. This finding is consistent with previous research indicating that the quality of institutions can facilitate access to trade credit (Love and Mylenko 2003).

The results from panel B, with the IFRS for SME legal mandate as the variable of interest, did not indicate any statistically significant results. This may be attributed to the fact that the legal mandate for IFRS for SME is not uniformly enforced across countries, which may have influenced the outcome. However, the interaction effects in panel C, where the IFRS for SME experience is the variable of interest, revealed that audited SMEs in lower-middle-income countries with longer experience using IFRS for SME have higher access to bank and trade credit. A similar outcome is found in the interaction between IFRS for SME experience and institutional quality. These findings suggest that SMEs in lower-middle-income countries that have used IFRS for SME for a longer period of time and have external audits have increased access to finance, which can be attributed to the enhanced credibility and transparency of financial statements that can result from the implementation of IFRS for SME.

Overall, the results suggest that the impact of IFRS for SME on access to finance is contingent on the level of institutional quality, experience using the standards, and the use of external audits, and that these factors may vary across different country income groups.

Table 3.15: IFRSSMEs, external audit, and IQ effect on WC finance: Country classification.

The table presents Tobit marginal estimates for the impact of IFRS for SME adoption, mandate, and experience on working capital financed by banks (columns 1-4) and working capital financed by trade credit (columns 5-8) based on country income classification. The countries are grouped into low-income (1 and 5), lower-middle income (2 and 6), upper-middle income (3 and 7), and high-income (4 and 8). The dependent variables are continuous. IFRS-SME adoption is a binary variable representing country adoption of the standards. IFRS-SME mandate indicates the legal requirement of the standards, with 1 indicating mandatory adoption and 0 indicating permitted/allowed adoption. IFRS-SME experience represents the length of use of the standards. IQ is an index representing a country's institutional quality. External audit is a binary variable for SMEs engaging with an external auditor. The firm controls include international standard certification, subsidiary status, ownership concentration, foreign ownership, and manager experience. Size, industry, and year effects are included. Of interest in the results are the interaction effects between IFRS for SME and external audit, IFRS for SME and institutional quality, and the three-way interaction effects of the three variables

Panel A.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
adoption	-0.335***	0.004	0.299***	0.673***	-0.203**	0.661***	0.159***	-0.379*
	(-3.42)	(0.12)	(6.80)	(2.86)	(-2.50)	(18.88)	(3.44)	(-1.77)
External audit	0.289***	-0.026	0.158***	0.466***	0.203***	0.279***	-0.146***	-0.272***
	(6.50)	(-0.89)	(5.34)	(5.28)	(7.35)	(9.03)	(-5.04)	(-2.65)
IFRSSME #Audit	0.420***	0.228***	-0.272***	0.940***	-0.011	-0.329***	0.213***	0.772***

	(3.90)	(5.31)	(-5.46)	(3.73)	(-0.13)	(-7.73)	(4.15)	(3.24)
IQ	1.181***	0.961***	0.038	0.933***	-0.136	1.280***	0.005	-0.706***
	(6.07)	(17.05)	(0.75)	(8.57)	(-1.02)	(20.67)	(0.11)	(-5.55)
IFRSSME # IQ	0.946***	-0.320***	-0.456***	-0.807***	0.894***	-1.577***	-0.268***	0.507*
	(3.23)	(-2.95)	(-5.29)	(-2.64)	(3.75)	(-15.03)	(-3.00)	(1.75)
IQ # Audit	-0.596***	0.283***	-0.151***	-0.567***	-0.774***	-0.685***	0.296***	0.319**
	(-2.96)	(4.30)	(-2.58)	(-5.13)	(-5.63)	(-9.61)	(5.12)	(2.45)
IFRSSME #IQ#Audit	-0.512*	-0.346***	0.518***	-1.193***	0.387	1.098***	-0.322***	-1.033***
	(-1.70)	(-2.84)	(5.42)	(-3.62)	(1.59)	(9.24)	(-3.30)	(-3.20)
N	6210	47,190	38,962	19,539	7,005	46,924	38,983	19,558
Log likelihood	-2472	-26271	-22972	-12314	-2998	-22356	-21616	-11095
Pseudo R^2	0.1683	0.1195	0.0690	0.0430	0.0761	0.0429	0.1215	0.0620

Panel B.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mandate	0.124	0.506***	0.211**	0.000	-0.157*	-0.363***	0.451***	0.000
	(1.14)	(6.12)	(2.19)	(.)	(-1.68)	(-3.96)	(4.53)	(.)
External audit	0.617***	0.161***	-0.133***	1.452***	0.087	-0.103***	0.032	0.286*
	(2.89)	(4.18)	(-2.90)	(6.38)	(0.42)	(-2.94)	(0.70)	(1.67)
IFRSSME #Audit	0.039	-0.244**	0.012	0.000	0.165	-0.037	0.066	0.000
	(0.16)	(-2.09)	(0.11)	(.)	(0.70)	(-0.23)	(0.56)	(.)

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	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IQ	1.999***	1.582***	-0.332***	0.663*	0.463	1.387***	0.354***	0.052
	(3.72)	(9.60)	(-3.34)	(1.67)	(1.01)	(9.25)	(3.44)	(0.21)
IFRSSME # IQ	0.000	-1.589***	-0.297*	0.000	0.000	0.298	-0.884***	0.000
	(.)	(-6.27)	(-1.68)	(.)	(.)	(1.23)	(-4.82)	(.)
IQ # Audit	-0.518	0.064	0.441***	-1.848***	-1.072	0.617***	-0.010	-0.385*
	(-0.50)	(0.46)	(5.18)	(-6.17)	(-1.01)	(4.74)	(-0.12)	(-1.65)
IFRSSME #IQ#Audit	-0.497	0.463	-0.112	0.000	0.527	-0.294	-0.113	0.000
	(-0.46)	(1.50)	(-0.56)	(.)	(0.48)	(-0.79)	(-0.51)	(.)
N	1,331	13,262	14,150	1,830	1,331	13,269	14,187	1,829
Log likelihood	-675	-6428	-8914	-1107	-595	-6928	-7835	-861
Pseudo R^2	0.1556	0.0934	0.0677	0.0751	0.0581	0.0710	0.1607	0.1863

Panel C.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
experience	0.005	-0.080***	0.103***	-0.024	0.020	-0.050***	-0.091***	-0.046**
	(0.44)	(-5.17)	(6.25)	(-0.69)	(1.61)	(-3.61)	(-4.87)	(-1.97)
External audit	0.606***	-0.021	0.008	1.825***	0.241	-0.279***	0.228***	0.227
	(2.79)	(-0.40)	(0.12)	(4.83)	(1.17)	(-5.89)	(3.48)	(0.84)
IFRSSME #Audit	0.009	0.046***	-0.039***	-0.374**	-0.050	0.076***	-0.060***	0.132
	(0.20)	(3.39)	(-2.60)	(-2.00)	(-1.15)	(5.97)	(-3.56)	(0.89)
IQ	2.105***	-0.442	0.567***	0.646	0.072	1.109***	-0.854***	0.133
	(5.93)	(-1.36)	(3.48)	(1.07)	(0.21)	(3.80)	(-5.11)	(0.34)
IFRSSME # IQ	0.000	0.271***	-0.181***	0.000	0.000	-0.048	0.156***	0.000
	(.)	(4.40)	(-5.43)	(.)	(.)	(-0.86)	(4.16)	(.)
IQ # Audit	-0.726	0.958***	0.198*	-2.298***	-0.214	1.211***	-0.338***	-0.325
	(-1.37)	(4.61)	(1.80)	(-4.17)	(-0.40)	(6.61)	(-3.15)	(-0.79)
IFRSSME #IQ#Audit	-0.047	-0.221***	0.066**	0.435**	0.028	-0.231***	0.104***	-0.147
	(-0.51)	(-4.68)	(2.34)	(1.98)	(0.30)	(-5.27)	(3.30)	(-0.84)
N	1,186	13,262	12,775	1,725	1,186	13,269	12,795	1,724
Log likelihood	-607	-6437	-8101	-1041	-527	-6938	-7057	-837
Pseudo R^2	0.1568	0.0921	0.0706	0.0809	0.0748	0.0697	0.1723	0.1779

t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01

Table 3.16 presents the results for the impact of IFRS for SME adoption, mandate, and experience on bank financing of fixed capital for the country income groups. The results show that the interaction effects between IFRS for SME and external audit, and IFRS for SME and institutional quality (IQ) are not statistically significant in all three panels. This lack of significance may be due to the relatively smaller sample size of SMEs that use bank credit for fixed capital. However, the findings suggest that external audits may lead to improved SME financing of working capital in low and lower-middle-income countries.

This result is consistent with previous studies that found external audits to be positively associated with access to finance in emerging markets (Arens et al., 2016; Ayyagari et al., 2011). The positive impact of external audits on bank financing may be due to increased transparency and credibility of financial statements, which can lead to higher investor confidence and lower information asymmetry (Francis et al., 2004). Moreover, SMEs that undergo external audits may be viewed as more professional and reliable borrowers, which can improve their reputation and increase their chances of obtaining bank financing (Cull et al., 2009).

In addition, the lack of significant interaction effects between IFRS for SME and IQ may be due to the relatively low level of institutional quality in some of the countries in the sample, which may have constrained the effectiveness of IFRS for SME. Previous studies have shown that institutional quality is positively associated with access to finance (Beck et al., 2003; Djankov et al., 2007), and that IFRS adoption may be more effective in countries with higher levels of institutional quality (Ball, 2006; Daske et al., 2008). However, in countries with weaker institutional quality, the impact of IFRS adoption may be limited due to challenges in implementation and enforcement (Gassen, 2017).

Overall, the findings highlight the importance of external audits in improving access to bank financing for SMEs, particularly in low and lower-middle-income countries. However, the effectiveness of IFRS for SME may be contingent on the level of institutional quality, which may influence the implementation and enforcement of the standards.

Table 3.16: IFRSSME, external audit, and IQ effect on bank-financed FC: Country classification.

The table reports Tobit marginal estimates based on country classification, low-income, lower-middle income, upper-middle income, and high-income. The dependent variable is continuous: fixed capital financed by banks. IFRS for SME adoption is a dummy variable representing country adoption of the standards. IFRS for SME mandate indicates the legal requirement of the standards–Mandatory (1), permitted/allowed (0), and IFRS for SME experience represents the length of use of the standards. IQ is an index representing a country's institutional quality. External audit is a binary variable for SME engaging with an external auditor. Firm controls are included; these are international standard certification, subsidiary status, ownership concentration, foreign ownership, and manager experience. Size, industry, and year effects are included. The smaller number of SMEs recording the use of bank credit for fixed capital may limit the results.

Panel A.	Fixed capital financed through banks			
	(1)	(2)	(3)	(4)
IFRSSME adoption	0.220	-0.062	0.222**	-0.279
	(1.04)	(-0.70)	(2.05)	(-0.46)
External audit	0.334***	0.229***	0.184***	1.006***
	(3.36)	(3.00)	(2.77)	(5.14)
Table continues next page				
IFRSSME #Audit	0.157	0.137	-0.125	1.204*
	(0.74)	(1.30)	(-1.00)	(1.90)
Institutional quality (IQ)	1.169**	1.589***	0.232*	0.792***
	(2.47)	(10.48)	(1.96)	(3.22)
IFRSSME # IQ	-0.378	-0.550**	-0.349	0.440
	(-0.52)	(-1.98)	(-1.62)	(0.58)
IQ # Audit	-0.571	-0.420**	-0.226*	-1.234***
	(-1.20)	(-2.37)	(-1.65)	(-5.04)
IFRSSME #IQ#Audit	0.049	0.523*	0.351	-1.483*
	(0.07)	(1.71)	(1.42)	(-1.84)
N	2,302	16,278	18,865	12,413
Log likelihood	-976	-10149	-13822	-9572
Pseudo R^2	0.0927	0.0621	0.0551	0.0336
Panel B.	(1)	(2)	(3)	(4)
IFRSSME mandate	0.299	0.594***	0.145	0.000
	(1.59)	(2.98)	(0.57)	(.)
External audit	0.342	0.199**	-0.081	2.219***
	(0.84)	(2.28)	(-0.66)	(3.79)
IFRSSME #Audit	0.075	-0.803***	0.108	0.000
	(0.16)	(-2.73)	(0.40)	(.)
Institutional quality (IQ)	2.033	2.469***	-0.335	0.384
	(1.61)	(6.33)	(-1.31)	(0.35)
IFRSSME # IQ	0.000	-2.164***	0.048	0.000
	(.)	(-3.60)	(0.10)	(.)
IQ # Audit	1.413	0.526	0.512**	-2.772***
	(0.63)	(1.59)	(2.09)	(-3.73)
IFRSSME #IQ#Audit	-1.810	1.318*	-0.443	0.000
	(-0.78)	(1.73)	(-0.87)	(.)
N	562	5,760	6,216	917
Log likelihood	-287	-2995	-4953	-706
Pseudo R^2	0.1157	0.1189	0.0534	0.0437
Panel C.	(1)	(2)	(3)	(4)
IFRSSME experience	-0.013	-0.139***	0.005	-0.052
	(-0.35)	(-3.78)	(0.12)	(-0.73)
External audit	0.390	0.017	0.037	3.322***
	(0.74)	(0.14)	(0.21)	(3.73)
IFRSSME #Audit	0.037	0.043	-0.012	-0.214
	(0.37)	(1.41)	(-0.29)	(-0.46)
Institutional quality (IQ)	1.960**	-1.927**	0.063	1.793
	(2.20)	(-2.44)	(0.15)	(1.30)
IFRSSME # IQ	0.000	0.599***	0.009	0.000
	(.)	(3.88)	(0.10)	(.)
IQ # Audit	-0.054	1.862***	0.204	-4.433***
	(-0.04)	(3.68)	(0.64)	(-3.63)
IFRSSME #IQ#Audit	-0.125	-0.353***	0.023	0.354
	(-0.56)	(-3.09)	(0.28)	(0.65)
N	480	5,760	5,772	865
Log likelihood	-243	-3010	-4627	-669
Pseudo R^2	0.1365	0.1143	0.0545	0.0473

t statistics in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

3.5 Conclusion

In this chapter, I examined the impact of International Financial Reporting Standards for SMEs (IFRS for SMEs) on access to finance for SMEs. Using data from the World Bank Enterprise Survey, I found that the adoption, legal mandate, and experience of IFRS for SMEs, when combined with external audit and institutional quality, have a positive impact on external credit acquisition for small firms compared to their larger counterparts.

The results show that external audits have a significant positive effect on SME financing of working capital for all country income groups, especially in low and lower-middle-income countries. In addition, IFRS for SME adoption and legal mandate have a positive impact on access to bank credit for working capital in some countries, while the impact of IFRS for SME experience is only significant in lower-middle-income countries.

Furthermore, the study finds that the impact of IFRS for SME on access to trade credit is region-specific and contingent on the legal requirements of the standards, institutional quality, and external audit. The findings suggest that higher institutional quality and external audits can increase access to trade credit for SMEs in low and lower-middle-income countries.

The study's findings have several implications for policymakers, auditors, and SMEs. Policymakers should consider implementing and enforcing IFRS for SMEs, along with external audits and higher institutional quality, to improve SME access to finance. Auditors should encourage SMEs to adopt IFRS for SMEs and consider providing external audits to enhance SME creditworthiness. SMEs should consider adopting IFRS for SMEs and obtaining external audits to improve their access to finance.

Despite the study's significant findings, several limitations exist. First, the study's cross-sectional nature limits causal inference, and future research should consider a longitudinal design. Second, the study focused solely on SME financing, and future research should explore the impact of IFRS for SMEs on other aspects of SME performance, such as profitability and growth. Finally, the study's sample is limited to countries that have adopted IFRS for SMEs, limiting its generalizability to non-adopting countries.

Future research should examine the impact of IFRS for SMEs on SME financing using a longitudinal design and expand the analysis to non-adopting countries. In addition, future research should explore the impact of IFRS for SMEs on other aspects of SME performance and the moderating effects of other contextual factors, such as firm age, size, and industry.

Chapter 4

Assessing the Impact of Interest Rate Caps on Small and Medium Enterprises (SMEs) Financing: An Empirical Study

"Interest rate caps can have unintended consequences for the financial system, including reduced credit availability and an increase in informal lending. These caps can also lead to reduced transparency, which can hinder the functioning of financial markets. Policymakers need to carefully consider the potential trade-offs when implementing interest rate caps and explore alternative policy tools that can achieve similar objectives without the negative side effects."

(Barr and Siems 2016)

4.0 Introduction

Access to finance is critical for small and medium-sized enterprises (SMEs) to sustain and grow their businesses. In many developing countries, high-interest rates pose significant barriers to accessing finance, limiting the growth of the SME sector. Policymakers often respond by imposing interest rate caps (IRC) on lending institutions to lower borrowing costs and promote greater credit access. However, the effectiveness of these policies in improving SME financing is subject to debate, with scholars suggesting that they may have unintended consequences, including credit rationing and lower access to finance.

This chapter aims to investigate the impact of IRC on SME finance using cross-sectional and panel firm-level data from the World Bank Enterprise Survey and the interest rate repression dataset (IRRD) from a 2019 survey of countries that use interest rate controls. It incorporates institutional variables such as institutional quality, financial development, and corruption perception as country controls. The study employs ordered Probit, Probit, and Tobit panel regression analysis techniques to examine the relationship between IRC and various measures of SME financing, including credit constraint, finance access, and bank financing. The study also explores the interaction effects of IRC with firm-level and country-level factors, such as external audit, institutional quality, and geographic regions.

The findings of the study suggest that IRC policies increase SME credit constraint, with smaller SMEs being more credit constrained compared to larger ones. The study also identifies a limitation of non-interest fees related to IRC, which alleviates SME credit constraint. The impact of IRC on SME finance is further analyzed based on regional and country heterogeneities, with results showing differences in results based on institutional factors and IRC features.

The results of this study have significant implications for policymakers seeking to promote SME finance, industry practitioners, and SMEs themselves. Policymakers may need to reconsider the use of IRC as a tool for improving SME financing, particularly in low- and middle-income countries. Industry practitioners and SMEs may benefit from understanding the potential impact of IRC on their access to finance and exploring alternative financing options.

The structure of this chapter follows a logical progression of presenting the features of IRC and a review of the IRC literature in Section 4.1, followed by the development of hypotheses based

on this review. Section 4.2 describes the data sources used in this study and defines the variables used to measure the impact of IRC on SME financing. Section 4.3 specifies the empirical methodology employed in the study, and Section 4.4 presents the descriptive, empirical, and robustness results of the study. Finally, Section 4.5 provides the conclusions of the study, highlighting the key findings and implications of the study.

4.1 Literature Review

Interest rate controls (IRCs) have been implemented by governments globally to control exorbitant interest rates and protect vulnerable borrowers (Madeira, 2019). IRCs have historically been utilized to subsidize specific economic sectors, including small and medium-sized enterprises (SMEs), by reducing the cost of borrowing (Roa et al., 2021; Miller, 2013). However, the inability to value risk accurately can exacerbate the adverse selection problem (Miller, 2013), while credit reallocation from the lower end of the market to larger firms is also a possibility, exacerbating the credit constraint for SMEs (Cozarenco and Szafarz, 2020; Madeira, 2019). Despite the widespread use of IRCs, there is limited literature examining their impact on SME financing, particularly with respect to credit demand. Therefore, this study seeks to contribute to the ongoing academic and policy debates on the role of IRC policies in credit markets and address the gap in the literature by examining the impact of IRC policies on SME credit demand and non-interest rate fee limitations.

4.1.1 Interest rate controls use and features.

IRC policies are widely used in both developed and developing countries, with a prevalence in common law nations, including countries in South Asia, the Americas, and Sub-Saharan Africa. According to the survey conducted by Calice et al. (2020), 63 out of 108 countries had IRC policies in place as of 2019. However, the literature on the effects of IRC policies on financing is country-specific and focused mainly on the impact of IRCs on credit supply, rather than credit demand. To contribute to this literature, this chapter analyzes the impact of IRC policies on SME financing in different regional and country settings, addressing the identified gaps in the literature on the impact of IRC policies' non-interest rate fee limitations on SME credit constraints.

Previous literature has categorized IRC policies based on seven features (Ferrari et al. 2018). The first feature is IRC scope, which refers to the credit instrument regulated or the lender that

issues the loan. The second feature is the type of limit imposed, either an absolute or relative limit. The third feature is the limits that apply to IRC, either a single blanket limit or multiple limits based on loan type or borrower attributes. The fourth feature is the methodology applied, signifying the computations used by policy makers. The fifth feature is the benchmark used, which could be a country's central bank rate or average market rate. The sixth feature is whether the rate is binding or non-binding below or above market rates. The seventh feature is the regulation of fees, which could be all-encompassing or have separate limits on non-interest fees and loan commissions.

Different countries have implemented various IRC policies with differing features. For example, Kenya implemented a single cap policy in 2016 but abolished it in 2019, while multiple ceilings IRC policies are used in countries such as South Africa and El-Salvador. The benchmark used by most countries is the average market rate, but a few have experimented with central bank rates, such as Kenya, Nepal, Nigeria, and South Africa. The regulation of fees could be all-encompassing or have separate limits on non-interest fees and loan commissions. The literature on IRC policies, therefore, provides a comprehensive understanding of the various features and characteristics of these policies.

4.1.2 The Debate on Interest Rate Cap Use: Efficacy and Challenges

While some proponents of interest rate caps exist, there is limited evidence supporting the efficacy of IRC policies. South Korea provides an example of where interest rate caps have been successfully implemented. The country's economy experienced exponential growth in the 1960s, fueled by bank credit and state-led bank-based financial systems with capital controls (Crotty and Lee 2002). However, after President Kim Dae Jung embraced a radical neoliberal restructuring, the country's economy declined post the 1997 Asian financial crises. Government control of financial markets cushioned and regulated the chaebols' activities, but liberalization of financial markets at the behest of G7 countries and the IMF allowed conglomerates to access foreign direct investment without government guarantees (Crotty and Lee 2002). Nonetheless, the South Korean model's success is not generalizable across all countries, and strong institutional and regulatory effectiveness is crucial to its effectiveness in spurring the credit market (Demetriades and Luintel 2001). Institutional effectiveness relates to the government's ability to monitor and supervise the credit industry, and civil service strength, enforcement of laws, and supervisory capabilities by government agencies were among the reasons cited for successful credit market control in South Korea.

The debate over the use of Interest Rate Caps (IRC) has been ongoing for many years, with economists on both sides of the argument. For instance, George W. Mitchell, a former vice chair of the United States Federal Reserve, argued against the use of IRC, noting that these policies redirect financial flows, altering borrowing patterns, and reducing credit availability (Mitchell 1967). Similarly, Benmelech and Moskowitz (2010) suggest that IRC policies have been associated with economic and political motivations, similar to usury laws that existed in the 19th century in the US, coinciding with the interests of wealthy political incumbents.

The World Bank and the Consultative Group to Assist the Poor have also cautioned countries against the use of IRC policies, citing potential negative impacts on the credit market (Helms and Reille 2004; Maimbo and Gallegos 2014). However, since the 1990s, there has been a gradual increase in the introduction of IRC policies across countries (Ferrari et al. 2018), including Bangladesh, China, Sri Lanka, Finland, and Vietnam, which introduced interest rate controls on deposits and lending to cushion consumers from economic slumps prompted by the global Covid-19 pandemic (Calice et al. 2020).

Despite their popularity, IRC policies are considered "blunt instruments" and have been associated with several challenges. One of the broad challenges of IRC policies is that they increase information asymmetry across credit markets because of the increase in adverse selection and moral hazard (Miller 2013). Adverse selection occurs when lenders segment clients based on different risk profiles, with borrowers deemed as high risk excluded from the credit market. This results in the 'discouraged' borrowers being charged an aggregate rate, the maximum cap rate (Miller 2013), increasing their ex-ante default probability. Secondly, studies have shown that IRC policies can result in a debt trap. Fekrazad (2020) studied the effect of IRC on payday loans in Rhode Island in the U.S and detailed the debt trap argument. Introducing IRC on payday loans in Rhode Island increased the number of borrowers who opt to rollover their loans, trapping them in a vicious debt cycle. Third, IRC policies can result in mission drift, where microfinance institutions deny credit to its intended borrower segmentation in favour of less risky clients (Mersland and Strøm 2010). For example, loan caps in France have been found to crowd out disadvantaged SME borrowers (Cozarenco and Szafarz 2020), while in Kenya, the introduction of IRC led to the exclusion of riskier clientele from loan portfolios, negatively impacting Tier III banks that target SMEs (Alper et al. 2020). Fourth, the introduction of IRC policies can undermine central bank independence by reducing the signaling effect of monetary policy (Alper et al. 2020). This can increase systemic risk and,

in extreme cases, trigger a collapse of the banking sector. For example, the collapse of credit to SMEs in Kenya was linked to loan shrinkage from lower tier banks when IRC policies were introduced (CBK 2018).

The negative impact of interest rate cap (IRC) policies on the credit market has been well-documented in several countries, including Chile and Bolivia, where the introduction of IRC policies resulted in a reduction in loan sizes and the number of borrowers (Madeira 2019; Roa et al. 2021). In fact, an IMF policy paper identified IRC in Bolivia as a threat to financial inclusion and stability (Heng 2015). These findings highlight the potential negative effects of IRC policies on the credit market and underscore the need for policymakers to implement them with caution, taking into consideration the potential downsides. Several other studies have also examined the impact of interest rate caps on SME finance, with mixed results. For instance, a study on Kenya's interest rate caps by Mungai and Njeru (2018) found that the policy resulted in a decline in the supply of credit to SMEs. Similarly, a study on Uganda's interest rate caps by Kizza and Ssewanyana (2018) found that the policy resulted in reduced credit access for SMEs. On the other hand, a study by Lartey and Antwi (2020) on the impact of interest rate caps on SME lending in Ghana found that the policy had a positive effect on credit availability for SMEs. Additionally, a study of interest rate caps in Peru by Baertl and Pozo (2016) found that the policy led to a decrease in the interest rates charged to SMEs, although the impact on credit availability was less clear.

The mixed results of these studies point to the need for further investigation into the impact of interest rate caps on SME finance. Therefore, the next section of the chapter will present the hypotheses for the study, which will aim to contribute to the existing literature by providing a more in-depth analysis of the impact of interest rate caps on SME lending in the specific context of this study.

4.1.3 Hypotheses

Interest rate caps (IRC) have been widely debated, with some studies criticizing their efficacy (Alper et al. 2020; Calice et al. 2020; Ferrari et al. 2018; Maimbo and Gallegos 2014; Roa et al. 2021; Safavian and Zia 2018). While some researchers have advocated for state-led and bank-based capital controls, these studies are often country-specific, such as the case of South Korea (Crotty and Lee 2002; Demetriades and Luintel 2001). However, previous studies examining the effects of IRC have mainly focused on either the perspective of lenders of capital

or that of borrowers of capital. Therefore, to contribute to this debate, this study formulates the following hypotheses:

H4.1: Interest rate caps increase credit constraints for SMEs.

Small and young SMEs are associated with higher obstacles in accessing credit (Ayyagari et al. 2011; Beck et al. 2009; Kersten et al. 2017). Madeira (2019) found that the introduction of IRC reduced credit demand for smaller economic units in Chile. Particularly, the probability of accessing finance for the young, least educated, and poorer households decreased by 8.7%. Additionally, 9.7% of borrowers were excluded from bank consumer loans, augmenting the "exclusionary" argument against IRC policies. Similarly, Alper et al. (2020), CBK (2018), and Safavian and Zia (2018) noted composition changes in new loans and deposit maturities, coupled with a lower uptake of loans in Kenya. The authors noted a flight of capital from the SME sector to corporate clients and government securities. Therefore, this study evaluates the effect of IRC based on SME size.

H4.2a: Interest rate caps reduce bank-financed working capital for small-sized SMEs compared to medium-sized and large SMEs.

H4.2b: Interest rate caps reduce bank-financed fixed capital for small-sized SMEs compared to medium-sized and large SMEs.

Despite differences in the level of economic development, there has been an increase in the use of IRC policies across countries. Some highly developed countries in Europe have had IRC policies since the 1800s, while other countries have recently tightened their controls, such as Bangladesh, China, Finland, Sri Lanka, and Vietnam (Calice et al. 2020). However, the level of economic development does not necessarily dictate the effectiveness of IRC policies. For example, Heng (2015) found that credit to "targeted" sectors grew with IRC introduction in Bolivia, a lower middle-income country. Conversely, Madeira (2019) found that households' access to credit decreased by an average of 8.7% in Chile, a high-income country. Therefore, I hypothesize that the relationship between IRC and SME credit constraints is positive, regardless of the level of economic development.

H4.3: Interest rate caps increase credit constraints for SMEs regardless of the level of economic development.

The fourth hypothesis in this study suggests that restricting non-interest fees associated with interest rate caps (IRC) decreases credit constraints for SMEs. This hypothesis is based on the observation that non-interest fees associated with IRC policies can have a negative impact on

borrowers, especially those with lower financial literacy, and reduce or negate the effectiveness of the caps. Ferrari et al. (2018) note that the effectiveness of IRC policies is limited due to the heterogeneity in their features, while Maimbo and Gallegos (2014) observe that IRC policies are not very effective due to their embedded features, such as the limitation of non-interest fees. Furthermore, the lack of pricing transparency associated with IRC has been evidenced in various country case studies, and non-interest charges associated with IRC, built into complicated loan covenants, can have a negative impact on borrowers.

Studies have shown that non-interest charges can be a significant burden for borrowers, especially those with limited financial literacy, and can lead to reduced credit access and increased credit constraints (Cohen-Cole et al. 2010; Levitin 2015). A restriction on non-interest fees associated with IRC policies can enhance pricing transparency, reduce hidden fees, and promote effective interest rate caps. Furthermore, a study by Roa et al. (2021) found that restrictions on non-interest fees could reduce credit constraints for SMEs in Bolivia, as these fees can contribute to higher effective interest rates and reduced credit availability for SMEs. Hence, the fourth hypothesis is stated as:

H4.4: Restricting non-interest fees associated with IRC decreases credit constraint for SMEs.

4.2 Data and Variable Definition

4.2.1 Data.

The study uses data from the World Bank Enterprise Survey (WBES) published in March 2022 to examine the effects of interest rate controls (IRC) on SME credit constraints. The WBES provides comprehensive firm-level data on variables that affect SME operations. Previous studies have used the dataset to explore factors that affect SME operations, such as access to finance (Beck et al. 2005; Demirgüç-Kunt and Maksimovic 2002) and the impact of corruption on firm performance (Choi et al. 2018). To identify the prevalence of IRC policy implementation, country-level data are obtained from the 2019 survey on Interest Rate Controls, the Interest Rate Repression Dataset (IRRD) (Calice et al. 2019). In addition, the study utilizes data on IRC prevalence from various World Bank publications (Ferrari et al. 2018; Maimbo and Gallegos 2014), as the WBES covers more countries than the 108 surveyed in the IRRD.

To control for country-level factors that may affect SME credit constraints, the study employs four variables. Firstly, the Index of Financial Development (FD) from the International

Monetary Fund (Svirydzenka 2016), which covers 183 countries annually between 1980 and 2017 and aggregates measures on depth, access, and efficiency in financial institutions and markets. Svirydzenka and Topalova (2017) found that an increase in financial development leads to an increase in access to credit and a decrease in interest rates. Secondly, the Corruption Perception Index (CPI) from Transparency International (Transparency International 2022), which collects data on the perception of public sector corruption from 180 countries annually. The Corruption Perception Index (CPI) has been used in various studies to assess the impact of corruption on firm performance (Gyimah-Brempong et al. 2018; Krambia-Kapardis and Petridou 2020). Thirdly, the Institutional Quality (IQ) variable, constructed from the six indicators that make up the World Governance Indicators (WGI) dataset by the World Bank (Kaufmann et al. 2011), which includes governance dimensions such as voice and accountability, political stability, government effectiveness, control of corruption, rule of law, and regulatory quality. Prior research has found that institutional quality affects access to finance (Hillman and Weiss 1998) and investment decisions (Busse and Hefeker 2007). Lastly, the study incorporates country economic development, grouping countries according to their Gross National Income (GNI) level. GNI is a categorical variable with four ranks, ranging from low-income nations with a GNI per capita below \$1,046 to high-income nations with a GNI per capita above \$12,695 (Hamadeh et al. 2022).

Thus, the study employs a comprehensive dataset to investigate the impact of IRC on SME credit constraints while accounting for the effects of country-level factors.

4.2.2 Variable definition

The variables are presented in the following order: dependent variables, variables of interest, and control variables.

Dependent variables:

The main dependent variable in the study is SME credit constraint, which has been widely used in previous studies (Chavez 2017; Fowowe 2017; Kuntchev et al. 2013). The objective measure of SME credit constraint is assessed based on whether the firm has external sources of finance, has applied for loans or lines of credit, and the reasons for not obtaining external finance. This measure categorizes an SME into one of four categories: "not credit constrained" (NCC), "maybe credit constrained" (MCC), "partially credit constrained" (PCC), and "fully credit constrained" (FCC). The credit constraint measure is based on a set of questions in the WBES

survey, covering various sources of external finance, loan applications and approvals, and reasons for not applying for a loan.

As an alternative measure, a subjective measure of finance access is also used, as in chapter 2. The measure is perception-based and part of the World Bank Enterprise Survey (WBES) questions. Question k30 asks, "How much of an obstacle is access to finance?" It is measured on a Likert scale with responses ranging from 0 to 4, with 0 indicating no obstacle and 4 indicating a very severe obstacle.

In addition to credit constraint, other dependent variables include the amount of working capital and fixed capital that an SME obtains from banks.

For more information on the key variables used in this study, see section 1.5 of this thesis.

Variable of interest:
To distinguish the implementation of interest rate controls (IRC) and the limitation of non-interest fees associated with IRC, the study uses the Interest Rate Repression Dataset (IRRD) published by the World Bank (Calice et al., 2020). The IRRD data comprises 108 country observations provided by 91 central banks and financial supervisory authorities, 20 local banking associations, and 9 World Bank financial sector experts. It includes information such as the year of introduction of the IRC, the IRC type, the financial products regulated, limit on fees associated with the IRC, the methodology used to determine IRC, and the basis for regulation of IRC.

To confirm the veracity of the IRRD data, the study also uses data from academic and World Bank policy papers (Ferrari et al., 2018; Heng, 2015; Madeira, 2019; Maimbo and Gallegos, 2014). Country-level data are screened on a case-by-case basis to limit observations to the usage of IRC policies, not other interest rate controls, and the effective year. The IRC variable is binary and equal to 1 if the WBES was conducted in a country during a period with IRC and 0 if no IRC are in place during the survey.

Additionally, the study uses the limit or lack of limit on non-interest fees associated with the IRC variable obtained from the IRRD. The variable is equal to 1 if there is a limit on non-interest fees; otherwise, it is 0. By including these variables, the study can examine the distinct impacts of interest rate controls and the limitation of non-interest fees on SME credit constraints.

Control variables:

To ensure that the results obtained from the study are not influenced by extraneous factors, several firm-level variables are included as controls. These variables include subsidiary status, female ownership, foreign ownership, ownership concentration, manager experience, external audit-status, and international standard certification (ISC). Size, industry, and year effects are also included, with size classified as small, medium-sized, and large SMEs. The industry variable includes 19 dummies representing the industries as classified in the WBES. Time effects are accounted for using year dummies.

Additionally, four country-level control variables are included in the study: the index of financial development (FD), corruption perception index (CPI), gross national income variable (GNI), and institutional quality (IQ). The financial development index (FDI) is measured on a continuous scale from 0.00 to 1.00 and measures depth, access, and efficiency in both financial institutions and financial markets. The CPI is measured on a continuous scale from 0 to 100 and is used to control for the level of institutionalized corruption in each country, with lower scores indicating higher levels of corruption. The GNI is used to control for economic development, and institutional quality (IQ) is a composite index constructed from the six governance indicators in the World Governance Indicators (WGI) dataset, which measures voice and accountability, political stability, government effectiveness, control of corruption, rule of law, and regulatory quality. The continuous measures are rescaled for comparability and ease of analysis, ranging from 0.00 to 1.00. The country variables are obtained from taking long averages for the survey period from 2006 to 2020.

By controlling for these variables, this study ensures that any observed effects on SME credit constraints are not due to other factors that may affect credit constraints.

4.3 Research Methodology

In this study, the dependent variable, credit constraint, has categorical outcomes, which makes the ordered logit and ordered probit models the most appropriate models for discrete and ordinal variables with more than two outcomes (Borooah 2002). As such, the ordered probit model is used to estimate the coefficients. The choice of this model is due to its advantages, such as modeling data with multiple categories and providing a more accurate estimation of the standard errors compared to the ordered logit model (Cameron and Trivedi 2013). This model has been widely used in previous studies that use the World Bank Enterprise Survey

dataset (Asiedu et al. 2013; Kuntchev et al. 2013). The statistical software package Stata is used for the analysis, and the results are reported as marginal effects to facilitate the interpretation of the coefficients. Furthermore, robustness checks are performed to ensure the consistency and robustness of the findings, including sensitivity analysis of key variables, alternative model specifications, and cluster-robust standard errors.

The baseline model is estimated using Eq. 4.1, which includes several firm-level and country-level controls that are expected to affect SME credit constraint. The dependent variable, credit constraint, is measured on a four-point scale, with values of 0 indicating not being credit constrained, 1 indicating maybe fully credit constrained, 2 indicating partially credit constrained, and 3 indicating fully credit constrained.

The firm-level controls include eight variables: external audit, internationally recognized standard certificates (ISC), female ownership, foreign ownership, ownership concentration, subsidiary status, manager experience, and SME size. External audit and ISC are binary variables that indicate whether the firm has undergone an external audit or has an internationally recognized standard certification. Female ownership, foreign ownership, ownership concentration, and subsidiary status are also binary variables that indicate the ownership structure of the firm. Manager experience is a continuous variable that measures the number of years of experience a manager has in the industry. SME size is controlled using three dummy variables, with small SMEs as the reference category.

The three country-level controls are institutional quality (IQ), perception of country corruption (CPI), and level of financial development (FD). Institutional quality is a composite index that measures the quality of governance in a country, based on six indicators: voice and accountability, political stability, government effectiveness, control of corruption, rule of law, and regulatory quality. CPI measures the perception of corruption in the public sector, and FD measures the depth, access, and efficiency of financial institutions and financial markets in a country.

The firm-level and country-level controls are included in the baseline model to control for other factors that may affect SME credit constraint, such as ownership structure, manager experience, and the quality of governance and financial systems in a country. By including these controls, we can more accurately estimate the effect of the variable of interest (IRC) on SME credit constraint.

Overall, the baseline model is specified as:

Equation 4.1: Baseline model

$$Credit\ constraint_{ij,t} = External\_audit_{i,j,t} + ISC_{i,j,t} + Female\_Ownership_{i,j,t} + Foreign\_Ownership_{i,j,t} +$$
$$Ownership\_Concetntration_{i,j,t} + Subsidiary\_status_{i,j,t} + Mgr\_exp_{i,j,t} + Size_{i,j,t} + IQ_j + CPI_j + FD_j + \acute{\epsilon}_{i,j,t}$$

(Eq. 4.1)

Where the subscripts $_i$, $_j$, and $_t$ represent firm, country, and year, respectively, and $_e$ is the error term.

After establishing the baseline model, the subsequent model includes the variable of interest, interest rate caps/ceilings (IRC). The model is specified in Eq. 4.2 and estimated to examine the impact of IRC on SME credit constraint:

Equation 4.2

$$Credit\ constraint_{ij,t} = IRC_{j,t} + Firm\_controls_{i,j,t} + Country\_controls_{i,j,t}$$ (Eq. 4.2)

he dependent variable, credit constraint, is a categorical variable with four levels, ranging from not credit constrained (NCC) to fully credit constrained (FCC). The variable of interest, IRC, is a binary variable indicating whether an SME is in a country that has implemented an IRC policy at time t. The model includes eight firm-level and three country-level control variables, as indicated in Equation 4.1.

The firm-level controls include binary measures such as external audit and internationally recognized standard certificates (ISC), as well as continuous measures such as the proportion of ownership by foreign owners and the largest owner, and the number of years of experience a manager has in the industry. The size of SMEs is also controlled using three dummies, with small being the reference category. The three country-level controls are institutional quality (IQ), perception of country corruption (CPI), and level of financial development (FD).

To determine the impact of each variable on SME credit access, marginal effects are estimated post-estimation.

To test hypotheses 4.2a and 4.2b, the study uses a continuous variable, bank finance, which measures the level of bank financing for SMEs in a particular income category of countries. The variable is censored at 0, meaning that some SMEs may have no access to bank finance. To analyze this limited dependent variable, a Tobit model is employed, as it is a suitable technique for such data. The Tobit model is a type of regression analysis that estimates the

relationship between a continuous variable and a set of independent variables when the dependent variable is censored or truncated.

Equation 4.3 specifies the model used in this study, which includes the same firm and country controls as the ordered Probit model. The equation includes the intercept ($\beta 0$), the binary variable indicating the implementation of IRC policy ($\beta 1$), and the country-level controls, including the index of financial development (FD), the corruption perception index (CPI), and the institutional quality (IQ). The vector of control variables is represented by $\beta 5$, and the error term is ε.

The Tobit model is an appropriate choice for analyzing bank finance since the dependent variable is censored at 0, and it allows for the estimation of both the probability of observing a zero and the relationship between the independent variables and the non-zero observations. The estimated coefficients in the Tobit model can be interpreted as the marginal effects of the independent variables on the expected value of bank finance for SMEs.

Equation 4.3

$$Bank\ finance\ =\ \beta 0\ +\ \beta 1 IRC\ +\ \beta 2 FD\ +\ \beta 3 CPI\ +\ \beta 4 IQ\ +\ \beta 5 X\ +\ \varepsilon$$

Four separate models are estimated for each of the three income categories: low-income, lower-middle-income, and upper-middle-income countries. The purpose of dividing the countries into income categories is to investigate how the relationship between interest rate controls and SME credit access may vary depending on the level of economic development. The control variables used are the same as in Eq. 4.1, and the Tobit model is used to account for the censored nature of the dependent variable. The Tobit model is appropriate for this analysis as it allows for the inclusion of both censored and uncensored observations in the estimation of the model coefficients. Equation 4. 4 specifies the model used to estimate the relationship between interest rate controls and SME credit access for each income category. Credit constraint indicates the constraint level of an SME based on a four-point scale. 0 indicates not credit constrained (NCC), 1 indicates maybe fully credit constrained (MCC), 2 indicates partially credit constrained (PCC), and 3 indicates fully credit constrained (FCC). IRC is a binary variable indicating whether an SME is in a country that has adopted an IRC policy at time t. The firm and country controls are as indicated in Eq. 4.1. Four separate models are run for each of the

income categories: low-income countries (LIC), lower-middle-income countries (LMIC), upper-middle-income countries (UMIC), and high-income countries (HIC).

Equation 4. 3

$$Credit\ constraint_{ij,,t} = IRC_{,j,t} + Firm\_controls_{i,j,t} + Country\_controls_{i,j,t} \int_{UMIC}^{\begin{array}{l} LIC \\ LMIC \\ HIC \end{array}} \quad (Eq.\ 4.4)$$

To summarize, Equation 4.5 is:

Equation 4. 4

$$Credit\ constraint_{ij,,t} = IRC\ fees_{j,t} + Firm\_controls_{i,j,t} + Country\_controls_{i,j,t} \qquad (Eq.\ 4.5)$$

In this model, the dependent variable is credit constraint, which is measured using a four-point scale ranging from not credit constrained (NCC) to fully credit constrained (FCC). The independent variable of interest is IRC fees, which is a binary variable that indicates whether an SME is in a country that has implemented an IRC policy limiting non-interest charges at time t. The model includes firm-level controls such as external audit, ISC, female ownership, foreign ownership, ownership concentration, subsidiary status, and manager experience, as well as size, industry, and year effects. The three country-level controls are institutional quality (IQ), corruption perception index (CPI), and the index of financial development (FD). After estimation, marginal effects are computed to determine the effect of the variables on SME credit access.

To conduct a robustness check, a subjective measure of finance access is estimated using an ordered Probit model as an alternative to the objective measure of credit constraint. The model used is specified in Eq. 4.6 below:

Equation 4. 5

$$Finance\ access_{ij,,t} = IRC_{,j,t} + Firm\_controls_{i,j,t} + Country\_controls_{i,j,t} \qquad (Eq.\ 4.6)$$

In this model, finance access indicates the obstacles SMEs perceive in accessing finance and is measured on a five-point scale ranging from 0 (no obstacle) to 4 (very severe obstacle). The variable of interest is IRC, which is the same as in Eq. 4.2. The country and firm controls are also used in this model as specified in Eq. 4.1.

4.4 Results and Robustness checks

4.4.1 Descriptive statistics

Table 4.1 provides a summary of the descriptive statistics for the variables used in the study. The average credit constraint level for the sample is 1.93, which suggests that, on average, SMEs face some degree of credit constraint. The average finance access is 1.37, indicating that, on average, SMEs perceive minor obstacles to accessing finance. The mean financing of working capital (WC) and fixed capital (FC) through bank credit is 13.2% and 19.2%, respectively, indicating that bank credit is an important source of financing for SMEs. The average percentage of SMEs from countries that have interest rate caps (IRC) [4] is 71.2%, while an average of 66.9% of the countries surveyed in the interest rate repression dataset (IRRD) have a control on non-interest rate fees[5]. On average, 51.9% of the SMEs surveyed have an external audit of their financial statements, while an average of 24.7% have an internationally recognized standard certificate (ISC). The ownership metrics suggest that, on average, 78.8% of the SMEs are owned by a single entity. Further, an average of 33.6% of the SMEs have female owners, while 7.5% have foreign owners. The mean statistics indicate that 16.8% of the SMEs are subsidiaries of larger firms. On average, the managers of the SMEs surveyed have 18 years of working experience in the industry.

The averages of the corruption perception index (CPI), index of financial development (FD), and institutional quality (IQ) are relatively low, indicating that the business environment may be challenging for SMEs. The CPI, which measures the perception of corruption, has an average of 0.39, suggesting that corruption is perceived to be a significant problem in the countries surveyed. The FD, which measures the level of financial development, has an average of 0.35, indicating that access to finance may be limited in the countries surveyed. The IQ, which measures the quality of institutions, has an average of 0.44, suggesting that the institutional environment may be weak in the countries surveyed.

Overall, these descriptive statistics provide insights into the characteristics of the SMEs and the business environment in the countries surveyed and serve as a useful starting point for the analysis.

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[4] Appendix A.8 presents frequency data of SMEs surveyed from countries with and without IRC.

[5] Appendix A.9 presents frequency data of SMEs surveyed from countries with and without non-interest fees limitations.

Table 4.1: Summary descriptive statistics

Table 4.1 presents summary descriptive statistics, including the number of observations, mean statistics, standard deviation, and range, for the key variables in the study. The dependent variables are credit constraint, finance access obstacle (alternative), working capital (WC) financed by banks, and fixed capital (FC) financed by banks. The variable of interest is country IRC status (binary) and IRC non-interest fees (binary). The firm-level controls include external audit (binary), international standards certification (ISC) (binary), ownership concentration (continuous), female ownership (binary), foreign ownership (binary), subsidiary status (binary), and manager experience (continuous). The country-level controls are continuous variables, including the Corruption Perception Index (CPI), the index of Financial Development (FD), and institutional quality (continuous).

Variable	N	Mean	Std. Dev.	Min	Max
Dependent					
Credit constraint	128022	1.933	1.101	1	4
Finance access obstacle	143273	1.366	1.302	0	4
WC bank-financing	133063	.132	.242	0	1
FC bank-financing	62065	.192	.336	0	1
Variables of interest					
IRC status	148029	.712	.453	0	1
IRC non-interest fees	69584	.669	.47	0	1
Controls					
External audit	145199	.519	.5	0	1
ISC	143629	.247	.432	0	1
Ownership concentration	140640	.788	.266	0	1
Female ownership	141214	.336	.472	0	1
Foreign ownership	145517	.075	.246	0	1
Subsidiary status	145266	.168	.373	0	1
Mgt. experience	143848	18.655	11.444	0	70
CPI	147728	.385	.146	.151	.908
FD	145227	.349	.17	.064	.872
Institutional quality	148029	.439	.225	.012	.996

Table 4.2 presents the Spearman's rank correlation coefficient matrix for the key variables in the study. The first column lists the variables used, and the second column indicates the correlation coefficients with credit constraint. The results show that credit constraint has a positive and significant correlation with the other three dependent variables: finance access, proportion of financing of WC, and FC financed through banks. The other variables have a negative and statistically significant correlation with credit constraint at the 1% level, except for ownership concentration and female ownership. Regarding the firm-level variables, none have statistically significant correlation coefficients that may raise collinearity concerns. However, the country-level controls CPI, FDI, and IQ have a high positive and statistically significant correlation, which could cause collinearity issues. The correlation coefficient between CPI and IQ is particularly high at 0.95. Thus, for empirical analysis, the country-level controls included are CPI and FD, which have a correlation coefficient of 0.59. The IQ variable is used in the robustness tests. It is essential to note that high correlation coefficients do not necessarily indicate a problem of collinearity. Still, they can signal that the variables may not be providing unique information, and further analysis is necessary. Therefore, the study assesses the impact of each variable on the dependent variable while controlling for other relevant variables in the regression models.

Table 4.2: Spearman's rank correlation coefficients

Table 4.2 presents a Spearman's correlation matrix of the sixteen key variables used in the study. The first column lists the variables. The remaining columns present the pairwise correlation coefficients between the variables. The variables included are: (1) Credit constraint, (2) Finance access obstacle, (3) Working Capital (WC) financed through banks, (4) Fixed capital (FC) financed through banks, (5) Country interest rate cap (IRC) status, (6) IRC non-interest fees, (7) External audit, (8) International standard certificate (ISC), (9) Ownership concentration, (10) Female ownership, (11) Foreign ownership, (12) Subsidiary status, (13) Manager experience, (14) Institutional quality (IQ), (15) Corruption perception index (CPI), and (16) Index of financial development (FD). The correlation coefficients range from -1 to +1, where 1 indicates a perfect positive correlation, 0 indicates no correlation, and -1 indicates a perfect negative correlation.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Credit constraint	1.0000								
(2) Finance access	0.3375***	1.0000							
(3) WC bank-financing	0.2022***	0.1305***	1.0000						
(4) FC bank-financing	0.1737***	0.0721***	0.4635***	1.0000					
(5) IRC status	-0.0364***	-0.0948***	-0.0145	-0.0159	1.0000				
(6) IRC non-interest fees	-0.0645***	-0.1362***	-0.0182	0.0266**	0.0309***	1.0000			
(7) External audit	-0.0333***	-0.0909***	0.1038***	0.0805***	-0.0113	-0.0254	1.0000		
(8) ISC	-0.0356***	-0.0964***	0.0861***	0.0561***	0.0796***	0.0796***	0.2598***	1.0000	
(9) Ownership conc.	-0.0166	-0.0259**	-0.0996***	-0.0772***	-0.0109	0.0492***	-0.0891***	-0.0631***	1.0000
(10) Female ownership	-0.0066	-0.001	0.0313***	0.0388***	0.0062	-0.0674***	-0.0123	-0.0039	-0.2316***
(11) Foreign ownership	-0.0767***	-0.0648***	-0.0504***	-0.0541***	-0.0537***	-0.0453***	0.1484***	0.1775***	-0.019
(12) subsidiary status	-0.0511***	-0.0488***	0.0389***	0.0253**	0.0280***	0.0074	0.1823***	0.1720***	-0.0254**
(13) Manager experience	-0.0435***	-0.0358***	0.0351***	0.0530***	0.0114	-0.0511***	0.0526***	0.0490***	-0.0874***
(14) IQ	-0.1361***	-0.1823***	0.0309***	0.0815***	0.1620***	0.3438***	0.1549***	0.1743***	0.0513***
(15) CPI	-0.1407***	-0.1514***	0.0151	0.0903***	0.0738***	0.3181***	0.1568***	0.1554***	0.0471***
(16) FD	-0.1018***	-0.1471***	0.0389***	0.0870***	0.3160***	0.4556***	0.1366***	0.1851***	0.0000

Continued

Variables	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(10) Female ownership	1.000						
(11) Foreign ownership	-0.0621***	1.0000					
(12) subsidiary status	0.0209	0.1799***	1.0000				
(13) Manager experience	0.0761***	-0.0264**	0.0340***	1.0000			
(14) IQ	0.0023	-0.0009	0.1033***	0.1401***	1.0000		
(15) CPI	0.0085	0.0171	0.1077***	0.1734***	0.9537***	1.0000	
(16) FD	0.0105	-0.0470***	0.1185***	0.1141***	0.6609***	0.5886***	1.0000

* p<0.10, ** p<0.05, *** p<0.01

4.4.2 Empirical results.

Table 4.3 presents the baseline results from Eq. 4.1 and the empirical results as specified in Eq. 4.2 with inclusion of the variable of interest, IRC. The variable of interest is SME credit constraint.

As shown in column (1), external audit, foreign ownership, subsidiary status, manager experience, CPI, and FD have negative and statistically significant coefficients at the 1% level. The baseline results support the hypotheses. Consistent with previous literature, external audit reduces SME credit constraints, as it helps in bridging the informational asymmetry gap (Briozzo and Albanese 2020; Hope et al. 2011; Palazuelos et al. 2018). Foreign ownership and the subsidiary status of an SME can also reduce credit constraint, consistent with findings in previous literature (Alquist et al. 2019; Beck et al. 2006). Consistent with previous studies, the level of corruption within a country has an adverse effect on SME credit acquisition (Amin and Motta 2021). Moreover, the level of financial development has a negative effect on SME credit constraint (Kersten et al. 2017).

Column (2) of Table 4.3 presents the main results of the study with inclusion of the variable of interest, interest rate cap (IRC). The main results show that SMEs in countries that have imposed an IRC have a higher credit constraint. The coefficient is positive, statistically significant at the 5% level. This finding is consistent with the theoretical framework that interest rate caps can lead to reduced credit availability due to the higher risk and administrative costs associated with lending to SMEs (Barr and Siems 2016; Cull et al. 2011; Pagés and Micco 2010).

Overall, the results of this study suggest that interest rate caps can have a negative impact on SME credit access. This finding has important policy implications as policymakers need to carefully consider the potential unintended consequences of implementing interest rate caps. Additionally, the study shows that external audit, foreign ownership, and subsidiary status can reduce SME credit constraint, highlighting the importance of firm-level factors in facilitating SME credit access.

Table 4.3: The impact of IRC on SME credit constraint

The table presents the results of the ordered Probit regression models estimated using Eq. 4.1 and Eq. 4.2. The dependent variable is SME credit constraint, which is measured on a four-point scale ranging from not credit constrained (NCC) to fully credit constrained (FCC). The marginal coefficient estimates are presented in columns labelled 1, 2, and 3, which respectively correspond to the baseline model with only firm-level controls, the addition of country-level controls, and the inclusion of the variable of interest, IRC status. The firm-level controls include binary variables for external audit, international standards certification (ISC), female ownership, foreign ownership, subsidiary status, and a continuous variable for ownership concentration. The country-level controls are the corruption perception index (CPI) and the index of financial development (FD). In addition, the models control for size, industry, and year effects.

	Hypothesized sign	(1)	(2)
IRC status	+		0.018**
			(2.08)
Firm Controls			
External audit	-	-0.095***	-0.095***
		(-12.59)	(-12.54)
ISC	-	0.003	0.004
		(0.40)	(0.43)
Ownership conc.	+	0.026*	0.026*
		(1.90)	(1.94)
Female ownership	-	0.006	0.006
		(0.85)	(0.86)
Foreign ownership	-	-0.256***	-0.255***
		(-15.60)	(-15.53)
Subsidiary status	-	-0.067***	-0.067***
		(-7.05)	(-7.05)
Mgt. experience	-	-0.002***	-0.002***
		(-4.98)	(-5.05)
Country Controls			
CPI	-	-0.388***	-0.388***
		(-11.09)	(-11.07)
FD	-	-0.541***	-0.547***
		(-15.46)	(-15.56)
Size effects		Yes	Yes
Industry effect		Yes	Yes
Year effects		Yes	Yes
N		109636	109636
Log likelihood		-132676.85	-132674.78
Pseudo R^2		0.0234	0.0234

t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01

Table 4.4 presents the main and predicted outcomes that give further insights into the impact of IRC on each of the outcomes. The results show that the introduction of IRC policies reduces the probability of SMEs being not credit constrained (NCC) by 0.7% and increases the probability of SMEs being partially credit constrained (PCC), fully credit constrained (FCC), and maybe credit constrained (MCC) by 0.2%, 0.4%, and 0.1%, respectively. These findings confirm the hypothesis that IRC introduction increases SME credit constraint.

These results are consistent with previous studies that have found that interest rate caps can have adverse effects on credit access for SMEs (Beck et al. 2008; Kersten et al. 2017). The introduction of IRC policies can reduce the profitability of lending to SMEs, leading to a reduction in the supply of credit and an increase in the cost of borrowing (Petersen and Rajan 2002). This can make it more difficult for SMEs to obtain financing, particularly those that are riskier or have lower credit scores (Berger and Udell 2006).

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The predicted outcomes in columns (2) through (5) further illustrate the impact of IRC on credit constraint. The predicted probability of SMEs being NCC decreases from 32.5% in the absence of IRC to 31.8% with the introduction of IRC. In contrast, the predicted probability of SMEs being MCC, PCC, and FCC increases from 16.9%, 39.3%, and 11.3% in the absence of IRC to 17%, 39.5%, and 11.4% with the introduction of IRC, respectively. These predicted outcomes demonstrate that the introduction of IRC policies can have a negative impact on SME credit access, increasing the likelihood of credit constraint for many SMEs.

In summary, the results in Table 4.4 provide strong evidence that IRC introduction has a significant adverse effect on SME credit constraint. This finding highlights the importance of carefully considering the potential unintended consequences of interest rate regulation policies on SME credit access.

Table 4.4: The impact of IRC on SME credit constraint - marginal effects

The table presents the coefficients from the regression estimated in Eq. 2 in column (1) and the predicted marginal effects for each of the four outcomes in columns (2) through (5). The dependent variable is SME credit constraint, which is measured on an ordinal scale, with values ranging from 1 (not credit constrained) to 4 (fully credit constrained). The variable of interest is IRC status, a binary variable that takes a value of 1 if a country has adopted an IRC. The firm controls included in the model are external audit, international standard certification (ISC), ownership concentration, female ownership, foreign ownership, subsidiary status, and manager experience. The country controls are the corruption perception index (CPI) and the index of financial development. The model also includes size, industry, and year effects. The results in column (1) show that the introduction of IRC increases SME credit constraint. The predicted marginal effects in columns (2) through (5) indicate that the probability of an SME being NCC decreases by 0.7%, while the probability of an SME being MCC, PCC, or FCC increases by 0.1%, 0.2%, and 0.4%, respectively.

		Predicted outcomes			
	(1)	(2)	(3)	(4)	(5)
	Main model	NCC	MCC	PCC	FCC
IRC status	0.018**	-0.007**	0.001**	0.002**	0.004**
	(2.08)	(-2.08)	(2.08)	(2.08)	(2.08)
Controls	Yes				
Observations	109636	109636	109636	109636	109636
Log likelihood	-132674.78				
Pseudo R^2	0.0234				

t statistics in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Impact of IRC on SME credit constraint based on SME size.

The impact of interest rate caps (IRC) on SME credit constraint is not uniform across different SME sizes. As shown in Figure 4.1, smaller SMEs have lower average financing of working capital (WC) and fixed capital (FC) through bank credit compared to medium and large-sized SMEs. This size effect influencing SME credit is consistent with previous studies (Beck and Demirguc-Kunt 2006; Beck, Demirgüç-Kunt et al. 2008; Kersten et al. 2017) and may result from lower collateral levels leading to higher perceptions of risk (Hanedar et al. 2014). The introduction of IRC policies can exacerbate the credit constraints of SMEs by reducing their access to bank credit. This is because, as cited in previous literature, IRC policies can result in mission drift, where microfinance institutions reallocate their loan portfolios to investments perceived as lower risk, such as corporate and government debt (Alper et al. 2020; Cozarenco

and Szafarz 2020; Roa et al. 2021; Safavian and Zia 2018) and reduce their lending to SMEs. Therefore, the impact of IRC policies on SME credit constraint may be more pronounced in smaller SMEs due to their limited access to collateral and higher perceived risk.
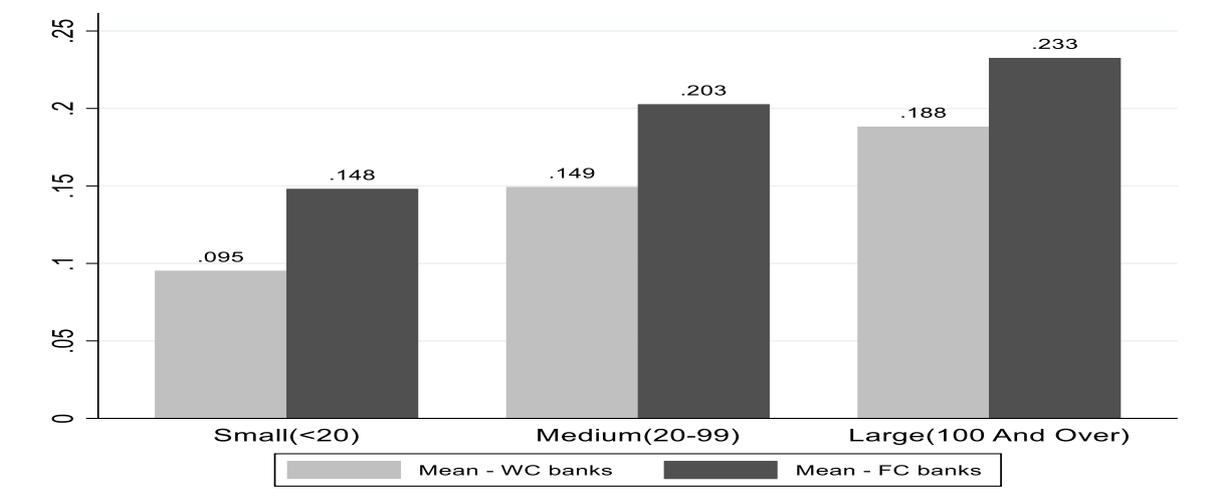

Figure 4.1: Financing of working and fixed capital through banks by SME size

The WBES survey data indicate that SMEs that do not apply for loans cite reasons such as sufficient internal capital, high interest rates, complex application procedures, and high collateral requirements (K7 question). To test the second hypothesis on the exclusionary nature of IRC, a Tobit regression analysis is performed for small, medium-sized, and large SMEs. Table 4.5 presents the results of the impact of IRC on the proportionate financing of working capital (WC) and fixed capital (FC) through bank credit.

The results show that small-sized SMEs reduce WC financed by banks, and the impact is statistically significant at the 10% level. The impact of IRC on bank financing of medium-size and large SMEs is not statistically significant. However, the impact of IRC on FC financed through banks is negative and statistically significant for all three SME sizes. The marginal effect is higher for small SMEs, significant at the 1% level. Medium-sized SMEs and large SMEs have coefficients of -3.9% and -4.6%, respectively, both significant at the 5% level. Therefore, hypotheses 2a and 2b are confirmed.

These findings are in line with previous studies that have found that smaller SMEs face higher credit constraints, likely due to insufficient collateral (Ayyagari et al. 2011). Furthermore, smaller SMEs may find it difficult to negotiate loan terms based on low collateral. Additionally, the reallocation of funds from smaller to larger units, known as mission drift, may also exacerbate credit constraints for smaller SMEs (Alper et al. 2020; Cozarenco and Szafarz 2020; Madeira 2019).

Table 4 5: The impact of IRC on bank credit – based on SME size.

The table reports Tobit marginal estimates as specified in EQ. 4.3. The dependent variables are continuous and include working capital (WC) and fixed capital (FC) financed by banks. The variable of interest is IRC status, which is a dummy variable indicating whether a country has an interest rate cap. Firm controls included are external audit, international standard certification (ISC), ownership concentration, female ownership, foreign ownership, subsidiary status, and manager experience. The country controls included are corruption perception index (CPI) and the index of financial development (FD). Industry and year effects are included as well. The table is presented in three columns, the first column shows the coefficients, the second column shows the marginal effects for small-sized SMEs, and the third column shows the marginal effects for medium-sized and large SMEs. The coefficients in columns (1) and (2) indicate that IRC has a negative and significant effect on WC financed through banks for small-sized SMEs. For medium-sized and large SMEs, the effect of IRC on WC financed through banks is not statistically significant. Columns (4) and (5) show that the effect of IRC on FC financed through banks is negative and significant for all SME sizes. Small-sized SMEs have a higher marginal effect of -6.1% compared to medium-sized SMEs (-3.9%) and large SMEs (-4.6%).

	Small	Medium	Large	Small	Medium	Large
	Dependent variable: Bank financed working capital			*Dependent variable: Bank financed fixed capital*		
Variables	(1)	(2)	(3)	(4)	(5)	(6)
IRC status	-0.016*	-0.002	-0.011	-0.061***	-0.039**	-0.046***
	(-1.85)	(-0.28)	(-1.19)	(-2.90)	(-2.25)	(-2.63)
Firm controls						
External audit	0.130***	0.088***	0.083***	0.180***	0.093***	0.096***
	(17.29)	(13.11)	(9.30)	(9.50)	(6.03)	(4.98)
ISC	0.069***	0.050***	0.052***	0.005	0.026	0.031*
	(6.29)	(6.87)	(6.74)	(0.17)	(1.59)	(1.96)
Ownership conc.	-0.045***	-0.064***	-0.085***	0.012	-0.092***	-0.118***
	(-3.09)	(-5.40)	(-6.40)	(0.33)	(-3.41)	(-4.41)
Female ownership	0.045***	0.034***	0.038***	0.064***	-0.003	-0.004
	(5.86)	(4.96)	(4.89)	(3.41)	(-0.17)	(-0.28)
Foreign ownership	-0.183***	-0.213***	-0.182***	-0.225***	-0.342***	-0.355***
	(-7.77)	(-13.58)	(-14.58)	(-4.16)	(-10.05)	(-14.74)
Subsidiary status	0.018	0.000	0.004	-0.032	-0.039**	-0.006
	(1.59)	(0.03)	(0.54)	(-1.11)	(-2.00)	(-0.34)
Mgt. experience	0.000	0.000	0.001***	-0.003***	-0.000	0.000
	(0.10)	(0.25)	(3.30)	(-3.16)	(-0.06)	(0.04)
Country controls						
CPI	0.368***	0.357***	0.375***	0.325***	0.310***	0.279***
	(11.17)	(11.65)	(9.55)	(3.89)	(4.57)	(3.81)
FD	0.415***	0.112***	-0.191***	0.854***	0.425***	0.149**
	(12.75)	(3.58)	(-5.06)	(9.90)	(5.87)	(1.98)
Constant	-0.667***	-0.180***	-0.008	-1.031***	-0.314***	0.013
	(-17.48)	(-6.23)	(-0.24)	(-10.04)	(-4.73)	(0.21)
Industry effects	yes	yes	Yes	yes	yes	yes
Year effects	yes	yes	yes	yes	yes	yes
Observations	52149	38245	21038	18,498	19,372	13,699
Log likelihood	-27765	-24257	-13568	-11770	-14459	-10758
Pseudo R^2	0.0517	0.0455	0.0611	0.0414	0.0301	0.0382

t statistics in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Impact of Interest Rate Caps on SME Credit Constraint: Analysis by Country Income Classification

The SMEs in the sample are grouped into four categories, representing their respective country income categories. The four categories are low-income countries (LIC), lower-middle-income countries (LMIC), upper-middle-income countries (UMIC), and high-income countries (HIC). Figure 4.2 shows that the lower the country classification, the higher the SMEs credit constraint. Countries grouped as LIC and HIC have a higher average of interest rate cap (IRC).
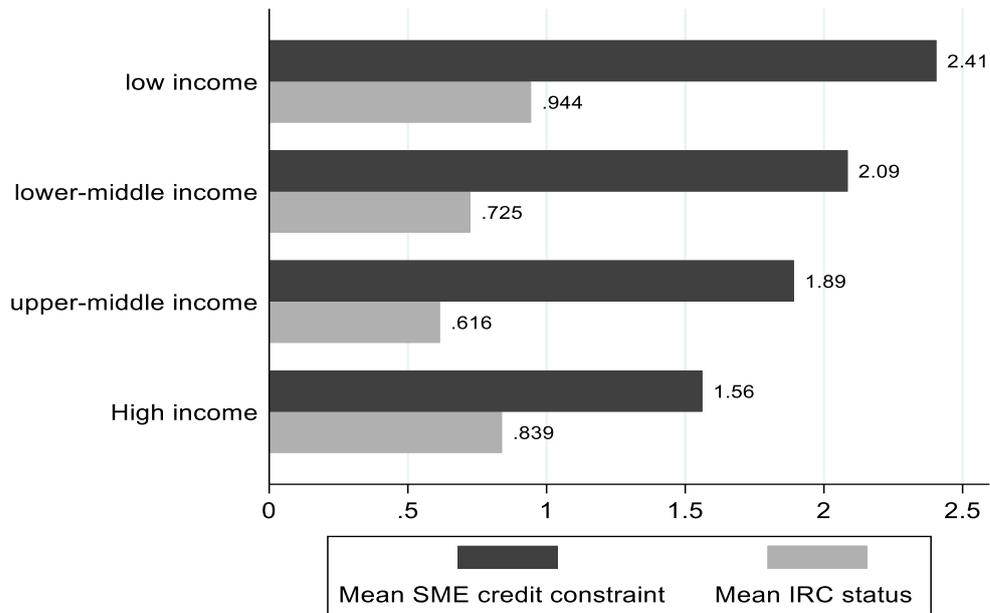
Figure 4.2: SME credit constraint and IRC status by country income group

Therefore, to test hypotheses 4.3, which states that irrespective of the level of the country's economic development, the IRC-SME credit constraint relationship is negative, an ordered Probit regression is conducted.

The results indicate that the IRC-SME credit constraint relationship is positive and significant for SMEs in UMIC and HIC, whereas it is negative and significant for SMEs in LMIC and insignificant for LIC. Therefore, hypotheses 4.3 are confirmed for SMEs in UMIC and HIC and rejected for SMEs in LMIC. These findings are consistent with previous studies that suggest the effectiveness of interest rate caps is context-specific and is influenced by several factors such as policy features and implementation frameworks (Ferrari et al. 2018; Mersland et al. 2020).

The observed differences could also be attributed to the heterogeneity in institutional quality and different levels of economic and financial development. For instance, corruption has been found to adversely impact SME credit constraint (Amin and Motta 2021). Additionally, underdeveloped financial architecture can limit access to credit, especially for SMEs (Kersten et al. 2017). Finally, macroeconomic instability, especially in developing nations, can exacerbate credit constraints for SMEs (Beck et al. 2008). These factors may have a more significant impact on SME credit constraints in LMIC and LIC compared to UMIC and HIC.

In conclusion, the findings suggest that the effectiveness of interest rate caps in reducing SME credit constraints is context-specific and influenced by various factors such as country income classification, policy features, and implementation frameworks.

Table 4.6 presents the regression results as specified in EQ. 4.4.

Table 4.6: The impact of IRC on SME credit constraints - based on country income groups.

The table presents ordered Probit marginal estimates as specified in EQ. 4.4. The dependent variable is SME credit constraint, measured on a Likert scale with four categories: not credit constrained (NCC), maybe credit constrained (MCC), partially credit constrained (PCC), and fully credit constrained (FCC). The table examines the impact of interest rate caps (IRC) on SME credit constraint in four country groupings: low-income countries (LIC), lower-middle-income countries (LMIC), upper-middle-income countries (UMIC), and high-income countries (HIC). The model includes firm controls, such as external audit, international standard certification (ISC), ownership concentration, female ownership, foreign ownership, subsidiary status, and manager experience, and country controls, including corruption perception index (CPI) and the index of financial development (FD). Industry and year effects are also included.).

	(1)	(2)	(3)	(4)
	LIC	LMIC	UMIC	HIC
IRC status	0.233	-0.140***	0.059***	0.103***
	(1.09)	(-9.38)	(4.45)	(3.75)
Firm Controls				
External audit	-0.128**	-0.164***	-0.055***	-0.014
	(-2.54)	(-13.38)	(-4.48)	(-0.71)
ISC	-0.255***	-0.010	-0.002	0.079***
	(-3.09)	(-0.67)	(-0.16)	(3.97)
Ownership conc.	-0.049	0.042*	0.008	-0.036
	(-0.46)	(1.88)	(0.36)	(-1.10)
Female ownership	-0.029	-0.034***	0.027**	0.012
	(-0.52)	(-2.84)	(2.24)	(0.69)
Foreign ownership	-0.109	-0.255***	-0.222***	-0.382***
	(-1.20)	(-9.38)	(-8.42)	(-10.00)
Subsidiary status	0.055	-0.098***	-0.104***	-0.025
	(0.83)	(-6.72)	(-6.34)	(-1.12)
Mgt. experience	-0.004*	-0.002***	0.001**	-0.002***
	(-1.76)	(-3.97)	(1.98)	(-2.94)
Country Controls				
CPI	-8.269***	2.419***	-0.362***	-1.185***
	(-4.05)	(21.75)	(-3.70)	(-7.15)
FD	10.106***	-1.007***	-0.210***	0.252***
	(2.89)	(-12.98)	(-3.07)	(2.71)
Size effects	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
N	2838	46,671	40,134	19,993
Log likelihood	-3342.7132	-57519.301	-48774.251	-19150.802
Pseudo R^2	0.0614	0.0245	0.0115	0.0319

t statistics in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Impact of Limitation of Non-Interest Fees on SME Credit Constraint

The lack of a limitation on non-interest fees is one reason provided for the ineffectiveness of interest rate control policies (Ferrari et al. 2018; Maimbo and Gallegos 2014). The 2019 IRRD indicates that very few countries have a limit on non-interest charges by banks. After merging the country data with the WBES, a subset of twenty-seven countries state they have a limit, while twenty-four countries state they do not have a limit. For the rest of the countries in the sample, it is unclear whether such a limitation exists. Therefore, an ordered Probit analysis is employed to test the effect of limiting non-interest fees.

Table 4.7 provides the main results in the column labelled (1) and predicted outcomes in subsequent columns (2-5). The results support the hypothesis that a limit on non-interest fees has a negative effect on credit constraint. The coefficient is -0.2, significant at the 10% level. Because of the limitation in non-interest rate fees, SMEs are 0.9% more likely to be in the not credit constrained (NCC) category. Further, the limitation on non-interest rate fees reduces the probabilities of SMEs being in the MCC, PCC, and FCC categories by -0.1%, -0.3%, and -0.5%.

The finding is consistent with prior literature, which suggests that banks restructure their loan covenants, thus reducing the effectiveness of the policies in the event of a lack of limitation (Ferrari et al. 2018; Helms and Reille 2004). These increments may be bundled as a product built into a loan covenant, such as expensive credit insurance. The reduced transparency regarding such fees creates a moral hazard and affects borrowers with limited financial literacy. Therefore, the limitations on non-interest fees could lead to a reduction in the credit constraint faced by SMEs.

Table 4.7: The impact of non-interest fees limitation on credit constraint - marginal effects

The table reports the results of an ordered Probit regression, estimated using EQ 4.5. The dependent variable is credit constraint, which is measured on an ordinal scale with four categories: not credit constrained (NCC), maybe credit constrained (MCC), partially credit constrained (PCC), and fully credit constrained (FCC). The independent variable is IRC non-interest fee limitation, a dummy variable that takes a value of 1 if a country has a limit on non-interest charges by banks. The table displays the coefficients from the regression estimated in column (1) and the marginal effects in subsequent columns (2-5).
The regression includes firm-level controls such as external audit, international standard certification (ISC), ownership concentration, female ownership, foreign ownership, subsidiary status, and manager experience, as well as country-level controls including corruption perception index (CPI) and the index of financial development. Additionally, the regression accounts for size, industry, and year effects.

		Predicted outcomes			
	(1)	(2)	(3)	(4)	(5)
	Main model	NCC	MCC	PCC	FCC
IRC fee limitation	-0.023*	0.009*	-0.001*	-0.003*	-0.005*
	(-1.74)	(1.74)	(-1.74)	(-1.74)	(-1.74)
Firm Controls					
External audit	-0.045***	0.018***	-0.003***	-0.006***	-0.009***
	(-4.04)	(4.04)	(-4.04)	(-4.04)	(-4.04)
ISC	0.022*	-0.009*	0.001*	0.003*	0.004*
	(1.76)	(-1.76)	(1.76)	(1.76)	(1.76)
Ownership conc.	0.026	-0.010	0.002	0.003	0.005
	(1.36)	(-1.36)	(1.36)	(1.36)	(1.36)
Female ownership	-0.019*	0.008*	-0.001*	-0.003*	-0.004*
	(-1.78)	(1.78)	(-1.78)	(-1.78)	(-1.78)
Foreign ownership	-0.307***	0.122***	-0.018***	-0.041***	-0.063***
	(-12.53)	(12.53)	(-11.92)	(-12.38)	(-12.55)
Subsidiary status	-0.044***	0.017***	-0.003***	-0.006***	-0.009***
	(-3.30)	(3.30)	(-3.29)	(-3.30)	(-3.30)
Mgt. experience	-0.001***	0.000***	-0.000***	-0.000***	-0.000***
	(-2.72)	(2.72)	(-2.72)	(-2.72)	(-2.72)
Country Controls					
CPI	-0.590***	0.234***	-0.034***	-0.079***	-0.122***
	(-12.69)	(12.69)	(-12.43)	(-12.55)	(-12.60)
FD	-0.372***	0.148***	-0.021***	-0.050***	-0.077***
	(-7.74)	(7.74)	(-7.64)	(-7.74)	(-7.72)
Size effect	yes	yes	yes	yes	yes
Industry effect	yes	yes	yes	yes	yes
Year effects	yes	yes	yes	yes	yes
Observations	53,271	53271	53271	53271	53271
Log likelihood	-65383.511				
Pseudo R^2	0.0268				

t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01

4.4.3 Additional Analysis and Robustness: Impact of IRC on access to finance - alternative measure

An alternative to the objective credit constraint measure used in this study is the access to finance measure, which is a subjective measure based on the respondent's perception of the ease of access to finance. Table 4.3 shows that the correlation coefficient between the two measures is positive and statistically significant at the 1% level, indicating that the two measures are highly related.

To further validate the findings, the impact of IRC on access to finance is re-examined using the alternative measure in Equation 4.6, and the results are presented in Table 4.8. The findings are consistent with the main analysis, showing that introducing IRC reduces the access to finance for SMEs. The IRC-finance access obstacle relationship is positive and significant, confirming the negative impact of IRC on SMEs' ability to access finance.

These findings are in line with prior studies that have shown the negative effects of interest rate caps on the availability and access to credit for SMEs (Beck, Demirgüç-Kunt et al. 2008; Claessens et al. 2008; Mersland and Strøm 2009). Moreover, this alternative measure of access to finance confirms the robustness of the main findings and highlights the consistent impact of IRC on SME credit constraint.

Table 4.8: The impact of IRC on SME finance access - marginal effects

Table 4.8 presents the coefficients and marginal effects from the regression estimated in EQ. 6, where the dependent variable is the SME finance obstacle. The ranked ordinal variable is measured on a Likert scale, where 1 indicates no obstacle in accessing credit, and 5 indicates a very severe obstacle. The independent variable of interest is IRC status, which is a dummy variable equal to 1 if a country has adopted an IRC. The firm controls included are external audit, international standard certification (ISC), ownership concentration, female ownership, foreign ownership, subsidiary status, and manager experience. The country controls include the corruption perception index (CPI) and the index of financial development. In addition, size, industry, and year effects are included. The table reports the coefficients in column (1) and the marginal effects for each of the five outcomes in columns (2) through (6). The results show that introducing an IRC increases the perceived finance obstacle for SMEs, as indicated by the positive and significant marginal effects across all levels of obstacle severity. These findings are robust to the use of an alternative subjective measure of access to finance, suggesting that the impact of IRC on SME finance access is a significant and persistent phenomenon.

		Predicted outcomes				
	(1)	(2)	(3)	(4)	(5)	(6)
	Main model	No obstacle	Minor obstacle	Moderate obstacle	Major obstacle	Very severe obstacle
IRC status	0.053***	-0.020***	-0.001***	0.006***	0.008***	0.007***
	(6.66)	(-6.66)	(-6.39)	(6.65)	(6.66)	(6.65)
Controls	Yes	yes	yes	yes	yes	yes
Industry effect	yes	yes	yes	yes	yes	yes
Year effects	yes	yes	yes	yes	yes	yes
Observations	119,037					
Log likelihood	-173657.77					
Pseudo R^2	0.0192					

t statistics in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Impact of IRC on Access to Finance across Different Country Income Groups.

To further understand the impact of IRC on access to credit across different country income groups, an ordered Probit model is used as specified in EQ. 4.4. Table 4.9 presents the results. The IRC-access to finance relationship, however, is different from the main results for SMEs in LIC and HIC. Whereas the results in the main model, Table 4.6, show that the IRC-credit constraint relationship is negative only for SMEs in LMIC, the IRC-finance access obstacle relationship is negative for SMEs in LIC, LMIC, and HIC. This finding supports the notion that interest rate caps may discourage banks from lending to riskier borrowers in countries with lower levels of economic development, as suggested by prior research (Cull et al. 2015; Beck et al. 2008). Additionally, the negative effect of IRC on finance access for SMEs in HICs contradicts findings from previous studies that suggest that interest rate caps may have a limited impact in highly developed countries due to the existence of well-functioning financial markets and institutional arrangements (Berger and Bouwman 2013; Klapper et al. 2015). However, these findings may be explained by the specific design and implementation of interest rate caps in each country, which can vary widely in terms of their scope, objectives, and effectiveness.

Table 4.9: Impact of IRC on Access to Finance across Different Country Income Groups

The table presents the coefficients from the ordered Probit regression estimated in EQ. 4.4 in column (1). Subsequent columns (2), (3), (4), and (5) present the marginal effects for each of the five outcomes. The dependent variable is finance access, a subjective measure of the ease of access to credit for SMEs. The measure is ranked on a Likert scale with values ranging from 1 for SMEs that cite no obstacle in accessing credit to 5 for SMEs that face very severe obstacles in accessing credit. The variable of interest is IRC, a dummy variable indicating whether a country has an interest rate cap. The firm controls included are external audit, international standard certification (ISC), ownership concentration, female ownership, foreign ownership, subsidiary status, and manager experience. The country controls include corruption perception index (CPI) and the index of financial development (FD). In addition, size, industry, and year effects are included. The table also presents results based on four country income groups: low-income countries (LIC), lower-middle-income countries (LMIC), upper-middle-income countries (UMIC), and high-income countries (HIC).

	Access to finance as an obstacle to SME (alternative)			
	(5)	(6)	(7)	(8)
	LIC	LMIC	UMIC	HIC
IRC status	-0.588***	-0.137***	0.099***	-0.136***
	(-3.59)	(-9.22)	(7.99)	(-5.62)
Firm Controls	Yes	Yes	Yes	Yes
Size effects	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
N	3,403	49,186	44,622	21,826
Log likelihood	-5233.5036	-72741.643	-65075.588	-27788.736
Pseudo R^2	0.0406	0.0247	0.0241	0.0338

t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01

Impact of IRC on Access to Credit and Finance Across Different Geographic Regions.

Small and medium-sized enterprises (SMEs) in the least developed economies, such as those in Sub-Saharan Africa (AFR), face higher obstacles to accessing finance due to under-developed financial markets (Asiedu et al. 2013; Ayyagari et al. 2011; Beck et al. 2005; Beck et al. 2009; Kersten et al. 2017; Quartey et al. 2017). In addition, country case studies in Bolivia

(Heng 2015; Roa et al. 2021) and Chile (Madeira 2019) find that interest rate caps have a negative impact in two countries in Latin America and the Caribbean (LAC).

Figure 4.3 below shows that SMEs in AFR, the South Asia Region (SAR), and East Asia and the Pacific (EAP) have the highest credit constraint. The subjective measure of access to finance obstacles, however, shows that SMEs in AFR, LAC, and the Middle East and North Africa (MNA) cite higher obstacles to accessing finance. The highest averages of IRC usage are in countries in SAR, MNA, and AFR. In addition, countries in SAR, Europe, and Central Asia (ECA), and MNA limit non-interest charges.

To further investigate the relationship between IRC and credit constraint or finance access across different regions, I conduct an analysis based on six regions. Table 4.10 provides the regression results from the IRC-credit constraint analysis. From the results, there is a positive and significant effect of IRC on credit constraint for SMEs in AFR, LAC, and SAR. The IRC-credit constraint relationship is negative for SMEs in EAP and ECA. These findings may be explained by differences in financial development in the respective nations (Asiedu et al. 2013).

To explore the IRC-finance access obstacle relationship, I use the alternative measure for all but one region, MNA, as shown in panel B of Table 4.10. The results are generally robust to the use of the alternative measure, with the IRC-finance access obstacle relationship being negative and significant for SMEs in AFR, EAP, and SAR. However, for SMEs in MNA, the IRC-finance access relationship is negative and significant, while the IRC-credit constraint relationship is insignificant. These differences could be attributed to variations in the dependent variable used, as well as other factors such as differences in the implementation of interest rate caps and non-interest fees across regions (Heng 2015; Madeira 2019; Roa et al. 2021).
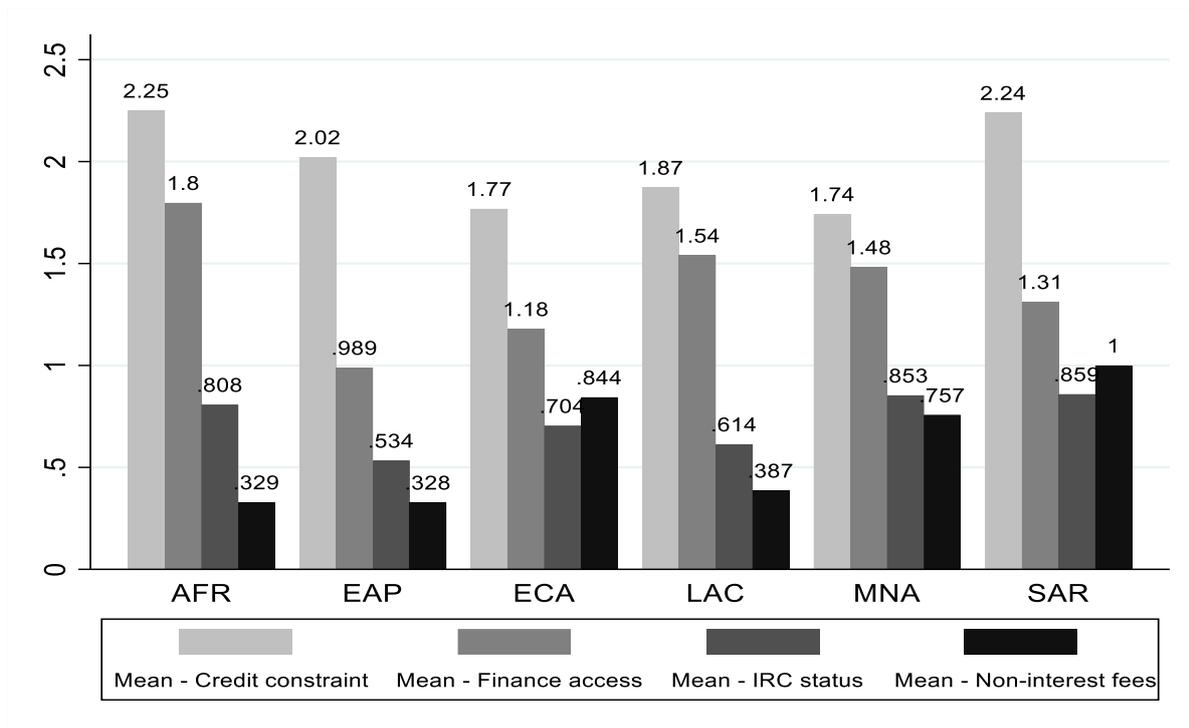
Figure 4.3: SME credit constraint and IRC country status by region

Table 4.10: Impact of IRC on Access to Credit and Finance Across Different Geographic Regions

The table presents ordered Probit marginal estimates based on regions, with panel A reporting results for the dependent variable credit constraint and panel B reporting results for the dependent variable access to finance. The independent variable of interest is IRC status, a dummy variable indicating whether a country has an interest rate cap. The table includes firm controls, such as external audit, international standard certification (ISC), ownership concentration, female ownership, foreign ownership, subsidiary status, and manager experience. Country controls, including the corruption perception index (CPI) and the index of financial development (FD), are also included. Size, industry, and year effects are included in the model. The table presents results for six regions: sub-Saharan Africa (AFR), East Asia and the Pacific (EAP), Europe and Central Asia (ECA), Latin America and the Caribbean (LAC), Middle East and North Africa (MNA), and South Asia Region (SAR).

	(1) AFR	(2) EAP	(3) ECA	(4) LAC	(5) MNA	(6) SAR
Panel A: Credit constraint						
IRC status	0.318***	-0.129***	-0.056***	0.098***	0.029	2.065***
	(11.37)	(-4.55)	(-3.66)	(6.01)	(0.59)	(5.94)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Size effect	yes	yes	yes	yes	yes	yes
Industry effect	yes	yes	yes	yes	yes	yes
Year effects	yes	yes	yes	yes	yes	yes
Observations	15637	11,345	38,005	23,913	9,226	11,510
Log likelihood	-18561.62	-14041.369	-41754.576	-28569.207	-9087.0174	-14284.986
Pseudo R^2	0.0626	0.0242	0.0319	0.0059	0.0260	0.0106
Panel B: Access to finance						
	(1) AFR	(2) EAP	(3) ECA	(4) LAC	(5) MNA	(6) SAR
IRC status	0.193***	-0.148***	-0.098***	0.070***	-0.479***	2.065***
	(6.16)	(-5.03)	(-7.26)	(4.78)	(-10.91)	(7.42)
Controls	yes	yes	yes	yes	yes	yes
Size effect	yes	yes	yes	yes	yes	yes
Industry effect	yes	yes	yes	yes	yes	yes
Year effects	yes	yes	yes	yes	yes	yes
Observations	15,745	12,381	42,047	26,528	9,937	12,399
Log likelihood	-23683.707	-15989.641	-57663.713	-39976.491	-14704.84	-17695.03
Pseudo R^2	0.0510	0.0202	0.0240	0.0132	0.0234	0.0207

t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01

Impact of Interaction Effects between IRC, External Audit, and IQ on SME Credit Constraint.

Various factors can impact SME credit acquisition at the firm-level and country-level. At the firm-level, external audit of a firm's financial statements may influence the credit relationship with lenders (Briozzo and Albanese 2020; Dedman and Kausar 2012; Palazuelos et al. 2018). Ownership structure and institutional quality influence the demand for audits by firms (Baylis et al. 2017; Dedman et al. 2014). Firms with a high concentration of ownership are more inclined to have a private credit relationship with relationship lenders, thus avoiding publishing of financial statements (López-Espinosa et al. 2017). However, transactional lending relationships are based on quantitative, as opposed to qualitative, metrics, so SMEs may need to publish their financials and have an external audit to improve the transactional lending relationship (Facundo and Schmukler 2017; Palazuelos et al. 2018).

SMEs in countries with a lower institutional quality (IQ), as measured by corruption levels, economic and financial development, may have higher credit constraints (Amin and Motta 2021; Kersten et al. 2017; Le and Doan 2020; Martins et al. 2020; Ullah 2020). Therefore, to test the effect of IRC on credit constraint and access to finance, I analyze the interaction effect of IRC with firm-level and country-level factors. The firm-level variable used is external audit, while the country-level variable used is IQ. The IQ variable replaces the index of financial development and corruption perception index (CPI) used in previous models.

Table 4.11 presents the regression results estimated using an ordered Probit analysis technique. Columns 1 and 2 present the main and interaction results for the IRC-credit constraint relationship, while columns 3 and 4 present the coefficients in the IRC-finance access relationship.

The interaction effects between IRC and external audit are positive and significant for both credit constraint and finance access obstacles. This means that the relationship does not alleviate credit constraint for SMEs.

Second, the IRC and IQ interaction is not significant for credit constraint. However, for finance access, there is a negative and statistically significant impact. This may mean that SMEs in countries that have introduced IRC and have high institutional quality have a higher probability of reducing credit constraint. This is evident in countries such as Belgium, France, Ireland, and Spain, which have a long history of regulating interest rates using usury laws (Maimbo and Gallegos 2014). The length of experience may have translated into best practices regarding implementation and the target of the IRC policy. Other countries may, therefore, aim to carry

out an in-depth analysis to determine whether the policies are context-dependent, as argued in the South Korean case (Crotty and Lee 2002; Demetriades and Luintel 2001).

Overall, the results suggest that interactions between external audit and IRC, as well as between IQ and IRC, play a significant role in determining the impact of IRC on SME credit constraint and finance access obstacles.

Table 4.11: Impact of Interaction Effects between IRC, External Audit, and IQ on SME Credit Constraint

The table reports coefficients estimated using an ordered Probit analysis to examine the impact of IRC on SME credit constraint and finance access obstacles. The main results are compared with interaction effects with external audit and institutional quality, which are presented in columns (2) and (4). In columns (1) and (2), the dependent variable is credit constraint, measured on a Likert scale with 1 indicating not credit constrained (NCC), 2 indicating maybe credit constrained (MCC), 3 indicating partially credit constrained (PCC), and 4 indicating fully credit constrained. In columns (3) and (4), the dependent variable is SME finance obstacle, also measured on a Likert scale, with 1 indicating no obstacle in accessing credit, 2 indicating minor obstacle, 3 indicating moderate obstacle, 4 indicating major obstacle, and 5 indicating very severe obstacle. The variable of interest is IRC status, a dummy variable equal to 1 if a country has adopted an IRC. Firm controls include international standard certification (ISC), ownership concentration, female ownership, foreign ownership, subsidiary status, and manager experience. In addition, size, industry, and year effects are included.

	(1)	(2)	(3)	(4)
	Main model	With interactions	Main model	With interactions
	SME credit constraint		*SME finance access obstacle*	
IRC status	0.010	-0.058**	0.022***	0.124***
	(1.21)	(-2.16)	(2.86)	(5.16)
External audit	-0.087***	-0.265***	-0.028***	0.072***
	(-11.54)	(-8.95)	(-4.07)	(2.66)
IRC # External audit		0.104***		0.059*
		(3.01)		(1.86)
IQ	-0.474***	-0.612***	-0.431***	-0.049
	(-26.22)	(-11.74)	(-25.32)	(-1.05)
IRC # IQ		0.015		-0.295***
		(0.26)		(-5.58)
External audit # IQ		0.192***		-0.306***
		(3.02)		(-5.17)
IRC# External audit # IQ		0.063		-0.022
		(0.87)		(-0.33)
Firm Controls				
ISC	-0.013	-0.015*	-0.082***	-0.079***
	(-1.50)	(-1.71)	(-10.08)	(-9.74)
Ownership conc.	0.034**	0.030**	-0.048***	-0.041***
	(2.53)	(2.23)	(-3.86)	(-3.29)
Female ownership	0.008	0.008	-0.023***	-0.021***
	(1.05)	(1.09)	(-3.28)	(-3.08)
Foreign ownership	-0.238***	-0.234***	-0.193***	-0.191***
	(-14.70)	(-14.48)	(-13.20)	(-13.05)
Subsidiary status	-0.073***	-0.076***	-0.036***	-0.034***
	(-7.66)	(-7.98)	(-4.03)	(-3.87)
Mgt. experience	-0.002***	-0.002***	-0.002***	-0.002***
	(-5.89)	(-5.56)	(-7.92)	(-8.00)
Size effect	yes	yes	yes	yes
Industry effect	yes	yes	yes	yes
Year effects	yes	yes	yes	yes
Observations	112,138	112,138	112,138	121,714
Log likelihood	-135862.57	-135791.89	-178336.9	-178239.89
Pseudo R^2	0.0220	0.0225	0.0166	0.0171

t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01

Impact of IRC on Bank Credit: Evidence from a Panel Analysis of Four Countries.

To further investigate the impact of IRC on credit supply, I analyzed panel data from four countries - Zambia, Kenya, El Salvador, and the Dominican Republic - using the World Bank Enterprise Surveys (WBES). These countries were selected because there was sufficient panel data available to execute panel regression analysis. Zambia introduced IRC in 2012 and dropped the policies in 2015. Kenya introduced IRC in 2016 and subsequently dropped the policies in 2019 (Calice et al. 2020). El Salvador established a usury bill in 2012 and effected the policy in 2013, while the Dominican Republic has subsidized interest rates on microcredit loans since 2012 (Maimbo and Gallegos 2014).

Previous studies have examined the effect of IRC on the supply of credit in Kenya, citing increased credit constraints and a flight of capital to less risky investments after the abolition of the policies (Alper et al. 2020; Ferrari et al. 2018; Safavian and Zia 2018). However, there is limited empirical evidence on the impact of IRC on the demand for credit by SMEs from banks.

Using XT-Tobit econometric models, I examined the impact of IRC on SME financing of working capital (WC) and fixed capital (FC) for each of the four countries. The results, presented in Table 4.12, indicate a negative impact of IRC on bank credit for working capital in the panels from Zambia, El Salvador, and the Dominican Republic, with significance levels of 10% and 5%, respectively. The IRC-FC-bank financing relationship was insignificant for Zambia, Kenya, and the Dominican Republic, but in El Salvador, there was a positive effect, significant at the 5% level. These differences in results may be due to institutional differences, suggesting that the effect of IRC is context-dependent and country-specific (Demetriades and Luintel 1997; Demetriades and Luintel 2001).

Overall, these findings suggest that IRC policies may negatively impact SMEs' access to credit from banks, especially for working capital.

Table 4.12: Panel analysis: The impact of IRC on bank credit

The table presents panel regression results on the impact of interest rate caps (IRC) on working capital (WC) and fixed capital (FC) through banks. A XTTOBIT analysis technique is used on WBES panel data on four countries: Zambia, Kenya, El Salvador, and Dominican Republic. The dependent variables are bank financing for working capital (WC) and fixed capital (FC). The variable of interest is IRC, a dummy variable indicating whether a country has adopted an interest rate cap. Firm-level controls used include external audit, international standards certification (ISC), ownership concentration, female ownership, foreign ownership, subsidiary status, and management experience. Size effects are included. The significance levels for the coefficients are indicated as follows: ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

	Zambia panel		Kenya Panel		El Salvador Panel		Dominican Republic panel	
	WC - Banks	FC - Banks	WC - Banks	FC - Banks	WC - Banks	FC - Banks	WC - Banks	FC - Banks
IRC	-0.086*	-0.031	-0.018	-0.043	-0.070*	0.168*	-0.090**	-0.129
	(-1.73)	(-0.26)	(-0.73)	(-0.68)	(-1.66)	(1.67)	(-2.36)	(-1.12)
External audit	0.285***	0.263**	0.095***	0.358***	0.147**	-0.051	0.045	-0.105
	(5.47)	(2.06)	(2.90)	(4.09)	(2.10)	(-0.22)	(1.11)	(-0.75)
ISC	0.050	0.260**	0.067**	-0.043	0.104	-0.027	-0.042	0.146
	(0.82)	(1.98)	(2.23)	(-0.61)	(1.63)	(-0.19)	(-0.79)	(1.10)
Ownership conc.	0.023	-0.112	-0.086*	-0.181	-0.082	-0.204	0.105	-0.229
	(0.24)	(-0.51)	(-1.89)	(-1.64)	(-1.01)	(-1.04)	(1.55)	(-1.07)
Female ownership	0.162***	0.102	-0.015	0.022	0.056	0.003	0.044	-0.011
	(3.59)	(0.96)	(-0.58)	(0.35)	(1.29)	(0.03)	(1.30)	(-0.10)
Foreign ownership	-0.161***	-0.561***	-0.098**	0.046	-0.215***	-0.536***	-0.022	-0.204
	(-2.72)	(-3.55)	(-2.03)	(0.43)	(-2.73)	(-3.01)	(-0.36)	(-1.17)
Subsidiary status	-0.005	0.058	0.008	-0.030	-0.010	-0.094	-0.029	0.072
	(-0.08)	(0.43)	(0.26)	(-0.42)	(-0.22)	(-0.83)	(-0.67)	(0.58)
Mgt. experience	0.003	-0.004	0.006***	0.003	0.001	0.002	-0.005***	-0.004
	(1.40)	(-0.74)	(5.03)	(1.22)	(0.87)	(0.34)	(-3.50)	(-0.87)
Size effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-0.029
Constant	-0.992***	-1.047***	-0.279***	-0.498***	-0.232**	-0.189	0.200***	0.234
	(-8.52)	(-4.03)	(-4.89)	(-3.59)	(-1.99)	(-0.57)	(2.75)	(1.02)
Sigma u	0.255***	0.304	0.188***	0.356***	0.355***	0.577***	0.175***	0.371**
	(3.42)	(0.97)	(4.54)	(2.67)	(7.84)	(5.69)	(4.39)	(2.06)
Sigma e	0.531***	0.831***	0.437***	0.690***	0.401***	0.618***	0.301***	0.532***
	(12.50)	(6.31)	(21.14)	(9.55)	(11.32)	(7.37)	(12.24)	(4.26)
Observations	1653	621	2206	1014	898	364	567	254

t statistics in parentheses. * p<0.10, ** p<0.05, *** p<0.01

4.5 Conclusion

In conclusion, this chapter investigates the impact of interest rate caps (IRC) on small and medium-sized enterprise (SME) financing. The findings reveal that introducing IRC in countries increases SME credit constraint, with smaller SMEs being more credit constrained compared to their larger counterparts. The study identifies a limitation of non-interest fees related to IRC, which alleviates SME credit constraint. The impact of IRC on SME finance is further analyzed based on regional and country heterogeneities, with results showing differences in results based on institutional factors and IRC features. The study also explores the impact of IRC on bank financing of SMEs' working capital and fixed capital, finding a negative effect on bank credit.

The findings of this study have significant policy implications for policymakers seeking to promote SME finance. The negative impact of IRC on SME financing suggests that policymakers may need to reconsider the use of IRC as a tool for improving SME financing, particularly in low- and middle-income countries (LMICs). Policymakers may need to explore alternative policy options, such as strengthening institutional quality, promoting financial sector development, and reducing corruption perception to promote SME financing. Additionally, policymakers may consider reducing non-interest fees related to IRC to alleviate the negative impact of IRC on SME credit constraint.

Industry practitioners and SMEs may benefit from understanding the potential impact of IRC on their access to finance and exploring alternative financing options. The findings suggest that SMEs may need to consider alternative financing options, such as equity financing, trade credit, and leasing. SMEs may also benefit from improving their financial reporting practices, including external audits, to improve their creditworthiness and alleviate credit constraint.

In conclusion, this chapter contributes to the ongoing debate on the effectiveness of interest rate caps in promoting SME financing and offers insights into the factors that may influence their impact. The study suggests that the effectiveness of IRC in improving SME financing is context-dependent and varies across countries and regions. Therefore, policymakers may need to adopt a nuanced approach in promoting SME financing, considering country-specific factors and the potential unintended consequences of policy interventions.

Chapter 5

Summary and policy implications

"Successful policy strategies aimed at SME finance should consider factors such as improving the regulatory environment, increasing financial literacy, strengthening institutional quality, and promoting public-private partnerships."

(World Bank, 2021).

5.0 Introduction.

Access to finance remains a significant challenge for small and medium-sized enterprises (SMEs) in developing countries. This chapter presents the policy implications arising from the three research projects in this thesis, which shed light on the challenges facing SMEs in accessing finance in developing countries and provide valuable insights into potential policy solutions to improve SME financing. The chapter is structured into three sections. Section 5.1 summarizes the key findings of the studies, highlighting the main results and key insights. Section 5.2 discusses feasible policy implications and recommendations arising from the research, while Section 5.3 identifies potential limitations of the studies and opportunities for future research.

The summary of the key findings reveals significant challenges to SME financing in developing countries, including institutional quality, financial development, corruption perception, and collateral requirements. The studies also found that interest rate caps can have negative unintended consequences on SME financing, with smaller SMEs being more adversely affected. The section provides a brief overview of the studies and their results, emphasizing their contributions to the understanding of SME financing in developing countries.

The section on policy implications and recommendations suggests feasible solutions to the challenges identified in the studies. Policymakers can focus on enhancing institutional quality, financial development, and reducing corruption levels to improve SME financing. Policymakers should also reconsider the use of collateral requirements and explore alternative policies such as credit guarantees, loan subsidies, and risk-sharing mechanisms. Promoting financial literacy and SME capacity building can also improve their creditworthiness and enable them to better navigate the financing landscape. The section provides specific recommendations and policy implications based on the findings of the studies, emphasizing their potential impact on SME financing in developing countries.

The section on limitations and future research opportunities highlights the potential limitations of the studies and identifies opportunities for future research. The section acknowledges that the studies do not cover all the factors affecting SME financing, and there may be other challenges that require further exploration. The section provides insights into potential areas of research, such as exploring the impact of political instability, cultural factors, and technological

advancements on SME financing. Additionally, the section highlights the need to assess the effectiveness of alternative policies in different contexts.

In conclusion, this chapter underscores the key policy implications and recommendations arising from the findings of the studies. The studies provide valuable insights into the challenges faced by SMEs in accessing finance in developing countries and identify potential policy solutions to improve SME financing. The section on future research opportunities identifies potential areas for further exploration and encourages policymakers, industry practitioners, and academics to build on these findings to promote SME financing in developing countries.

5.1 Key Findings from the Research Projects.

Research project 1: *The Impact of External Audit, International Standard Certification, and Government Contracts on SME Financing Accessibility: An Empirical Study.*

This study aimed to examine the impact of external audit, international standard certification, and government contracts on SME financing accessibility. The analysis utilized firm-level data from the WBES.

First, the study found that external audit improves SMEs' access to finance, which confirms the potential role of external audits in reducing information asymmetry between lenders and SMEs. The findings are consistent with previous studies that associate external audit with increased credit access for SMEs (Briozzo and Albanese 2020; Clatworthy and Peel 2013; Palazuelos et al. 2018). The results suggest that lenders may be more willing to provide loans to SMEs when they are subject to external audits, as these audits may offer a higher level of assurance and reduce the perceived risks associated with lending to these businesses.

Second, the study found that internationally recognized standard certificates (ISC) provide non-financial information that positively affects SMEs' access to finance. The study supports previous research that ISC is an effective tool for reducing informational asymmetry with lenders and improving SME access to credit (Fikru 2014; Grajek and Clougherty 2008; Ullah 2020). Additionally, the results show that ISC tools can promote sustainable production processes and reduce transaction costs, which could potentially enhance SME financing accessibility.

Third, the study found that government contracts have a negative influence on SMEs' access to finance, which are likely due to the challenges surrounding the public procurement process. The process is lengthy, bureaucratic, and expensive, and payment is often delayed, reducing the effectiveness of preferential procurement policies (Nielsen 2018). Furthermore, factors such as government effectiveness, corruption in procurement policies, and weak regulatory quality can negatively affect the relationship between the government and SMEs.

Overall, the findings of this study suggest that policymakers should focus on measures to enhance institutional quality, reduce corruption levels, promote financial literacy, and capacity building for SMEs to improve their creditworthiness and navigate the financing landscape more effectively. Policymakers should also reconsider the use of collateral requirements as a tool to mitigate risk and promote access to finance, as well as be cautious when using interest rate caps to promote SME financing. Instead, alternative policies such as credit guarantees, loan subsidies, and risk-sharing mechanisms may be more effective in improving SME access to finance. Additionally, future research could explore the impact of other factors such as political instability, cultural factors, and technological advancements on SME financing, as well as the effectiveness of alternative policies in improving SME financing accessibility.

Research project 2: *The Impact of International Financial Reporting Standards for SMEs, External Audit, and Institutional Quality on SME Finance: An Empirical Analysis.*

This study explores the impact of the adoption of International Financial Reporting Standards for Small and Medium-Sized Enterprises (IFRS for SMEs) on SME access to bank and trade credit. Using data from the WBES, as well as country-level data on the prevalence of IFRS for SME adoption, the study finds that the standardization of SME accounting and reporting practices has a positive impact on SME access to bank and trade credit. In addition, the length of IFRS for SME experience within a country improves the SME-bank and trade credit relationship. Previous studies have confirmed these findings (Cai et al. 2014; Houqe and Monem 2016; Tawiah and Gyapong 2021), with a longer IFRS experience enhancing training and resource allocation, ensuring proper use of the standards (Zhan et al. 2016c).

Furthermore, the study examines the interaction effects between IFRS for SME with external audit, and IFRS for SME with institutional quality. The results indicate that external audit positively moderates the relationship between IFRS for SME adoption and SME access to bank and trade credit. This finding supports the argument that external audit improves the reliability

and credibility of SME financial reporting, thus improving their access to credit (Amidu et al. 2019; Ibrahim and Muazu 2015). Additionally, the study finds that institutional quality positively moderates the relationship between IFRS for SME adoption and SME access to bank credit, suggesting that the effectiveness of IFRS for SME adoption in improving SME access to credit depends on the quality of institutions in the country. Previous research has also highlighted the importance of institutional quality in improving SME access to finance (Beck et al. 2005; Beck et al. 2014).

In summary, this study shows that the adoption of IFRS for SMEs, along with external audit and institutional quality, can positively impact SME access to bank and trade credit. Policymakers can leverage these findings to promote the adoption of IFRS for SMEs, as well as improve institutional quality and promote the use of external audit to enhance SME financing in developing countries.

Research project 3: *Assessing the Impact of Interest Rate Caps on Small and Medium Enterprises (SMEs) Financing: An Empirical Study.*

This study analyzes the impact of interest rate caps (IRC) on SME credit constraints. IRC is a subset of interest rate controls, which are government interventionist policies in the credit market. The data on IRC are obtained from the 2019 interest rate repression dataset (IRRD), and various World Bank reports are used to identify the years that countries introduced IRC and the policies used. The study uses firm-level data from the WBES to identify the variables of interest, including country adoption of IRC and whether there are limits on non-interest fees. The dependent variable used in the study is SME credit constraint, which reflects lower access to finance.

The results of the study indicate that IRC policies increase SME credit constraints, which is consistent with prior studies that associate IRC policies with a flight of capital (Cozarenco and Szafarz 2020; Heng 2015; Maimbo and Gallegos 2014; Safavian and Zia 2018). Additionally, the study finds that SMEs in countries with IRC that limit non-interest fees experience reduced credit constraints. In the absence of such a limitation, banks may maneuver around the stipulations by introducing "hidden" fees, rendering the policies ineffective (Fekrazad 2020; Ferrari et al. 2018; Maimbo and Gallegos 2014). Price transparency related to IRC can improve their effectiveness, as evidenced in South Africa and Thailand (Ferrari et al. 2018).

In conclusion, this study provides insights into the impact of IRC on SME financing, highlighting the negative effects of these policies on SME access to finance. The findings underscore the importance of policymakers taking a cautious approach to using IRC as a tool to promote SME financing. Instead, alternative policies such as credit guarantees, loan subsidies, and risk-sharing mechanisms may be more effective in improving SME access to finance. Policy papers that support the alternative tools include Beck et al. (2010), OECD (2013), Kucera and Heitfield (2017), Aterido et al. (2011), Klapper (2006), and AfDB (2014). These papers suggest alternative approaches to promoting SME financing, which can be more effective in enhancing SME access to finance than IRC policies.

5.2 Policy implications

5.2.1: External audit and ISC policies

Access to finance remains a major challenge for SMEs, and addressing this challenge is essential for achieving the United Nations' Sustainable Development Goals (SDGs), particularly Goal 8: Decent Work and Economic Growth, and Goal 16: Peace, Justice, and Strong Institutions. The literature on SME development identifies a lack of access to finance as the greatest obstacle affecting SME growth. To overcome this challenge, it is crucial to identify the problems hindering SME growth and offer practical solutions. This section presents policy recommendations to promote external audit and international standard certification (ISC) for SMEs, which have been found to improve SME access to finance and contribute to the achievement of SDGs 8 and 16.

The first policy recommendation for entrepreneurs is to engage the services of external auditors to audit their financial statements. This can significantly improve access to external credit for SMEs by bridging the information asymmetry gap and thus improving the trust relationship between lenders and SMEs. However, external audit services come with a cost implication, and entrepreneurs must conduct a cost-benefit analysis before hiring them. For entrepreneurs who cannot afford external audit services, there are alternative options, such as attending financial management training programs or incubation programs that provide leadership and management skills, accounting skills, and identification of key drivers to growth and development, among other skills. Additionally, entrepreneurs must maintain an orderly system of their transactions to make it easier to evaluate their creditworthiness.

For lenders, where there are no financial statements to analyze, they can access SME credit histories through credit reference agencies/bureaus. Policy makers can promote the financial architecture to alleviate information asymmetry. An enhancement in institutional quality within a country, through effective measures that curb complexities in the acquisition of financial records, can increase credit acquisition. For instance, governments can ensure there are centralized, transparent, and efficient records of business registration and ownership details.

The second policy recommendation for entrepreneurs is to acquire ISC, which provides non-financial information to reduce information asymmetry with lenders. Besides financial information, lenders evaluate the quality of the management of a business and their ability to service debt. ISC, such as ISO 9000, provide information on quality management and are associated with improvements in the operational performance of firms. SME acquisition of ISC, especially those in manufacturing and exports, increases sales, and thus improves their credit valuation reports. To make ISC more accessible for SMEs, governments can incentivize them through tax credits and subsidies. Additionally, governments can nurture the ISC industry by ensuring there are competitive accredited bodies to carry out the external audit in conformance with standards.

Moreover, certification schemes can benefit lenders to identify creditworthy SMEs. The schemes offer a reliable and comprehensive method to evaluate SMEs' creditworthiness, making it easier for lenders to assess the risks involved in providing credit. As such, policymakers can promote certification schemes for SMEs as a way to enhance access to finance, support SME growth, and achieve the SDGs promoted by the United Nations.

In summary, policymakers can promote external audit and ISC policies to enhance SME access to finance. Governments can offer incentives such as tax credits and subsidies to incentivize SMEs to acquire ISC, nurture the ISC industry, and promote certification schemes for SMEs to identify creditworthy SMEs. These policies can go a long way in promoting SME growth, reducing inequality, and promoting sustainable economic development.

5.2.2: Government procurement policies.

To improve the efficiency of public procurement processes, governments can take steps to reduce bureaucratic red tape and increase payment timeliness (OECD 2018). The bidding process can be streamlined to reduce its length and complexity, and clear timelines for payment can be established. This will help SMEs manage their cash flows better and reduce credit constraints arising from slow payment (Loader 2015).

Corruption is a significant challenge to public procurement processes and can exacerbate credit constraints for SMEs. It is imperative that policy makers tackle corruption in public procurement to ensure that the process is transparent, competitive, and fair. Corruption increases the cost of public procurement, reducing the value for money and quality of services and products delivered (Hope et al. 2021). Corruption also creates an uneven playing field for SMEs, as larger firms with greater resources are better placed to navigate the corrupt environment (Nielsen 2018).

Therefore, policy makers need to enact regulatory reforms that strengthen procurement systems, reduce corruption, and promote fair competition. This will ensure that SMEs can compete on a level playing field and that preferential public procurement policies achieve their intended purpose of spurring local economic development. By strengthening procurement systems and reducing corruption, policy makers can support SME growth and contribute to the attainment of the United Nations Sustainable Development Goals, particularly goals eight (decent work and economic growth) and sixteen (peace, justice, and strong institutions).

5.2.3: IFRS for SMEs policies.

Standardization of accounting and reporting practices through the international financial reporting standards for SMEs (IFRS for SME) improves bank and trade credit financing. A standardized reporting framework has a positive impact on the comparability of financial statements (Meshram and Arora 2021). The findings from chapter 3 of this thesis support the efficacy of the adoption of IFRS for SME-on-SME credit acquisition. Therefore, policy makers, standard setters such as the IASB, and multilateral lenders such as the IMF and the World Bank, should prioritize efforts to ensure the standards are widely adopted. Despite efforts being made, adoption of the reporting framework by countries has been slow, especially in countries with weak institutional quality. Therefore, policy makers need to help ensure adoption of the reporting framework, and enforcement mechanisms alongside the standards to improve their effectiveness.

Additionally, SMEs might lack understanding of the benefits of adopting the standards. To alleviate this, IASB training is available and can be used to educate SMEs on the benefits of adopting the standards. The IASB offers "IFRS for SME modules" that can be used to train SMEs (IFRS Foundation 2021a). The promotion of IFRS for SME should be a key policy priority in countries looking to enhance SME credit access. To achieve this, multilateral lenders and standard setters can work together to ensure that the standards are widely adopted, and that

SMEs have access to the necessary training and support. Efforts are already underway to achieve this objective. For example, the IASB and the World Bank have signed a memorandum of understanding to promote adoption of IFRS for SME in member countries (World Bank 2017). Furthermore, in countries in Europe where the standards have not acquired traction, efforts to promote adoption of the standards are ongoing through consultations (World Bank 2020).

5.2.4: Interest rate cap policies.

Interest rate caps or ceilings (IRC) have been associated with increased credit constraints on SMEs, particularly for small-sized SMEs compared to their larger counterparts (Ayyagari et al. 2014; Beck et al. 2015; Klapper et al. 2013). Several prior studies have also linked IRC with the shrinking of the credit market, particularly for smaller, younger, and poorer economic units, such as households and SMEs (Alper et al. 2020; Ferrari et al. 2018; Heng 2015; Maimbo and Gallegos 2014; Roa et al. 2021; Safavian and Zia 2018).

This study finds that IRC policies negatively impact SME access to finance. While introducing IRC is often reactionary, prompted by global economic shocks, such as the 2007-08 financial crisis and the COVID-19 pandemic (Calice et al. 2020), their adoption can lead to a flight of capital to government and corporate debt, as they are perceived as lower-risk investments. However, some countries such as Italy, France, and the UK have successfully used IRC to support their credit markets since the 1800s (Maimbo and Gallegos 2014). Policymakers should benchmark their IRC policies using countries that have used them most effectively. An essential feature of IRC, as demonstrated in the literature, is the adoption of a limit on non-interest rate fees (Ferrari et al. 2018; Maimbo and Gallegos 2014). Therefore, policymakers in countries that plan to implement IRC policies should focus on this feature to improve effectiveness.

To address the challenges associated with IRC policies, policymakers should evaluate their impact on credit access and consider alternative policies such as credit guarantees and risk-sharing mechanisms (Beck et al. 2015; Roa et al. 2021). Credit guarantees and risk-sharing mechanisms can help mitigate the negative effects of interest rate caps on credit markets while ensuring that the intended beneficiaries of these policies receive the necessary support. Policymakers must also ensure transparency in IRC policies to avoid hidden fees and effectively target the intended beneficiaries (Alper et al. 2020; Heng 2015).

In conclusion, while interest rate caps can be an effective policy tool to support credit markets during times of economic crisis, this study highlights the negative effects of these policies on SME access to finance. Policymakers must carefully evaluate the impact of these policies on credit access and consider alternative policies such as credit guarantees and risk-sharing mechanisms. Additionally, it is important to ensure transparency in IRC policies to avoid hidden fees and to effectively target the intended beneficiaries of these policies.

5.3 Limitation and recommendations for future studies

5.3.1 Recap of the study's research questions and findings.

The study investigated the impact of various policies on SME credit access. The research questions were divided into three projects. The first project explored the effect of external audit, ISC, and government contracts on SME credit acquisition. The study found that external audit and ISC policies promote credit access. However, government contracts are associated with increased credit constraints for SMEs. The second project analyzed the impact of IFRS for SME on credit access. The study found that adoption of IFRS for SME improves SME credit acquisition. Finally, the third project examined the impact of interest rate caps/ceilings (IRC) on SME credit access. The study found that IRC is associated with increased credit constraints for SMEs.

5.3.2 Discussion of Limitations and Suggestions for Future Research

This study has several limitations that need to be addressed in future research. One limitation of the study is the use of cross-sectional data from the WBES. Although the WBES provides rich firm-level data, only a small subset of it is a panel, which may limit the econometric methodology that can be employed in data analysis. Future researchers may consider using alternative panel datasets or leveraging the panel component of the WBES to allow for more robust analysis techniques.

Second, the use of dummy variables for the three variables of interest in the first project: external audit, international standard certification (ISC), and government contracts. While these variables have been widely used in prior research, different authors have varying interpretations of their effects. For example, as noted by Frankel et al. (2002), external audit has been linked to reduced information asymmetry, while other researchers have found that external audits have limited impact on financial reporting quality (Francis and Ke, 2006; DeFond and Zhang, 2014). Similarly, the impact of ISC on firm performance has been found

to be positive (Eggleton et al., 2014; Keh and Xie, 2009), negative (Dong et al., 2014), or insignificant (Jain et al., 2013). Therefore, future researchers may consider various alternatives to audit, such as using credit reference agencies, and may consider identifying a specific ISC in the evaluation of ISC impact, as the WBES does not provide information on the type of ISC a firm possesses. To build on this study, researchers may also consider using more comprehensive data sources, such as company financial statements, to construct more accurate measures of the variables of interest.

In light of the limitations surrounding the application of IFRS, future research should aim to contextualize their findings appropriately. For example, in the second project discussed in section 5.3.2, the study assumes that SMEs in adopting countries would be required to adopt IFRS for SMEs. However, this may not always be the case, as different countries may apply different scopes of IFRS. To address this limitation, future researchers could collect data from SMEs that specifically prepare their financial statements under the standardized reporting framework. This would provide a more accurate representation of the impact of IFRS on SMEs in different countries and ensure that their findings are appropriately contextualized (Daske and Gebhardt, 2006; Bloomfield et al., 2016; Mio et al., 2018). Therefore, acknowledging the limitations of the application of IFRS is crucial for future researchers to ensure that their findings are accurately interpreted and generalizable.

Fourth, the use of multiple data sources to construct the interest rate caps/ceilings (IRC) variable in the third project may limit the generalizability of the results, as combining data from different sources can introduce inconsistencies and potential biases in the analysis. Future researchers can consider more robust identification strategies by utilizing a single, comprehensive data source on the use of IRC policies, ensuring consistency and enhancing the generalizability of the findings.

Finally, the study focuses on only on a few policy interventions that affect SME credit access. Future research could expand on the study by examining other policy interventions, such as bankruptcy laws and collateral laws, and evaluating their effectiveness. Other considerations that future researchers may want to explore include:

- The impact of digital financial services on SME credit access, particularly in the context of developing countries where access to traditional financial services may be limited.
- The role of non-financial support services, such as mentoring and training, in improving SME credit access and overall development.

- The effectiveness of public-private partnerships in supporting SME development, particularly in the context of infrastructure development and access to finance.
- The impact of regional economic integration and trade agreements on SME credit access and development, particularly in developing countries.
- The role of gender in SME credit access and development, particularly in the context of policies and initiatives aimed at supporting women-led businesses.

To address these limitations and explore these research ideas, future research could consider using more robust econometric techniques, collecting more specific data on the variables of interest, and using more comprehensive datasets. Additionally, future research could consider conducting longitudinal studies to capture the effects of different economic cycles and changes in policy interventions on SME credit access and development. Collecting primary data, such as through surveys and interviews, can also provide a more in-depth understanding of SME credit access and development, particularly in developing countries where data may be limited.

5.4 Conclusion

The thesis concludes with significant contributions to the literature on SME development by systematically examining the impact of various policy interventions on SME credit access. The study finds that SMEs with external audits and international standard certifications face lower obstacles in accessing external finance, while SMEs with government contracts face higher obstacles. Adoption of the International Financial Reporting Standards for SMEs (IFRS for SME) is associated with improved bank and trade credit financing, while interest rate caps/ceilings (IRC) lead to increased SME credit constraints.

The study provides several policy implications. Policymakers can promote the adoption of external audits, ISC, and IFRS for SME to enhance SME credit access. However, care should be taken when implementing IRC policies, and policymakers should consider alternative policies, such as credit guarantees and risk-sharing mechanisms. Additionally, policy interventions should be tailored to the specific needs of SMEs in different countries.

The thesis has several key contributions. Firstly, it provides a comprehensive analysis of the impact of various policy interventions on SME credit access, using a rich dataset from the World Bank Enterprise Survey (WBES). Secondly, the study contributes to the literature on the effectiveness of external audits, ISC, and government contracts in enhancing SME credit access. Thirdly, the study highlights the importance of adopting IFRS for SME and provides

evidence of its positive impact on bank and trade credit financing. Finally, the study contributes to the understanding of the negative impact of interest rate caps/ceilings on SME credit access.

Overall, this thesis contributes to the literature on SME development and provides useful insights for policymakers and stakeholders in enhancing SME credit access. Further research can explore other policy interventions and factors that affect SME credit access and provide a more comprehensive understanding of SME development.

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Appendices

Appendix A1: Variables, description, and data sources.

Variables	Description	Source
Dependent Variables:		
Finance access	Ordinal variable that takes the value of 0 if the firm perceives access to finance to be no obstacle, 1 (minor obstacle), 2 (moderate obstacle), 3 (major obstacle) and 4 (very severe obstacle).	WBES
Credit constraint	An ordinal variable that takes the value 1 if a firm is not credit constrained (NCC), 2 Marginally credit constrained (MCC), 3 partially credit constrained (PCC), and 4 fully credit constrained.	WBES
WC: Banks	Continuous variable: "Percentage of working capital borrowed from banks in the last financial year?" (0.00-1.00)	WBES
WC: Trade credit	Continuous variable "Percentage of working capital borrowed from trade credit in the last financial year?" (0.00-1.00)	WBES
FC: Banks	Continuous variable "Percentage of fixed capital borrowed from banks in the last financial year?" (0.00-1.00)	WBES
Active credit	Binary variable: Does the firm have a line of credit or loan from a financial institution (1-Yes, 0-No)	*WBES*
Overdraft	Binary variable: Does the firm have an overdraft facility (1-Yes, 0-No)	*WBES*
Variables of interest:		
External Audit	Binary variable that takes the value of 1 if the firm has an external audit of its financials and 0 otherwise.	WBES
ISC	Binary variable that takes the value of 1 if the firm has an International Standard Certification and 0 otherwise.	WBES
Government contract	Binary variable that takes the value of 1 if the firm has applied and/or received a government contract in the recent fiscal year and 0 otherwise.	WBES
IFRS for SME adoption	Binary variable. Has the country adopted the International financial reporting standards for SMEs (1-Yes, 0-No)	*IASB/IFAC/IAS Plus*
IFRS for SME Mandate	Binary variable. Does the country require (mandate) or permit/allow (optional) the use of IFRS for SME (1-Require 0-permit)	*IASB/IFAC/IAS Plus*
IFRS for SME experience	Continuous variable: the period between country adoption of IFRS for SME and the survey.	*Author generated*
IQ	Continuous variable representing the institutional quality within a country. It is a composite index constructed using the principal component analysis (PCA) method of the six dimensions of governance.	*WGI*
IRC status	Dummy variable equals to 1 if a country has a lending rate cap interest rate control in the period of survey	IRRD
IRC Fees	Dummy variable equals to 1 if the IRC specifies limits on fees associated with the IRC	IRRD
Controls: Firm level		
Ownership concentration	Continuous variable indicating the percentage of ownership by the largest owner of the firm	WBES
Female ownership	Binary variable indicating whether the firm has any owners who are women	WBES
Foreign ownership	Continuous variable indicating the percentage of ownership by foreign entities	WBES
Subsidiary status	Binary variable indicating whether an SME is part of a larger firm	WBES
SME size	Ordinal variable that takes the value of 1 if the firm is small (5-19 employees) 2 if the firm is medium (20-99 employees), and 3 if the firm is large (over 99 employees).	WBES

Business legal status	Ordinal variable that takes the value of 1 if the firm is public (Shareholding company with traded shares) 2, If the company is a private firm (shareholding company with non-traded shares) 3, if the firm is a sole proprietorship 4, if the firm is a partnership and 5, if firm is a limited partnership and 6 for any other legal status.	WBES
Firm corruption perception	Ordinal variable that takes the value of 0 if the firm perceives corruption to be no obstacle, 1 (minor obstacle), 2 (moderate obstacle), 3 (major obstacle) and 4 (very severe obstacle).	WBES
Controls: Country-level		
Corruption Perception Index (CPI)	Continuous variable, which is a composite annual score ranging from 0 (highest)-100 (lowest) derived from various sources. It ranks countries based on corruption perception within a nation's public sector, as viewed by business executives and experts.	TI
Index of Financial development (FD)	Continuous variable that ranks countries in the depth, access, and efficiency of their respective financial institutions and financial markets. Theses index is an aggregate of the financial institutions index (FII) and financial markets index (FMI). The FII and FMI aggregate data on financial institutions and financial markets respectively based on depth, access, and efficiency.	IMF
Gross national income per capita (GNI)	An income measure which categorizes nations using the World Bank Atlas method within 4 categories depending on their GNI per capita. These are low-Income countries GNI below $1,046, lower middle-income country where GNI is between $1,046 and 4,095, upper middle-income country when GNI is between $4,095 and $12,695, and High-Income country with GNI above $12,695. Categorical variable low-income country merged with lower middle-income countries.	WDI
ROSC-AA	Continuous variable representing the number of reports on the Observance of Standards and Codes in a country	*IMF*
Region	Categorical variable: 1. AFR–Sub-Saharan Africa 2. EAP–East Asia and the Pacific 3. ECA–Europe and central Asia 4. LAC–Latin America and the Caribbean 5. MNA–Middle East and North Africa 6. SAR–South Asia Region.	*WBES*

Abbreviations: FC – fixed capital. GNI – gross national income. IASB/IFAC/IAS Plus - international accounting and standards board / international accounting standards Plus by Deloitte and Touche. IMF – International Monetary fund IQ – institutional quality. IRRD -Interest rate repression dataset. ISC – international standard certification. WBES- World Bank Enterprise survey WC -working capital. WGI – World Governance Indicators. ROSC – AA – Report on the observance of standards and codes – accounting and auditing. TI – Transparency international.

Appendix A.2: Tabulation of the greatest obstacles that affect SME operations.

The table presents the frequency statistics of the greatest obstacles that affect the operations of SMEs

Biggest obstacle affecting the operations of this establishment?	Frequency	Percent	Cum.
1-Access to finance	23429	14%	14%
2-Tax rates	21327	13%	27%
3-Electricity	19343	12%	39%
4-Practices of competitors in the informal sector	18616	11%	51%
5-Political instability	17133	10%	61%
6-Inadequately educated workforce	13590	8%	69%
7-Corruption	11813	7%	77%
8-Labor regulations	6092	4%	80%
9-Tax administration	5712	3%	84%
10-Crime, theft, and disorder	5558	3%	87%
11-Transport	5467	3%	91%
12-Customs and trade regulations	4753	3%	94%
13-Access to land	4636	3%	96%
14-Business licensing and permits	4303	3%	99%
15-Courts	1618	1%	100%
Total	163390	100.00	

Source: World Bank Enterprise Survey: 2006–2021 comprehensive dataset

The table presents mean statistics of the key variables of study grouped by country and region. The six regions are Sub-Saharan Africa (AFR), East Asia and the Pacific (EAP), Europe and Central Asia (ECA), Latin America and the Caribbean (LAC), Middle East and North Africa (MNA), and the South Asia Region (SAR). The mean statistics of finance access, credit constraint, external audit, international standards certification (ISC), government contracts, corruption perception index (CPI), index of financial development (FD), and institutional quality (IQ).

Panel A: AFR Country	Finance access	Credit constraint	External Audit	ISC	Govt. Contracts.	CPI	FDI	IQ
Angola	2.359	2.661	0.135	0.126	0.075	0.209	0.147	0.108
Benin	2.130	2.323	0.613	0.131	0.367	0.348	0.129	0.319
Botswana	1.695	1.674	0.701	0.175	0.530	0.606	0.267	0.697
Burkina Faso	3.008	2.653	0.508	0.174	0.417	0.368	0.113	0.401
Burundi	2.164	2.399	0.269	0.064	0.363	0.203	0.119	0.114
Cameroon	2.295	2.271	0.643	0.150	0.184	0.249	0.103	0.138
Cabo Verde	1.926	2.092	0.364	0.184	0.099	0.558	0.239	0.674
CAR	2.087	2.285	0.541	0.366	0.227	0.234	0.064	0.040
Chad	1.959	2.189	0.441	0.247	.2	0.195	0.093	0.056
Congo	2.107	2.582	0.622	0.238	0.259	0.213	0.068	0.111
Cote d'Ivoire	2.724	3.010	0.346	0.068	0.148	0.286	0.199	0.194
DRC	2.270	2.815	0.244	0.112	0.132	0.202	0.047	0.026
Eritrea	0.430	1.433	0.831	0.153	0.114	0.227	0.091	0.059
Eswatini	1.487	1.894	0.749	0.212	0.160	0.353	0.160	0.370
Ethiopia	1.672	2.599	0.683	0.106	0.294	0.314	0.134	0.317
Gabon	1.581	2.162	0.431	0.223	0.147	0.323	0.114	0.321
Gambia	2.065	2.669	0.332	0.199	0.311	0.299	0.089	0.357
Ghana	2.574	2.628	0.506	0.079	0.190	0.419	0.115	0.562
Guinea	2.230	2.623	0.195	0.046	0.271	0.237	0.077	0.066
Guinea-Bissau	2.912	3.369	0.082	0.076	.	0.179	0.065	0.065
Kenya	1.588	1.948	0.788	0.214	0.216	0.252	0.177	0.278
Lesotho	1.722	1.925	0.692	0.217	0.321	0.404	0.152	0.459
Liberia	1.845	2.381	0.302	0.027	0.216	0.326	0.161	0.180
Madagascar	1.603	2.191	0.478	0.140	0.139	0.281	0.095	0.256
Malawi	1.958	2.290	0.568	0.181	0.284	0.317	0.089	0.466
Mali	2.322	2.652	0.402	0.153	0.210	0.301	0.122	0.325
Mauritania	2.195	2.588	0.293	0.102	0.295	0.282	0.110	0.229
Mauritius	1.887	1.647	0.630	0.127	0.185	0.524	0.418	0.786
Mozambique	1.647	2.476	0.426	0.154	0.176	0.277	0.133	0.252
Namibia	1.678	1.739	0.761	0.137	0.266	0.483	0.355	0.608
Niger	1.808	2.129	.5	0.094	0.332	0.309	0.119	0.331
Nigeria	1.552	2.385	0.207	0.088	0.176	0.255	0.237	0.149
Rwanda	1.336	2.251	0.475	0.096	0.355	0.471	0.092	0.491
Senegal	2.243	2.574	0.262	0.062	0.122	0.394	0.136	0.472
Sierra Leone	1.953	2.796	0.287	0.173	0.122	0.279	0.072	0.205
Sierra Leone	2.444	2.664	0.276	0.092	.25	0.279	0.072	0.205
South Africa	0.737	1.527	0.574	0.184	0.062	0.444	0.579	0.567
South Sudan	2.383	2.486	0.287	0.026	0.148	0.131	0.062	0.023
Sudan	1.236	1.759	0.564	0.070	0.204	0.148	0.100	0.088
Tanzania	2.150	2.731	0.451	0.203	0.049	0.326	0.119	0.375
Togo	2.172	2.408	0.582	0.128	0.306	0.282	0.135	0.229
Uganda	2.017	2.402	0.471	0.169	0.143	0.263	0.109	0.433
Zambia	1.722	2.305	.6	0.146	0.187	0.339	0.113	0.404
Zimbabwe	2.523	2.888	0.605	0.219	0.203	0.218	.	0.041
Total	***1.879***	***2.329***	***0.471***	***0.137***	***0.195***	***0.307***	***0.175***	***0.302***
Panel B: EAP Country	Finance access	Credit constraint	External Audit	ISC	Govt. Contracts	CPI	FDI	IQ
Cambodia	1.218	1.614	.25	0.096	0.124	0.205	0.123	0.142
China	0.814	2.148	0.710	0.620	0.148	.38	0.567	0.410
Fiji	0.918	1.441	0.899	0.248	0.169	.	0.216	0.377
Indonesia	1.162	2.471	0.203	0.160	0.057	0.324	0.339	0.364
Lao PDR	1.165	1.972	0.235	0.094	0.106	0.251	0.154	0.196
Malaysia	1.372	2.018	0.465	0.303	0.194	0.491	0.650	0.673
Micronesia	1.419	2.224	0.254	0.063	0.176	.	0.127	0.554
Mongolia	1.844	2.436	0.827	0.140	0.348	0.342	0.313	0.444
Myanmar	0.992	1.919	0.229	0.035	0.039	0.213	0.126	0.085
Papua New Guinea	0.738	1.817	0.677	0.206	0.246	0.248	0.212	0.217
Philippines	0.843	1.564	0.879	0.247	0.091	0.317	0.359	0.380
Samoa	1.296	1.843	0.720	0.313	0.379	.	0.189	0.749
Solomon Islands	1.167	1.493	.86	0.064	0.238	0.357	0.091	0.379
Thailand	0.582	2.355	0.255	0.256	0.039	0.357	0.636	0.521
Timor-Leste	1.055	2.190	0.302	0.033	0.395	0.305	0.110	0.114
Tonga	1.455	2.555	0.514	0.163	.26	.	0.197	0.585
Vanuatu	1.587	1.518	0.445	0.272	0.216	0.386	0.183	0.628
Vietnam	0.982	1.822	0.341	0.206	0.178	0.309	0.307	0.433

	Finance access	Credit constraint	External Audit	ISC	Govt. Contracts	CPI	FDI	IQ
Total	*1.054*	*2.038*	*0.484*	*0.244*	*0.134*	*0.323*	*0.355*	*0.372*

Panel C: LAC Country	Finance access	Credit constraint	External Audit	ISC	Govt. Contracts	CPI	FDI	IQ
Albania	1.154	1.528	0.262	0.248	0.136	0.334	0.203	0.387
Armenia	1.787	2.092	0.223	0.197	0.171	0.341	0.203	0.438
Austria	0.283	1.221	0.797	0.348	0.085	0.759	0.674	0.974
Azerbaijan	1.211	2.146	0.398	0.177	0.173	0.266	0.167	0.259
Belarus	1.159	1.967	0.385	0.211	0.237	0.322	0.176	0.175
Belgium	0.674	1.455	0.664	0.344	0.170	0.746	0.591	0.891
Bosnia and Herzegovina	1.270	1.821	0.615	0.329	0.186	0.365	0.257	0.452
Bulgaria	1.044	1.796	0.459	0.358	0.130	0.404	0.375	0.524
Croatia	1.067	1.696	0.453	0.315	0.195	0.454	0.404	0.612
Cyprus	1.145	1.612	.7	0.401	0.202	0.601	0.574	0.818
Czech Republic	1.219	1.440	0.496	0.457	0.233	0.517	0.378	0.816
Denmark	0.552	1.259	0.982	0.487	0.216	.91	0.684	0.986
Estonia	0.487	1.469	0.524	0.251	0.284	0.686	0.356	0.866
Finland	0.633	1.458	0.960	0.458	0.133	0.895	0.668	0.996
Georgia	1.267	1.682	0.331	0.131	0.169	0.478	0.215	0.555
Greece	1.537	1.715	0.479	0.646	0.149	0.431	0.605	0.661
Hungary	0.507	1.547	0.514	0.498	0.060	0.496	0.490	0.723
Ireland	0.628	1.341	0.816	.49	0.182	0.739	0.732	0.927
Italy	1.268	1.888	0.212	0.744	0.024	0.465	0.777	0.635
Kazakhstan	1.186	1.896	0.234	0.160	0.223	0.283	0.335	0.314
Kosovo	1.879	1.750	0.233	0.191	0.204	0.339	.	0.369
Kyrgyz Republic	1.314	1.975	0.381	0.191	0.240	0.251	0.157	0.129
Latvia	1.106	1.564	0.529	0.289	0.299	0.521	0.315	0.759
Lithuania	1.050	1.604	0.324	0.202	0.182	0.548	0.283	0.765
Luxembourg	0.767	1.480	0.734	0.342	0.290	0.823	0.751	0.960
Moldova	1.299	1.973	0.251	0.155	0.264	0.321	0.363	0.406
Montenegro	0.993	2.070	0.447	0.266	0.170	0.418	.	0.551
Netherlands	0.615	1.273	0.838	0.479	0.153	0.847	0.751	0.963
North Macedonia	1.285	1.807	0.469	0.291	0.105	0.382	0.260	0.467
Poland	1.282	1.539	0.167	0.219	0.169	0.554	0.471	0.695
Portugal	1.232	1.468	0.433	0.213	0.086	0.626	0.702	0.832
Romania	1.600	1.927	0.358	0.395	0.171	0.419	0.291	0.599
Russia	1.409	2.069	0.256	0.127	0.267	0.265	0.492	0.233
Serbia	1.206	1.902	0.572	0.353	0.186	0.379	0.248	0.453
Slovak Republic	1.128	1.570	0.454	0.406	0.069	.48	0.305	0.683
Slovenia	0.954	1.555	0.348	0.365	0.311	.61	0.481	0.821
Sweden	0.578	1.370	0.973	0.642	0.156	0.888	0.753	0.983
Tajikistan	1.079	1.863	0.287	0.130	0.226	0.229	0.087	0.099
Turkey	1.189	1.764	0.473	0.431	0.149	0.432	0.486	0.522
Ukraine	1.859	2.389	0.297	0.187	0.179	0.273	0.234	0.252
Uzbekistan	0.721	1.877	0.268	0.147	0.135	0.195	0.222	0.096
Total	*1.175*	*1.789*	*0.414*	*0.289*	*0.184*	*0.432*	*0.398*	*0.510*

Panel D: LAC Country	Finance access	Credit constraint	External Audit	ISC	Govt. Contracts	CPI	FDI	IQ
Antigua and Barbuda	2.013	1.909	0.527	0.033	0.152	.	0.313	0.728
Argentina	1.913	2.115	0.648	0.274	0.150	0.345	0.336	0.332
Bahamas	1.088	2	0.603	0.382	0.272	.68	0.440	0.698
Barbados	1.852	1.662	0.832	0.281	0.260	0.704	0.449	0.795
Belize	2.593	1.952	0.687	0.027	0.194	.	0.219	0.347
Bolivia	1.517	1.947	0.777	0.201	0.298	0.313	0.205	0.144
Brazil	2.338	1.951	0.226	0.191	0.111	0.381	0.582	0.497
Chile	1.336	1.801	0.513	0.306	0.202	0.698	0.504	0.868
Colombia	1.680	1.944	0.586	0.223	0.264	0.368	0.356	0.420
Cost Arica	2.064	1.852	0.602	0.166	0.258	0.532	0.249	0.670
Dominica	2.607	2.045	.48	.02	0.113	0.557	0.233	0.717
Dominican Rep.	1.369	1.547	0.745	0.117	0.117	0.297	0.152	0.343
Ecuador	1.524	1.804	0.547	0.193	0.286	0.305	0.194	0.176
El Salvador	1.521	1.895	0.872	0.148	0.219	.37	0.235	0.280
Grenada	1.497	1.695	0.605	0.333	0.183	0.419	0.319	0.600
Guatemala	1.429	1.738	0.664	0.157	0.160	0.286	0.226	0.146
Guyana	1.311	1.690	0.915	0.308	.4	0.307	0.173	0.376
Honduras	1.474	1.922	0.640	0.171	0.137	0.269	0.203	0.163
Jamaica	1.722	1.917	0.763	0.231	0.167	0.383	0.269	0.447
Mexico	1.445	1.753	0.458	0.247	0.165	.32	0.392	0.340
Nicaragua	1.241	1.772	0.500	0.155	0.217	0.259	0.131	0.237
Panama	0.883	1.588	0.727	0.169	0.020	0.355	0.327	0.521
Paraguay	1.373	1.780	0.398	0.117	0.248	0.257	0.117	0.250
Peru	1.239	1.950	0.344	0.209	0.226	0.361	0.320	0.330

E

	Finance access	Credit constraint	External Audit	ISC	Govt. Contracts	CPI	FDI	IQ
St Kitts and Nevis	1.939	1.798	0.689	0.214	0.208	.	0.347	0.703
St Lucia	2.213	1.912	0.473	0.013	0.122	0.645	0.347	0.731
St Vincent and Grenadines	1.405	1.792	0.787	.24	0.209	0.605	0.213	0.726
Suriname	1.331	2.047	0.617	0.228	0.076	0.374	0.186	0.510
Trinidad and Tobago	1.780	2.048	0.820	0.166	0.248	0.373	0.327	0.507
Uruguay	1.392	1.896	0.396	0.147	0.193	0.708	0.218	0.714
Venezuela	1.227	1.811	0.764	0.185	0.138	0.183	0.217	0.012
Total	*1.547*	*1.876*	*0.564*	*0.202*	*0.193*	*0.381*	*0.304*	*0.387*

Panel E: MNA Country	Finance access	Credit constraint	External Audit	ISC	Govt. Contracts	CPI	FDI	IQ
Djibouti	1.110	1.436	0.456	0.176	0.120	0.319	0.162	0.225
Egypt	1.407	1.602	0.791	0.223	0.114	0.325	0.333	0.404
Iraq	2.130	2.480	0.425	0.024	0.207	0.171	.	0.033
Israel	0.525	1.434	0.935	0.373	0.187	0.606	0.583	0.800
Jordan	1.695	1.8	0.531	0.199	0.155	0.483	0.454	0.622
Lebanon	1.796	1.817	0.855	0.174	0.088	0.283	0.333	0.250
Malta	0.758	1.272	0.909	0.279	0.321	0.565	0.560	0.862
Morocco	1.562	2.121	0.421	0.138	0.212	.	.	.
Tunisia	1.790	2.032	0.542	0.267	0.218	0.418	0.247	0.549
West Bank and Gaza	1.810	1.496	0.795	0.105	0.162	.	.	0.386
Yemen	1.638	2.009	0.335	0.144	0.136	0.191	0.130	0.089
Total	*1.521*	*1.744*	*0.686*	*0.199*	*0.145*	*0.341*	*0.333*	*0.401*

Panel F: SAR Country	Finance access	Credit constraint	External Audit	ISC	Govt. Contracts	CPI	FDI	IQ
Afghanistan	2.054	2.361	0.348	0.133	0.186	0.136	.	0.024
Bangladesh	1.752	2.184	0.427	0.178	0.104	0.249	0.172	0.252
Bhutan	1.398	1.937	0.495	0.083	0.378	0.621	0.183	0.653
India	1.157	2.286	0.832	0.449	0.161	0.368	0.423	0.546
Nepal	1.532	2.058	0.800	0.103	0.064	0.283	0.193	0.280
Pakistan	1.299	2.003	0.342	0.270	0.090	0.281	0.252	0.231
Sri Lanka	1.604	2.450	0.653	0.162	0.086	0.358	0.280	0.539
Total	*1.366*	*2.228*	*0.660*	*0.326*	*0.146*	*0.327*	*0.330*	*0.418*

F

Appendix A.3: Cross tabulation between credit constraint and finance access variable

The table presents a cross-tabulation between the subjective measure of access to credit Finance access against the objective measure, credit constraint. The results are in two formats, actual frequency statistics in the prior row followed by the relative weights in percentages.

Finance Access	Credit constraint				
	NCC	MCC	PCC	FCC	Total
No obstacle	36352	8283	3559	4492	52686
	50.29%	28.67%	15.61%	19.76%	35.91%
Minor obstacle	14954	5689	4189	4222	29054
	20.69%	19.69%	18.37%	18.58%	19.80%
Moderate obstacle	12231	7618	6046	5596	31491
	16.92%	26.37%	26.51%	24.62%	21.47%
Major obstacle	6100	4819	5840	5171	21930
	8.44%	16.68%	25.61%	22.75%	14.95%
Very severe obstacle	2648	2480	3171	3247	11546
	3.66%	8.58%	13.90%	14.29%	7.87%
Total	72285	28889	22805	22728	146707
	100.00%	100.00%	100.00%	100.00%	100.00%

Appendix A.4: Pairwise comparisons of means of finance access and credit constraint across regions.

The table presents pairwise comparisons of means using the Duncan estimation technique for finance access and credit constraint. The contrast, standard error, t value and the probability are presented. Fifteen pairwise comparisons are estimated. Two panels are presented Panel A: finance access differences and Panel B credit constraint differences.

Panel A: Finance access	Contrast	St. Err.	t	P>t
EAP Vs AFR	-0.825	0.012	-68.02	0.000
ECA vs AFR	-0.704	0.009	-77.90	0.000
LAC vs AFR	-0.333	0.010	-32.80	0.000
MNA vs AFR	-0.358	0.012	-28.67	0.000
SAR vs AFR	-0.514	0.012	-42.19	0.000
ECA vs EAP	0.121	0.011	10.72	0.000
LAC vs EAP	0.492	0.012	40.37	0.000
MNA vs EAP	0.467	0.014	32.90	0.000
SAR vs EAP	0.311	0.014	22.37	0.000
LAC vs ECA	0.371	0.009	40.71	0.000
MNA vs ECA	0.346	0.012	29.67	0.000
SAR vs ECA	0.190	0.011	16.81	0.000
MNA vs LAC	-0.025	0.013	-2.00	0.045
SAR vs LAC	-0.181	0.012	-14.77	0.000
SAR vs MNA	-0.156	0.014	-10.93	0.000
Panel B: Credit constraint	Contrast	St. Err.	t	P>t
EAP Vs AFR	-0.291	0.011	-26.47	0.000
ECA vs AFR	-0.540	0.008	-66.88	0.000
LAC vs AFR	-0.452	0.009	-49.56	0.000
MNA vs AFR	-0.584	0.011	-52.33	0.000
SAR vs AFR	-0.101	0.011	-9.03	0.000
ECA vs EAP	-0.249	0.010	-24.16	0.000
LAC vs EAP	-0.161	0.011	-14.46	0.000
MNA vs EAP	-0.294	0.013	-22.79	0.000
SAR vs EAP	0.190	0.013	14.71	0.000
LAC vs ECA	0.088	0.008	10.59	0.000
MNA vs ECA	-0.044	0.011	-4.23	0.000
SAR vs ECA	0.439	0.011	41.69	0.000
MNA vs LAC	-0.132	0.011	-11.67	0.000
SAR vs LAC	0.351	0.011	30.92	0.000
SAR vs MNA	0.483	0.013	37.03	0.000

Appendix A.5: Pairwise comparisons of means External audit, ISC, government contracts across regions.

The table presents pairwise comparisons of means using the Duncan estimation technique. The presentation format contrast, standard error, t value and the probability. Fifteen pairwise comparisons, each of the three variables of interest in three panels. Panel A: External audit, Panel B: International standard certification (ISC), and Panel C. Government contracts (Govt. contracts).

Panel A: External audit	Contrast	St. Err.	t	P>t
EAP Vs AFR	0.0134	0.0046	2.93	0.003
ECA vs AFR	-0.0567	0.0034	-16.80	0.000
LAC vs AFR	0.0933	0.0038	24.51	0.000
MNA vs AFR	0.2152	0.0047	45.75	0.000
SAR vs AFR	0.1895	0.0046	41.17	0.000
ECA vs EAP	-0.0701	0.0043	-16.32	0.000
LAC vs EAP	0.0799	0.0046	17.21	0.000
MNA vs EAP	0.2018	0.0054	37.36	0.000
SAR vs EAP	0.1761	0.0053	33.15	0.000
LAC vs ECA	0.1499	0.0035	43.29	0.000
MNA vs ECA	0.2718	0.0044	61.35	0.000
SAR vs ECA	0.2461	0.0043	56.93	0.000
MNA vs LAC	0.1219	0.0048	25.57	0.000
SAR vs LAC	0.0962	0.0047	20.61	0.000
SAR vs MNA	-0.0257	0.0054	-4.73	0.000
Panel B: ISC	Contrast	St. Err.	t	P>t
EAP Vs AFR	0.1070	0.0039	27.34	0.000
ECA vs AFR	0.1525	0.0029	52.63	0.000
LAC vs AFR	0.0657	0.0033	20.04	0.000
MNA vs AFR	0.0623	0.0040	15.43	0.000
SAR vs AFR	0.1892	0.0039	48.17	0.000
ECA vs EAP	0.0455	0.0037	12.44	0.000
LAC vs EAP	-0.0413	0.0040	-10.39	0.000
MNA vs EAP	-0.0447	0.0046	-9.69	0.000
SAR vs EAP	0.0822	0.0045	18.18	0.000
LAC vs ECA	-0.0868	0.0030	-29.19	0.000
MNA vs ECA	-0.0902	0.0038	-23.80	0.000
SAR vs ECA	0.0366	0.0037	9.97	0.000
MNA vs LAC	-0.0034	0.0041	-0.84	0.401
SAR vs LAC	0.1235	0.0040	30.99	0.000
SAR vs MNA	0.1269	0.0046	27.43	0.000
Panel C: Govt. contracts	Contrast	St. Err.	t	P>t
EAP Vs AFR	-0.0605	0.0037	-16.31	0.000
ECA vs AFR	-0.0106	0.0028	-3.74	0.000
LAC vs AFR	-0.0020	0.0035	-0.59	0.556
MNA vs AFR	-0.0500	0.0038	-13.21	0.000
SAR vs AFR	-0.0491	0.0038	-13.00	0.000
ECA vs EAP	0.0500	0.0033	15.04	0.000
LAC vs EAP	0.0585	0.0039	15.02	0.000
MNA vs EAP	0.0105	0.0042	2.53	0.011
SAR vs EAP	0.0114	0.0042	2.74	0.009
LAC vs ECA	0.0085	0.0031	2.78	0.005
MNA vs ECA	-0.0394	0.0034	-11.58	0.000
SAR vs ECA	-0.0386	0.0034	-11.36	0.000
MNA vs LAC	-0.0479	0.0040	-12.10	0.000
SAR vs LAC	-0.0471	0.0040	-11.90	0.000
SAR vs MNA	0.0009	0.0042	0.20	0.838

Appendix A.6: Pairwise comparisons of means CPI, FD, and IQ across regions

The table presents pairwise comparisons of means using the Duncan estimation technique. The presentation format contrast, standard error, t value and the probability. Fifteen pairwise comparisons, each of the three institutional settings in three panels. Panel A: corruption perception index (CPI), Panel B: index of financial development (FD), and Panel C. institutional quality (IQ).

Panel A: CPI	Contrast	St. Err.	t	P>t
EAP Vs AFR	0.016	0.0012	13.15	0.000
ECA vs AFR	0.125	0.0009	138.21	0.000
LAC vs AFR	0.074	0.0010	72.43	0.000
MNA vs AFR	0.034	0.0013	25.29	0.000
SAR vs AFR	0.020	0.0012	16.03	0.000
ECA vs EAP	0.108	0.0012	93.97	0.000
LAC vs EAP	0.058	0.0013	46.30	0.000
MNA vs EAP	0.017	0.0015	11.53	0.000
SAR vs EAP	0.004	0.0014	2.47	0.013
LAC vs ECA	-0.051	0.0009	-54.25	0.000
MNA vs ECA	-0.091	0.0013	-72.30	0.000
SAR vs ECA	-0.105	0.0012	-90.97	0.000
MNA vs LAC	-0.040	0.0013	-30.03	0.000
SAR vs LAC	-0.054	0.0013	-43.50	0.000
SAR vs MNA	-0.014	0.0015	-9.20	0.000
Panel B: FD	Contrast	St. Err.	t	P>t
EAP Vs AFR	0.180	0.0013	137.54	0.000
ECA vs AFR	0.223	0.0010	228.12	0.000
LAC vs AFR	0.129	0.0011	117.46	0.000
MNA vs AFR	0.158	0.0015	108.54	0.000
SAR vs AFR	0.155	0.0013	115.32	0.000
ECA vs EAP	0.043	0.0012	35.17	0.000
LAC vs EAP	-0.051	0.0013	-38.61	0.000
MNA vs EAP	-0.022	0.0016	-13.53	0.000
SAR vs EAP	-0.025	0.0015	-16.22	0.000
LAC vs ECA	-0.094	0.0010	-94.55	0.000
MNA vs ECA	-0.065	0.0014	-47.20	0.000
SAR vs ECA	-0.068	0.0013	-53.78	0.000
MNA vs LAC	0.029	0.0015	19.75	0.000
SAR vs LAC	0.026	0.0014	19.27	0.000
SAR vs MNA	-0.003	0.0017	-1.69	0.091
Panel C: IQ	Contrast	St. Err.	t	P>t
EAP Vs AFR	0.071	0.0019	36.69	0.000
ECA vs AFR	0.208	0.0014	145.91	0.000
LAC vs AFR	0.086	0.0016	53.21	0.000
MNA vs AFR	0.099	0.0021	48.34	0.000
SAR vs AFR	0.116	0.0019	59.80	0.000
ECA vs EAP	0.137	0.0018	76.09	0.000
LAC vs EAP	0.015	0.0020	7.72	0.000
MNA vs EAP	0.029	0.0023	12.35	0.000
SAR vs EAP	0.045	0.0022	20.35	0.000
LAC vs ECA	-0.122	0.0015	-83.40	0.000
MNA vs ECA	-0.108	0.0019	-55.74	0.000
SAR vs ECA	-0.092	0.0018	-50.37	0.000
MNA vs LAC	0.014	0.0021	6.60	0.000
SAR vs LAC	0.030	0.0020	15.42	0.000
SAR vs MNA	0.017	0.0024	7.08	0.000

Appendix A.7: List of countries that have adopted IFRS for SME

The table presents the number of countries with IFRS for SME in the sample, the legal mandate, and the effective year of the standards in the countries.

#	country	IFRS for SME Adoption status	IFRS for SME Legal mandate	Effective year
1	Azerbaijan	Yes	Required/Mandated	2018
2	Bhutan	Yes	Required/Mandated	2014
3	Brazil	Yes	Required/Mandated	2009
4	Cambodia	Yes	Required/Mandated	2012
5	Colombia	Yes	Required/Mandated	2016
6	Cost Arica	Yes	Required/Mandated	2009
7	Dominican Republic	Yes	Required/Mandated	2014
8	El Salvador	Yes	Required/Mandated	2010
9	Fiji	Yes	Required/Mandated	N/A
10	Georgia	Yes	Required/Mandated	2015
11	Ghana	Yes	Required/Mandated	2010
12	Kyrgyz Republic	Yes	Required/Mandated	2013
13	Lesotho	Yes	Required/Mandated	2011
14	Liberia	Yes	Required/Mandated	N/A
15	Malawi	Yes	Required/Mandated	2013
16	Mauritius	Yes	Required/Mandated	2009
17	North Macedonia	Yes	Required/Mandated	2011
18	Rwanda	Yes	Required/Mandated	2009
19	Serbia	Yes	Required/Mandated	2013
20	South Africa	Yes	Required/Mandated	2013
21	Argentina	Yes	Permitted/allowed	2011
22	Armenia	Yes	Permitted/allowed	2009
23	Bahamas	Yes	Permitted/allowed	N/A
24	Barbados	Yes	Permitted/allowed	2010
25	Bosnia and Herzegovina	Yes	Permitted/allowed	2011
26	Botswana	Yes	Permitted/allowed	2010
27	Ecuador	Yes	Permitted/allowed	2012
28	Eswatini	Yes	Permitted/allowed	2010
29	Gambia	Yes	Permitted/allowed	2016
30	Grenada	Yes	Permitted/allowed	N/A
31	Guatemala	Yes	Permitted/allowed	2011
32	Guyana	Yes	Permitted/allowed	2010
33	Honduras	Yes	Permitted/allowed	2016
34	Ireland	Yes	Permitted/allowed	2015
35	Israel	Yes	Permitted/allowed	2011
36	Jamaica	Yes	Permitted/allowed	N/A
37	Jordan	Yes	Permitted/allowed	N/A
38	Kazakhstan	Yes	Permitted/allowed	2015
39	Kenya	Yes	Permitted/allowed	2010
40	Kosovo	Yes	Permitted/allowed	2015
41	Madagascar	Yes	Permitted/allowed	N/A
42	Malaysia	Yes	Permitted/allowed	2015
43	Myanmar	Yes	Permitted/allowed	2010
44	Namibia	Yes	Permitted/allowed	2010
45	Nicaragua	Yes	Permitted/allowed	2011
46	Nigeria	Yes	Permitted/allowed	2014
47	Peru	Yes	Permitted/allowed	2011
48	Philippines	Yes	Permitted/allowed	2010
49	Sierra Leone	Yes	Permitted/allowed	2011
50	Suriname	Yes	Permitted/allowed	2010
51	Tanzania	Yes	Permitted/allowed	2012
52	Trinidad and Tobago	Yes	Permitted/allowed	2010
53	Ukraine	Yes	Permitted/allowed	2013
54	Uruguay	Yes	Permitted/allowed	2015
55	Zambia	Yes	Permitted/allowed	2012
56	Zimbabwe	Yes	Permitted/allowed	2011

Appendix A.8: Frequency statistics of SMEs by countries with and without IRC

Country	IRC present	IRC absent	N
Countries that have or have had IRC during the WBES			
India	0	9281	9281
Egypt	0	7786	7786
Russia	0	6547	6547
Nigeria	0	4567	4567
Argentina	0	3108	3108
Turkey	1152	3007	4159
Colombia	0	2935	2935
China	0	2700	2700
Bulgaria	0	2368	2368
Poland	0	2366	2366
Pakistan	0	2182	2182
Chile	0	2050	2050
Vietnam	0	2049	2049
South Africa	0	2034	2034
Uzbekistan	0	1995	1995
Brazil	0	1802	1802
France	0	1566	1566
Morocco	0	1503	1503
Ethiopia	0	1492	1492
Bangladesh	1504	1442	2946
Croatia	0	1397	1397
Bolivia	0	1339	1339
Paraguay	0	1338	1338
Lao PDR	0	1330	1330
Georgia	0	1314	1314
Armenia	0	1280	1280
Myanmar	0	1239	1239
Ghana	0	1214	1214
Tunisia	0	1207	1207
Sweden	0	1191	1191
Nicaragua	0	1147	1147
Honduras	0	1128	1128
Senegal	0	1107	1107
North Macedonia	0	1086	1086
Portugal	0	1062	1062
Spain	0	1051	1051
Mali	0	1035	1035
Kenya	1438	1001	2439
Thailand	0	1000	1000
Slovak Republic	0	972	972
Latvia	0	966	966
Slovenia	0	955	955
Uruguay	621	954	1575
Namibia	0	909	909
Estonia	0	906	906
Cote d'Ivoire	0	887	887
Venezuela	0	820	820
Netherlands	0	808	808
Italy	0	760	760
Finland	0	759	759
Zambia	1085	720	1805
El Salvador	1053	719	1772
Sudan	0	662	662
Kyrgyz Republic	235	630	865
Lithuania	276	628	904
Belgium	0	614	614
Ireland	0	606	606
Panama	365	604	969
Greece	0	600	600
Israel	0	483	483
Burkina Faso	0	394	394
Jamaica	0	376	376
Guinea	0	373	373
Cameroon	363	361	724
Ecuador	1024	361	1385
Dominican Republic	360	359	719
Togo	0	305	305
Niger	0	301	301
Benin	0	300	300
Malta	0	242	242
Eritrea	0	179	179
Guinea Bissau	0	159	159
Chad	150	153	303
Bahamas	0	150	150
Mauritania	237	150	387
Countries without IRC			
Albania	1041	0	1041
Antigua and Barbuda	151	0	151
Austria	600	0	600
Azerbaijan	995	0	995
Bosnia and Herzegovina	1083	0	1083
Botswana	610	0	610
CAR	150	0	150
Cambodia	845	0	845
Congo	151	0	151
Costa Rica	538	0	538

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Cyprus	240	0	240		Mexico	2960	0	2960
Czech Republic	1006	0	1006		Moldova	1083	0	1083
Denmark	995	0	995		Peru	2635	0	2635
Dominica	150	0	150		Philippines	2661	0	2661
Gabon	179	0	179		Romania	1895	0	1895
Grenada	153	0	153		Serbia	361	0	361
Guatemala	1457	0	1457		Sri Lanka	610	0	610
Guyana	165	0	165		St. Kitts and Nevis	150	0	150
Indonesia	2764	0	2764		St. Lucia	150	0	150
Iraq	756	0	756		St. Vincent and the Grenadines	154	0	154
Jordan	1174	0	1174		Ukraine	3190	0	3190
Kosovo	743	0	743		Total	42658	105371	148029
Malaysia	1000	0	1000					

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Appendix A.9: Tabulation of countries by non-interest fee limitation

Full country name	Limits on non-interest fees associated with IRC		
	No	Yes	Total
Antigua and Barbuda	151	0	151
Argentina	3108	0	3108
Armenia	1280	0	1280
Belgium	0	614	614
Benin	300	0	300
Bolivia	1339	0	1339
Brazil	0	1802	1802
Bulgaria	0	2368	2368
Burkina Faso	394	0	394
Chile	0	2050	2050
Colombia	2935	0	2935
Croatia	0	1397	1397
Dominica	150	0	150
Ecuador	0	1385	1385
El Salvador	1772	0	1772
Ethiopia	1492	0	1492
Finland	0	759	759
France	0	1566	1566
Georgia	0	1314	1314
Grenada	153	0	153
India	0	9281	9281
Israel	483	0	483
Italy	0	760	760
Jamaica	0	376	376
Kyrgyz Republic	0	865	865
Latvia	966	0	966
Lithuania	0	904	904
Mali	1035	0	1035
Mauritania	0	387	387
Morocco	0	1503	1503
Netherlands	808	0	808
Niger	301	0	301
North Macedonia	1086	0	1086
Pakistan	0	2182	2182
Paraguay	1338	0	1338
Portugal	0	1062	1062
Russia	0	6547	6547
Senegal	1107	0	1107
South Africa	0	2034	2034
Spain	0	1051	1051
Sri Lanka	0	610	610
St. Kitts And Nevis	150	0	150
St. Lucia	150	0	150
St. Vincent And the Grenadines	154	0	154
Sweden	0	1191	1191
Thailand	0	1000	1000
Togo	305	0	305
Uruguay	0	1575	1575
Uzbekistan	0	1995	1995
Vietnam	2049	0	2049
Total	23006	46578	69584

Source: firm-level data from the WBES, Country IRC data from the survey of interest rate controls 2019 (Calice et al. 2020)

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Appendix A.10: PCA statistics: Construction of IQ variable

The table presents the correlation matrix between the six indicators of governance from the world governance indicators in Panel A, while panel B presents the principal component analysis (PCA) statistics. The statistics help construct the institutional quality (IQ) variable using the PCA dimensionality-reduction method. The six dimensions of the WGI are (1) Voice and accountability (VA) (2) Political stability and absence of violence/terrorism (PVT) (3) Government Effectiveness (GE) (5) Regulatory quality (RQ) and (6) Control of corruption (CCPT).

Panel A: Pearson's correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) VA	1.000					
(2) PVT	0.721*	1.000				
(3) GE	0.754*	0.712*	1.000			
(4) RQ	0.761*	0.658*	0.930*	1.000		
(5) RL	0.831*	0.798*	0.922*	0.891*	1.000	
(6) CCPT	0.792*	0.783*	0.908*	0.852*	0.936*	1.000

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

Panel B: Principal components (eigenvectors)

Variable	Comp 1	Comp 2	Comp 3	Comp 4	Comp 5	Comp 6	Unexplained
VA	0.389	0.211	0.885	0.009	0.146	0.013	0
PVT	0.371	0.785	-0.364	0.325	0.058	0.071	0
GE	0.420	-0.352	-0.218	0.064	0.739	-0.317	0
RQ	0.410	-0.460	-0.026	0.586	-0.339	0.401	0
RL	0.432	-0.049	-0.074	-0.211	-0.560	-0.669	0
CCPT	0.424	-0.035	-0.175	-0.708	-0.019	0.535	0

Panel C: Principal components/correlation: Rotation: (unrotated = principal)

Eigenvalue	5.099	0.403	0.269	0.123	0.055	0.051
Difference	4.695	0.134	0.146	0.069	0.004	
Proportion	0.850	0.067	0.045	0.021	0.009	0.009
Cumulative	0.850	0.917	0.962	0.982	0.992	1.000