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Constructing a corporate governance index for SMEs: How it mediates the access to finance–performance relationship

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Abstract
SMEs play a vital role in employment, innovation, and competitiveness worldwide, yet their governance structures remain underexplored in academic research. Existing studies on corporate governance predominantly focus on large publicly traded firms, leaving a gap in our understanding of how governance mechanisms operate in SMEs. To fill this gap, the primary purpose of this study is to introduce a novel and comprehensive corporate governance index tailored specifically to SMEs. Using stratified sampling, we conducted a structured survey of 469 SMEs across diverse sectors and firm sizes in Türkiye. This index comprises six subdimensions: board structure, family involvement, female participation, digitalization, corporate accountability, and succession, and its internal validity is confirmed with Cronbach's alpha values above 0.70 for the overall index and most subindices. The second purpose of this study is to investigate the relationship between access to finance and SME performance, emphasizing the mediating role of corporate governance. Using cross-sectional regression analysis, our results show that access to finance significantly improves SME performance. We also find that corporate governance not only enhances performance directly but also mediates this positive association. To the best of our knowledge, this is the first study to demonstrate that access to finance influences SME performance through both direct and indirect channels. Overall, our findings highlight that effective governance structures are essential to maximize the benefits of access to finance. This finding underscores the role of institutional and managerial factors in enhancing firm-level competitiveness by enabling SMEs to leverage access to finance and governance practices to achieve sustainable growth.

Keywords: *Emerging markets, SME performance, access to finance, corporate governance*

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1. INTRODUCTION

Small and Medium Enterprises (SMEs) play a vital role in both developed and emerging economies, making substantial contributions to added value and employment. OECD highlights that SMEs account for over sixty-nine percent of total employment, fifty-nine percent of turnover, and forty-five percent of exports in twenty-six OECD countries (OECD, 2024a). According to World Bank (2024) statistics, SMEs make up the majority of enterprises globally and play a significant role in creating jobs and expanding the international economy, representing 90% of enterprises and more than 50% of employment worldwide. Moreover, SMEs make up 40% of the gross domestic product (GDP) in emerging economies, highlighting the significance of SMEs as current and future catalysts

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for economic growth and development.

Although SMEs are the main engine of economic growth, the persistence of financial constraints as a critical barrier to their performance is well documented, both in earlier seminal contributions (Beck et al., 2005b; 2006; Aterido et al., 2011; Wang, 2016) and in more recent studies (Lewandowska et al., 2021; Nicolas, 2022; Bertoni et al., 2023; Bhattacharyya et al., 2023). SMEs still rely predominantly on bank-based finance and face limited access to equity and other market-based instruments (Degryse et al., 2018; Ferrando et al., 2017; Sommer, 2024). Information asymmetries and limited transparency often lead banks to perceive SMEs as riskier borrowers than larger firms (Ndiaye et al., 2018; Motta, 2020). Consequently, SMEs face disproportionately high financing costs, including higher fees, collateral requirements, and non-price terms (Berger & Udell, 2006; Beck et al., 2008). Further evidence suggests that SMEs' access to finance often depends on the strength of their banking relationships, leaving those without established ties particularly vulnerable to credit constraints (Berger & Udell, 2006; Beck et al., 2008; Wang et al., 2020).

A significant element positively associated with financial performance and access to finance is corporate governance, which ensures accountability and transparency in business operations. Policy analyses consistently show that stronger governance structures, such as clearer ownership arrangements, effective board oversight, and robust disclosure practices, help mitigate information asymmetries and strengthen creditors' confidence, thereby facilitating access to bank credit and other funding sources (World Bank, 2024; OECD, 2024b). Recent cross-country and sectoral studies further demonstrate that governance mechanisms are positively associated with firm outcomes in both advanced and emerging economies, with particularly strong effects for SMEs that typically suffer from opacity and concentrated ownership (see Li et al., 2020; Handley & Molloy, 2022; Teixeira & Carvalho, 2024). Given SMEs' high ownership concentration and family involvement in strategic decision-making, SME-specific governance frameworks, rather than scaled-down versions of those designed for listed firms, are required to capture SMEs' unique managerial and structural characteristics. These observations highlight the need for a framework that explicitly links SME governance with access to finance and firm performance.

Accordingly, this study pursues a dual but integrated purpose. Its primary aim is to introduce and validate a novel Small and Medium-sized Enterprises Corporate Governance Index (SCGI) as a governance measure tailored to SMEs. Building on this, the study also pursues a second aim: to investigate how access to finance affects SME performance and whether this relationship is mediated by governance. By addressing these two aims, the paper contributes to a better understanding of how governance structures shape SMEs' access to finance and performance link. To serve this purpose, developing the index and empirically testing its role within a mediation framework are essential.

The motivation for the first objective stems from a significant gap in the literature. Despite the growing recognition of governance as a determinant of SMEs' performance, the literature still lacks a dedicated theoretical foundation or comprehensive framework for conceptualizing SME governance. As Handley and Molloy (2022) emphasize, the SME governance literature remains fragmented and overly narrow, lacking a suitable model that reflects SMEs' unique ownership patterns and organizational dynamics. Building on this need for SME-specific governance frameworks, the primary objective of this article is to design and operationalize a novel and comprehensive framework. Consequently, this study develops a transparent index (SCGI) and examines whether governance practices relate to SME performance. SCGI provides a systematic tool to assess the relative level of corporate governance in SMEs, addressing both conceptual and empirical gaps.

The second objective of this study is to explore how corporate governance mediates the relationship between access to finance and SME performance, by employing the SCGI as a novel governance measure. Using the SCGI, we systematically capture SMEs' governance quality and examine both the direct and indirect mechanisms linking access-to-finance to performance. Our

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analysis proceeds in two steps. First, we assess the direct association and confirm that easier access to finance significantly enhances SME performance, consistent with earlier seminal evidence (Beck et al., 2005b; Fowowe, 2017; Motta, 2020). Second, we test the mediating mechanism and provide novel evidence that stronger governance practices partially transmit this effect, amplifying the benefits of financial access. This aligns with recent evidence from an emerging market, highlighting governance as a mediator and moderator in the finance–performance nexus (Tetteh et al., 2022). Overall, our contribution extends prior studies by moving beyond a simple finance–performance nexus and documenting the mediating role of governance. Our findings are robust to different variable definitions, measurements, samples, and methodologies.

Türkiye provides a particularly relevant context for examining the relationship among corporate governance, access to finance, and SME performance. As one of the twenty largest economies in the world and a current member of the G20, Türkiye occupies a strategic position at the crossroads of Europe and Asia, functioning as a bridge between advanced and developing markets. There are 3.57 million SMEs in Türkiye, representing 99.7% of all enterprises. SMEs account for 71% of total employment, 48.3% of total personnel costs, 44% of turnover, 37.3% of total production value, and 35.5% of value added at factor costs, making SMEs central drivers of national growth. (TUIK, 2022). At the same time, the structural challenges Turkish SMEs face, limited access to finance, evolving governance frameworks, and institutional frictions, are also characteristic of many other emerging markets. This makes Türkiye an especially relevant setting, comparable to other emerging economies where SMEs dominate. For this reason, the mechanisms identified in the Turkish context are highly relevant beyond national borders. In this broader context, access to finance and strong firm performance are critical drivers of competitiveness, enabling SMEs to invest in efficiency, resilience, innovation capacity, and integration into global value chains (OECD, 2024b). In this way, governance-driven improvements at the firm level can scale up to industry and country levels, reinforcing productivity and supporting global competitiveness.

Our paper contributes to the literature in several ways. Given SMEs' unique structural and managerial characteristics, including high ownership concentration, family involvement, and resource constraints, a dedicated governance index is necessary to capture their distinct governance dynamics and link them meaningfully to performance and access to finance. Handley and Molloy (2022) highlight this gap in conceptual clarity for SMEs, but their argument alone provides insufficient empirical grounding for index development. We design the SCGI to address this gap. This comprehensive framework simultaneously captures six dimensions of SME governance: board, family involvement, female participation, digitalization, corporate accountability, and succession. The construction of SCGI relies on a multi-source approach: (i) a large-scale review of recent governance and SME finance literature, (ii) preliminary open-ended interviews with SME owners and executives, (iii) expert insights from bank officials and certified public accountants, and (iv) enterprise indicators drawn from the World Bank Enterprise Surveys (2017) covering gender, workforce, innovation, technology, and firm characteristics. By integrating multiple perspectives, SCGI not only addresses existing gaps in SME governance measurement but also provides a robust, holistic, and empirically grounded tool for linking governance quality to SME performance and financial access.

Our second contribution is to provide robust empirical evidence on the mediating role of corporate governance, a factor often overlooked in studies examining the relationship between access to finance and SME performance. Using the SCGI, we show that enhanced access to finance positively influences governance practices, ultimately improving firm performance. In this way, corporate governance acts as a mechanism that partially transmits the benefits of financial access, offering novel insights into the underlying processes linking finance and performance. Additionally, we document a direct and significant relationship between access to finance and SME performance, using objective and subjective financial access measures. Focusing on SMEs in Türkiye, an emerging

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market, allows us to provide context-specific evidence while contributing to a broader understanding of governance-mediated finance–performance dynamics in similarly structured economies.

Overall, this study's emphasis on the mediating role of corporate governance contributes to the broader discourse on business sustainability, efficiency, and, consequently, competitiveness. By constructing a corporate governance index and examining the interplay between access to finance, corporate governance, and SME performance, we provide novel insights into the mechanisms that drive firm competitiveness. Competitiveness is a multidimensional concept encompassing firm efficiency, productivity, and long-term sustainability, all influenced by access to finance and corporate governance. Access to finance is a critical factor in enhancing firm competitiveness, as it enables SMEs to invest in innovation, technology, and expansion, thereby improving productivity and market positioning. Furthermore, corporate governance plays a vital role in shaping a firm's strategic decision-making, risk management, and operational efficiency—key components of competitiveness. Our findings suggest that effective governance structures are necessary to maximize the benefits of access to finance, underscoring the importance of institutional and managerial factors in driving firm-level competitiveness.

This paper proceeds as follows. The second section presents the theoretical background and literature review. We provide our sample, variables, and models in Sections 3 and 4. Sections five and six discuss our findings and present the robustness tests. Section seven concludes the paper.

2. THEORETICAL BACKGROUND, LITERATURE REVIEW, AND HYPOTHESIS DEVELOPMENT

SMEs' greater difficulty accessing finance is consistent with theoretical models considering market frictions that may hinder firm growth (Beck et al., 2005a). Assuming fixed transaction costs and considering information asymmetries, SMEs are theoretically expected to face higher transaction costs and higher risk premiums due to their less transparent structure and limited collateral offerings (Motta, 2020). In line with this, the financial growth cycle theory predicts that smaller and younger firms have more difficulty accessing finance due to less information transparency (Mac an Bhaird & Lucey, 2011). Recent empirical studies support this theory, demonstrating that firm size, age, and information transparency significantly influence financing options for SMEs (Vega-Pascual et al., 2025). Our study blends these theoretical arguments with essential corporate governance theories such as stewardship, resource-based, and agency theories, reflecting the increasing recognition that combining multiple theoretical perspectives is essential for producing nuanced and logically consistent insights into firms' governance practices (Zaman et al., 2022). Combining various theoretical perspectives is even more important when examining a complex structure such as the corporate governance of SMEs, for which there is no coherent theoretical framework (Tetteh et al., 2022).

According to stewardship theory, managers are not opportunistic shirkers but trustworthy stewards who aim to do a good job and are intrinsically motivated to focus on the collective good of the organization (Donaldson & Davis, 1991). This perspective is relevant for SMEs, where ownership and management are often intertwined through family ties, thereby strengthening loyalty and long-term commitment to the firm's success (Gnan et al., 2015; Chrisman, 2019). On the other hand, the resource-dependency theory assumes that the primary function of corporate governance is to provide the organization with resources such as legitimacy, advice and counsel, and links with other organizations (Hillman & Dalziel, 2003). This view is also especially pertinent to SMEs, which rely heavily on boards and external networks for strategic advice, market connections, and access to finance due to their limited internal resources (Filatotchev et al., 2006; Muhammad et al., 2024). Together, these theories highlight that corporate governance in SMEs often extends beyond control

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functions, playing a broader role in ensuring resource acquisition, strategic guidance, and collective value creation.

However, it would be a limited perspective to assume that no control and monitoring functions are needed in SMEs. For example, SMEs may struggle with the entrenchment effect, which occurs when managers acquire power due to their family status rather than their merits (Roffia et al., 2022). Hence, our study also refers to agency theory to address the entrenchment effect and other agency-type conflicts specific to SMEs.

2.1. Access to finance and firm performance

As a first step, we consider the relationship between access to finance and firm performance. Like other organizations, SMEs require financial resources to sustain and expand their businesses (Abor & Adjasi, 2007). SMEs with access to finance can improve employee satisfaction by increasing employees' salaries and conducting their investments as planned and on time (Steinerowska-Streb & Steiner, 2014). Access to finance is expected to allow SMEs to invest in innovation, manufacturing processes, products, employee growth, and welfare (Kijkasiwat & Phuensane, 2020). However, SMEs tend to be credit-constrained due to information asymmetry and fixed transaction costs, which prevent them from being involved in productive investments and consequently limit their growth and performance (Dinh et al., 2012). Firms without access to finance may lay off employees to reduce their overall costs. Moreover, these companies may lower prices to attract customers and enhance their market share or suspend their planned investments, which might endanger firm performance (Steinerowska-Streb & Steiner, 2014).

In short, SMEs are likely to encounter difficulties and constraints in finding access to finance, which creates a significant obstacle to their growth (Bertoni et al., 2023; Bhattacharyya et al., 2023; Boccaletti et al., 2025; Brixiová et al., 2020; Fowowe, 2017; Nicolas, 2022; Wang, 2016). Accordingly, because financing constraints create a major obstacle to SME growth, we predict that access to finance will be positively associated with performance, leading to our first hypothesis:

H1: Access to Finance (AtoF) is positively associated with SMEs' performance.

2.2. Corporate governance and firm performance

We next examine the direct role of corporate governance in shaping SME performance. The governance theories suggest that corporate governance is positively associated with financial performance as it promotes stewardship behavior (Donaldson & Davis, 1991), facilitates resource allocation (Hillman & Dalziel, 2003), and reduces agency conflicts (Jensen & Meckling, 1976). However, the relationship between individual governance elements and performance is empirically inconclusive (see Arora & Sharma, 2016). A growing body of literature has recently started incorporating various components rather than focusing on individual governance mechanisms in isolation. Love (2011) states that studies recognizing the holistic nature of corporate governance find a positive association between corporate governance and performance. Notable studies contributing to this body of evidence include Klapper and Love (2004), Balasubramanian et al. (2010), Black et al. (2006), Ararat et al. (2017), and Bhatt and Bhatt (2017), Arora and Bodhanwala (2018). However, these studies primarily focus on large publicly traded companies.

Studies on SMEs often narrowly examine the relationship between performance and individual governance mechanisms. For instance, Abor and Biekpe (2007) study SMEs in Ghana, demonstrating that financial performance positively correlates with board size and composition, management skills, and CEO duality. Muhammad et al. (2024) find a positive link between governance and performance among European SMEs, particularly when technological capability is strong. Singh and Rastogi (2023) provide evidence from listed SMEs in India that ownership structure and disclosure practices are relevant determinants of financial performance. Roffia et al. (2022) report

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that firm performance is positively associated with specific board attributes, such as frequent risk analysis and management meetings, but negatively related to others. The mixed associations between governance elements and SME performance underscore the nuanced nature of their relationship, emphasizing the importance of a comprehensive conceptualization of SME-specific governance mechanisms. Recently, Nasrallah and El Khoury (2022) use a corporate governance index for SMEs, finding a positive link between corporate governance and performance, reinforcing the idea that holistic governance practices enhance SME performance. Overall, the evidence suggests that a comprehensive and SME-specific governance framework is positively associated with performance. Accordingly, we hypothesize:

H2: Corporate governance (SCGI) is positively associated with the financial performance of SMEs.

2.3. Corporate Governance: mediating role between access to finance and firm performance

Finally, we integrate these perspectives to argue that governance mediates the finance–performance relationship. While the positive influence of corporate governance on access to finance is often emphasized (Abor & Adjasi, 2007; Chen et al., 2010), the relationship between access to finance, corporate governance, and firm performance in the context of SMEs is complex and multifaceted. Understanding the role of corporate governance in this relationship is crucial for understanding the mechanisms through which access to finance translates into enhanced SME performance.

As Roffia et al. (2022) note, most governance practices are too expensive for SMEs as they typically operate with limited financial resources. It is a great challenge for SMEs to balance the costs and benefits of implementing robust governance practices. Adequate access to finance enables SMEs to invest in the necessary mechanisms and resources to enhance their corporate governance practices. This provides a distinct channel through which the positive relationship between access to finance and firm performance can manifest. Corporate governance tends to mediate between access to finance and performance, as the cost of corporate governance, referring to the financial implications of implementing governance mechanisms, depends on access to finance. Hence, we anticipate that the positive effect of access to finance on firm performance may not occur in isolation but could be influenced by corporate governance, as adherence to governance can enhance the ability of firms to utilize financial resources more effectively (Shleifer & Vishny, 1997).

On the other hand, some studies show that access to finance also plays a significant role in determining the necessity of corporate governance for SMEs. For example, Filatotchev et al. (2006) emphasize how governance parameters evolve as a firm progresses through different stages of its life cycle. In their early life stages, such as small family businesses, firms have a narrow resource base and high ownership concentration. However, SMEs, which fuel their growth through external finance, apply tighter governance mechanisms to ensure greater transparency and accountability to the lenders. This shift in corporate governance practices reflects a recognition of the need for effective governance in managing the increased complexity of accessing external finance. Furthermore, Tetteh et al. (2022) emphasize the mediating role of corporate governance in the positive relationship between financing decisions and performance, suggesting that effective governance is contingent upon the complexity of funding mechanisms.

Even though we anticipate access to finance to provide SMEs with the necessary capital to invest in operations, technology, innovation, and market expansion, having access to financial resources may not guarantee improved SME performance. How these resources are managed and deployed is crucial in determining their ultimate impact on performance. Stronger governance is expected to mitigate risks (Ballester et al., 2020), align managerial actions with the long-term interests

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of stakeholders (Shleifer & Vishny, 1997), and foster an environment where financial resources contribute to sustainable growth. With improved governance, firms are likely to have greater trust in financial reporting, leading to lower cost of debt, improved investment efficiency (Le and Tran, 2022), and reduced potential risks associated with financial mismanagement (Ballester et al., 2020). In summary, while access to finance provides the necessary capital, effective governance ensures that these resources are deployed to maximize their impact on performance. We therefore hypothesize:

H3: Corporate governance (SCGI) mediates the relationship between access to finance and SMEs' performance.

3. DATA AND VARIABLES

This study relies on hand-collected primary data obtained through an extensive survey conducted in 2021. The survey is designed to gather detailed information on corporate governance practices, access to finance, and firm performance from a sample of 469 SMEs in Türkiye. Türkiye represents a particularly relevant and insightful context for examining the relationship between access to finance, governance, and performance in SMEs. As a member of the G20, it is recognized for its systemic importance in the global economic architecture (World Bank, 2025). Türkiye also represents a substantial market with strong regional linkages, ranked among the world's largest economies in nominal GDP (IMF, 2025). Its strategic location at the crossroads of Europe and Asia enhances its role as a gateway between advanced and developing markets. Importantly, SMEs account for over 99% of all firms in Türkiye and play a vital role in employment, exports, and innovation (OECD, 2022). This combination of global economic significance, regional importance, and SME intensity makes Türkiye not only an essential case in its own right but also a representative context for other emerging markets, thereby increasing the broader relevance of the study's findings.

To ensure the reliability of the information collected, the survey targeted senior management representatives, such as general managers or authorized senior managers, given their familiarity with the firms' financial and governance details. The survey was conducted by a professional survey company using face-to-face interviews, which helps to improve the response rate and minimize biases. The survey is composed of 74 questions in four sections, which are (1) general characteristics of the SME, (2) sales and supply, (3) corporate governance, and (4) access to finance. These sections allow us to capture the necessary variables for constructing the novel SCGI and to investigate the relationships between access to finance, corporate governance, and SME performance. In this way, the survey data serve a dual function: they allow us to construct the SCGI and its empirical use in testing the mediating role of governance in the finance–performance relationship within a consistent dataset.

According to the Turkish Statistical Institute, there are 3.22 million SMEs in Türkiye as of 2019. To determine the sample size, we use Cochran's (1963) formula ($n_0 = \frac{Z^2 pq}{e^2}$), which is employed to determine the appropriate sample size for large populations (Israel, 1992). In this formula, n_0 is the sample size, Z is the z value for the desired confidence level, e is the desired level of precision, and p is the estimated proportion of an attribute present in the population. p-value is 50% because it leads to variance maximization and maximum sample size (Bartlett et al., 2001). We increase this sample size by more than 10% to avoid the possibility of incomplete or inaccurate surveys, ensuring that we study at a 95% confidence level with a less than ±5% margin error (Israel, 1992). Our final sample size is 469 SMEs. We first run a pilot study with 43 SMEs to reduce unexpected problems during the main data collection process. To ensure that the sample fairly represents the population, we employ stratified sampling by city, industry, and size. Considering their

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proportions in the population, our sample includes SMEs from ten main cities and five main sectors where SMEs are predominantly operating. Likewise, micro, small, and medium-sized SMEs are included in the sample by considering their respective percentages in the population. Table 1 shows the sector and size distribution of our sample.

Tab. 1 - SME distribution by industry and size*
Source: own research

	Size			
Industry	Micro	Small	Medium	Total
Manufacturing	6 (1.28%)	22 (4.69%)	50 (10.66%)	78 (16.63%)
Wholesale and Retail Trade**	65 (13.86%)	88 (18.76%)	55 (11.73%)	208 (44.35%)
Construction	4 (0.85%)	11 (2.35%)	32 (6.82%)	47 (10.02%)
Transportation and Storage	12 (2.56%)	20 (4.26%)	56 (11.94%)	88 (18.76%)
Tourism***	4 (0.85%)	20 (4.26%)	24 (5.12%)	48 (10.23%)
Total	91 (19.40%)	161 (34.33%)	217 (46.27%)	469 (100.00%)

*This table shows the distribution of SMEs in the sample by size and industry. Five main sectors in which SMEs operate intensively are included in the sample. Percentages are provided in parentheses.
**Also includes "Repair of Motor Vehicles and Motor Land Vehicles"
*** Includes accommodation and Food Service Operations

3.1 Construction of SMEs' Corporate Governance Index (SCGI)

The primary focus of this study is the development of SCGI, a novel index specifically designed to measure governance practices in SMEs. Our starting point in developing SCGI is the governance indicators offered for SMEs in different countries, such as the United Kingdom (Al-Najjar, 2015), Ghana (Abor & Biekpe, 2007), Italy (Gnan et al., 2015), and Lebanon (Nasrallah & El Khoury, 2022). For example, Abor & Biekpe (2007) examine discrete SME mechanisms, board size, board composition and control, managerial skill, CEO duality, and ownership structure (inside/family/foreign), and link them to the performance of SMEs in Ghana; however, they do not deliver a composite, replicable index. Al-Najjar (2015), on the other hand, constructs a concise 0–10 SME governance score for UK SMEs based on observable board and audit features and the presence/independence of committees. However, despite being practical and transparent, this construct is deliberately narrow in scope. Gnan et al. (2015) widen the lens in family SMEs by showing that family councils often partially substitute for formal corporate mechanisms (shareholders' meeting, board, CEO), highlighting governance forms unique to SMEs but without proposing a transferable index. More recently, Nasrallah & El Khoury (2022) propose a questionnaire-based SME governance score using a bundles approach (board efficiency; credibility

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of accounting/internal control/external audit; sound operations) and evaluate its relationship with firm performance using endogeneity-aware estimation.

While prior SME-oriented governance indices are the starting point for the construction of SCGI, we extend beyond the candidate items in those studies by drawing on a comprehensive, systematic review of the literature on SME structures and management. Rather than back-fitting codes developed for listed firms, the SCGI is co-designed with SMEs. Following Krueger (2014), we use three additional methods to identify governance elements specific to SMEs: (i) a focus group with three SME CEOs and three academics; (ii) preliminary open-ended interviews with SME owners and top managers; and (iii) expert consultations with a bank manager and a certified public accountant. On this basis, we assemble a set of governance items directly relevant to SMEs. In sum, the SCGI preserves transparency and parsimony while capturing SME-specific routines that prior work does not capture or address only indirectly.

Following this methodology, SCGI consists of six sub-indices and 27 items in total. All items are coded as binary indicators (1 if the feature is present, 0 otherwise) and are equally weighted within their respective sub-indices and in the overall index. This equal weighting approach, consistent with prior governance index studies (e.g., Ararat et al., 2017; Nasrallah & El Khoury, 2022), avoids introducing subjective bias into the aggregation process and ensures transparency in the construction of the index.

The inclusion of the six sub-indices is further supported by theoretical considerations. Stewardship theory emphasizes trust and long-term orientation, supporting items on family involvement and succession. Resource-dependency theory highlights the role of governance in securing critical resources and legitimacy, which underpins elements such as female participation, digitalization, and corporate accountability. Finally, agency theory explains the importance of monitoring and control mechanisms, providing a rationale for board structure, independence, and authority division items. By drawing on these complementary perspectives, the SCGI captures governance practices that reflect the unique realities of SMEs. Further details on sub-indices and items are as follows:

Tab. 2 – SCGI: Description of sub-indices of SCGI and summary statistics
Source: own research

		Obs.	Frequency D:0	Frequency D:1	Mean	Std.dev.	Min	Max
1. Board								
BOD	SME has a "Board of Directors"	469	295	174	0.37	0.48	0	1
BOD Size	BOD size is larger than the median of sample (median = 4)	465	379	86	0.18	0.39	0	1
Annual Board Meeting	Number of board meetings in a year is higher than 3	457	364	93	0.20	0.40	0	1
CEO Chairman Duality	CEO and the board chairman are different individuals	469	429	40	0.09	0.28	0	1
Non-family Board Chairman	The board chairman is independent from the owner family	451	340	111	0.25	0.43	0	1
Independent Board Member	There is at least one independent board member	464	395	69	0.15	0.36	0	1
Non-family Board Members	There is at least one board member outside the owner family	458	315	143	0.31	0.46	0	1
	Normalized Board structure subindex	**469**			**0.00**	**1.00**	**-0.70**	**2.70**
	Scaled subindex (0–100)	**469**			**21.81**	**29.86**	**0.00**	**85.71**
	Cronbach's alpha	**0.87**						
	Mean inter-item correlation (r)	**0.49**						
2. Family Involvement								
Family Firm	SME is a family business	469	277	192	0.41	0.49	0	1
Family Council Meetings	There are regular family council meetings about	464	409	55	0.12	0.32	0	1

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	firm operations							
Family Generation in Management	Board members from family are the second or further family generations.	469	402	67	0.14	0.35	0	1
	Normalized Family subindex	**469**			**0.00**	**1.00**	**-0.71**	**2.45**
	Scaled subindex (0–100)	**469**			**22.32**	**31.64**	**0.00**	**100.00**
	Cronbach's alpha	**0.75**						
	Mean inter-item correlation (r)	**0.50**						
3. Female Participation								
Female Board Member	There is at least one female board member in SMEs	469	382	87	0.19	0.39	0	1
Generation of Family Female Board Member	Female board members from family are the second or further family generations.	454	438	16	0.04	0.18	0	1
Female CEO	CEO is female	466	410	56	0.12	0.33	0	1
Female Ownership	There are female shareholders in SMEs	468	379	89	0.19	0.39	0	1
	Normalized Women subindex	**469**			**0.00**	**1.00**	**-0.55**	**3.63**
	Scaled subindex (0–100)	**469**			**13.22**	**23.88**	**0.00**	**100.00**
	Cronbach's alpha	**0.71**						
	Mean inter-item correlation (r)	**0.38**						
4. Digitalization								
Corporate Website	SME has a functioning corporate website	469	87	382	0.81	0.39	0	1
E-commerce	SME engages in e-commerce	467	251	216	0.46	0.50	0	1
Internet Banking	SME uses internet banking in business operations	469	53	416	0.89	0.32	0	1
	Normalized Digitalization subindex	**469**			**0.00**	**1.00**	**-2.45**	**0.95**
	Scaled subindex (0–100)	**469**			**72.07**	**29.38**	**0.00**	**100.00**
	Cronbach's alpha	**0.54**						
	Mean inter-item correlation (r)	**0.28**						
5. Corporate Accountability								
External Audit	Financial statements of SMEs are controlled through an external audit	462	311	151	0.33	0.47	0	1
Internal Audit	There is internal audit function in SMEs	466	253	213	0.46	0.50	0	1
Financial Consultancy	SME receives financial consultancy services	468	254	214	0.46	0.50	0	1
Legal Consultancy	SME receives legal consultancy services	466	195	271	0.58	0.49	0	1
Separate Finance Department	There is a separate finance department in SMEs	465	257	208	0.45	0.50	0	1
Certified Public Accountant	SME employs a certified public accountant	466	277	189	0.41	0.49	0	1
	Normalized Expert subindex	**469**			**0.00**	**1.00**	**-1.34**	**1.68**
	Scaled subindex (0–100)	**469**			**44.28**	**33.15**	**0.00**	**100.00**
	Cronbach's alpha	**0.76**						
	Mean inter-item correlation (r)	**0.35**						
6. Succession								
Board Members' Induction	There is an induction or orientation program for the new board members	466	357	109	0.23	0.42	0	1
Succession Plan	There is a succession plan for a possible CEO change	466	362	104	0.22	0.42	0	1
Formal Training for Employees	There are vocational or corporate training programs in SME for current employees	463	286	177	0.38	0.49	0	1
Orientation of New Employees	There is an orientation program in SME for new employees	468	222	246	0.53	0.50	0	1
	Normalized Training subindex	**469**			**0.00**	**1.00**	**-0.98**	**1.91**
	Scaled subindex (0–100)	**469**			**33.90**	**34.58**	**0.00**	**100.00**
	Cronbach's alpha	**0.76**						
	Mean inter-item correlation (r)	**0.44**						
Normalized SGCI		**469**			**0.00**	**1.00**	**-1.74**	**3.16**
Non-normalized SGCI		**469**			**34.60**	**19.78**	**0.00**	**94.84**
Cronbach's alpha		**0.72**						
Mean inter-item correlation (r)		**0.30**						

This table displays the definitions and summary statistics of governance items used to construct SMEs' Corporate Governance Index (SCGI). Data is composed of hand-collected primary data collected through the survey. Frequency distribution, mean, standard deviation, minimum, and maximum values of each item are presented. The normalized sub-index corresponds to the standardized version of the index with mean=0, standard deviation=1, and the scaled sub-index corresponds to the rescaled version of the index between 0 and 100.

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- ***Board***: The board of directors (BOD, hereby) is deemed the most vital element of corporate governance. Actively operating boards in SMEs make the decision-making process more rigorous and inclusive (Abor & Biekpe, 2007) and play a significant role in strategy development (Fiegener, 2005). Recent studies show that SME boards foster growth by facilitating learning and linking owners with management (Liljeström et al., 2025), while their design also shapes how effectively firms respond to crises (Fasth et al., 2025). Thus, the main focus is whether the BOD is present or not. SMEs without a BOD will score zero from the Board sub-index as they cannot benefit from any of the potential governance merits provided by the BOD. The second item is related to board size. Although there are two conflicting views, one claiming that large BOD improves governance practices by increasing collaborative work (Dalton et al., 1999) or advisory control (Coles et al., 2008), and the other that it worsens governance practices by making BOD operations less efficient (Jensen, 1993), research favors the former in the context of SMEs. Larger boards in SMEs tend to have a range of expertise to guide decision-making (Abor & Biekpe, 2007). They are crucial in advancing corporate governance and growth (Barroso-Castro et al., 2022). The third item is the number of board meetings, an important internal control and audit mechanism showing how active the BOD is (Al-Najjar, 2015). The next two items are related to the division of authority, which increases the monitoring and control over management, thereby improving governance (Ararat et al., 2017; Deman et al., 2018; Fama & Jensen, 1983). The fourth item is CEO duality, and the fifth item asks whether the board chair is from outside the founder's family. The final two items are about the independence of the board members, which is expected to improve corporate governance since it increases the BOD's effectiveness (Fiegener, 2005), value creation (Maseda et al., 2015), and even firm internationalization (Debellis et al., 2023).

- ***Family Involvement***: Agency theory argues that shared financial interests, trusting relationships, and strong commitment reduce agency costs in family businesses (Fama & Jensen, 1983). Mishra et al. (2001) empirically find that unique corporate governance mechanisms of family firms improve their financial performance and reduce agency costs. Family council meetings are particularly important for family SMEs, as they enhance the monitoring functions of corporate governance (Gnan et al., 2015). Besides, the second and further generations in management signal stronger governance because succeeding generations are equipped with transmitted experience and knowledge and show objective management practices (Mitter et al., 2014).

- ***Female Participation***: The presence of women in BOD improves financial performance (Salloum et al., 2019), enhances the quality of financial reporting (Oradi & Izadi, 2020), and increases voluntary disclosure levels (Liao et al., 2015). Although these effects are more pronounced when the female directors are independent (Oradi & Izadi, 2020), female directors in Turkish SMEs are mostly from the owner's family. Therefore, we include the family generation of female directors as we conjecture that the further generations may indicate greater professionalism and objectivity, thus greater independence. We also include an item asking if the CEO is a woman and an item asking if there is a female shareholder because women-led companies tend to have higher financial performance, which is also valid for SMEs (Davis et al., 2010). These last two items are extracted from the gender section of the World Bank Enterprise Surveys (2017).

- ***Digitalization***: Digitalization is likely to improve some basic corporate governance aspects, such as auditing (Manita et al., 2020), board independence (Lepore et al., 2022), and board dynamism (Bankewitz et al., 2016). Besides, the rapid adaptation to the digitalization era is seen as an indicator of good governance (Fenwick et al., 2019) and enhances governance quality by strengthening innovation and ESG performance in SMEs (Chen & Wang, 2024). Recent evidence further highlights that technological capability strengthens the positive link between corporate governance practices

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and SME performance (Muhammad et al. 2024). Based on the focus groups and the innovation and technology section of World Bank Enterprise Surveys (2017), we include three items: a corporate website, using e-commerce, and internet banking, which are considered better governance signals.

- ***Corporate Accountability***: Firms adopting more professional approaches to ensure transparency and accountability tend to have stronger corporate governance. For example, both internal and external auditing contribute to communicating better-quality accounting information to stakeholders (Manita et al., 2020), which, in turn, supports SMEs' growth, performance, and long-term survival (Carey, 2015). We also include financial and legal consultancy because acquiring external business advice significantly improves SMEs' performance (Robson & Bennett, 2000). Finally, preliminary interviews reveal that a separate financial department and a certified public accountant may imply more rigorous attempts to ensure transparency and accountability.

- ***Succession***: Board instability reduces financial performance and increases the risk (Feng & Xiao, 2022). Hence, measures taken to provide a proper and timely response to potential board changes indicate good governance. For instance, an effective board induction program maximizes the contribution of new board members as it enables the efficient transfer of intellectual capital (Nicholson & Kiel, 2004). Likewise, having a CEO succession plan is considered good governance practice (Jiang et al., 2008) because succession plans help ensure businesses' sustainability and survival. Besides, sound human resource management helps SMEs cope with change and maintain their competitive advantage (Moustaghfir et al., 2020). Therefore, we include formal training and employee orientation as good governance indicators by referring to preliminary interviews and the World Bank Enterprise Surveys (2017).

3.2 Non-governance Variables

Table 3 displays the definitions and summary statistics of non-governance variables. While the performance of publicly traded firms is usually measured by variables such as ROA and ROI, these variables may be incomplete, unreliable, or unavailable for SMEs (Chong, 2008). Hence, we measure performance by sales growth, one of the most widely used proxies for SME performance (Ndiaye et al., 2018). Sales growth is calculated as the average two-year logarithmic growth in sales to mitigate the effect of outliers (Ayyagari et al., 2011; Dinh et al., 2012; Fowowe, 2017).

Tab. 3 - Non-governance variables
Source: own research

Variable	Proxy	Definition	Type	Obs	Mean	Median	Std.dev.	Min	Max
Performance	Sales Growth	Natural log of 2-year average sales growth	Continuous	391	0.06	0.03	0.20	-0.46	0.80
Access to Finance (AtoF)	Subjective AtoF1	Does this enterprise have "access to finance" to enhance its operations and turnover and realize its investments? *Takes the value of 1 if the answer to the relevant question is yes, 0 if the answer is no.*	Binary	450	0.74	1.00	0.44	0.00	1.00
	Subjective AtoF2	To what degree is Access to Finance an obstacle to the current operations of this enterprise?	Ordinal	465	2.64	3.00	0.97	0.00	4.00

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		Takes ordinal values from 0 to 4 based on the answer to the relevant question.							
	Credit limit	1 if SME has a line of credit, 0 if it does not	Binary	433	0.72	1.00	0.45	0.00	1.00
	Saving account	1 if SME has a saving account, 0 if it does not	Binary	435	0.73	1.00	0.44	0.00	1.00
Control variables	Size	Natural log of total number of employees	Continuous	468	3.43	3.69	1.06	1.10	5.42
	Age	Natural log of (1 + number of years since the start of operations)	Continuous	469	2.63	2.64	0.58	0.69	3.74
	Export	1 if the firm exports and, 0 if it does not	Binary	469	0.50	0.00	0.50	0.00	1.00
	Legal	Legal status dummies for single proprietorship, limited partnership, corporation	Categorical						
	Industry	Industry dummies for each five main industries****	Categorical						

This table shows definitions and summary statistics for non-governance variables. Industry dummies are used for the five main industries included in the sample: (i) manufacturing, (ii) wholesale and retail trade; repair of motor vehicles and motor land vehicles, (iii) construction, (iv) agriculture, forestry, and fishery, (v) transportation and storage, (vi) tourism - accommodation and food service operations.

We use two subjective and two objective measures to measure access to finance. The first subjective measure of access to finance is a binary variable, taking the value of 1 if the firm thinks it has access to finance to expand its operations and turnover and realize its investments, and 0 if it does not. The second subjective measure is an ordinal variable taking values from 0 to 4 depending on whether the firm sees access to finance as a very serious obstacle (0), major obstacle (1), medium obstacle (2), minor obstacle (3), or no obstacle (4). Our first objective measure is credit limit, which takes the value of 1 if a firm has a line of credit and zero if it does not. The second objective measure takes the value of one if the firm has a savings account and zero otherwise.

We use a set of firm-specific control variables, potentially related to firm performance. For example, firm growth is typically associated with size and age (Ozar et al., 2008). Besides, firms having less difficulty in accessing finance are found to be usually larger and older (Beck et al., 2006; Dong & Men, 2014). Our size measure is ln(total employees), following Ayyagari et al. (2011). Age is measured by natural logarithms of ln(1 + number of years since the start of operations), similar to Ararat et al. (2017). To control the impact of foreign market access, we add an export dummy that takes a value of 1 if the firm exports and zero if it does not. Another control variable is legal status. Being registered as a sole proprietorship, limited partnership, or corporation can impact the growth of SMEs because entrepreneurs with limited liability may be involved in riskier projects with the anticipation of higher profits (Ozar et al., 2008). Finally, we include industry dummies to capture the possible impact of sectors on SME performance.

3.3. Model specification

Our model's dependent and independent variables are performance and access to finance (AtoF), and the mediator variable is the corporate governance index (SCGI). Figure 1 illustrates the model to be tested. The total impact of AtoF on performance (patch c) can be divided into two

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components: direct effect and indirect effect. The indirect effect is the part reaching the dependent variable through the mediator variable SCGI, which is measured by (a x b). The remaining effect is called the direct effect and is usually demonstrated by c'. As long as the sample is the same for all three models, the total effect equals the sum of the direct and indirect effects, c = (a x b) + c'.

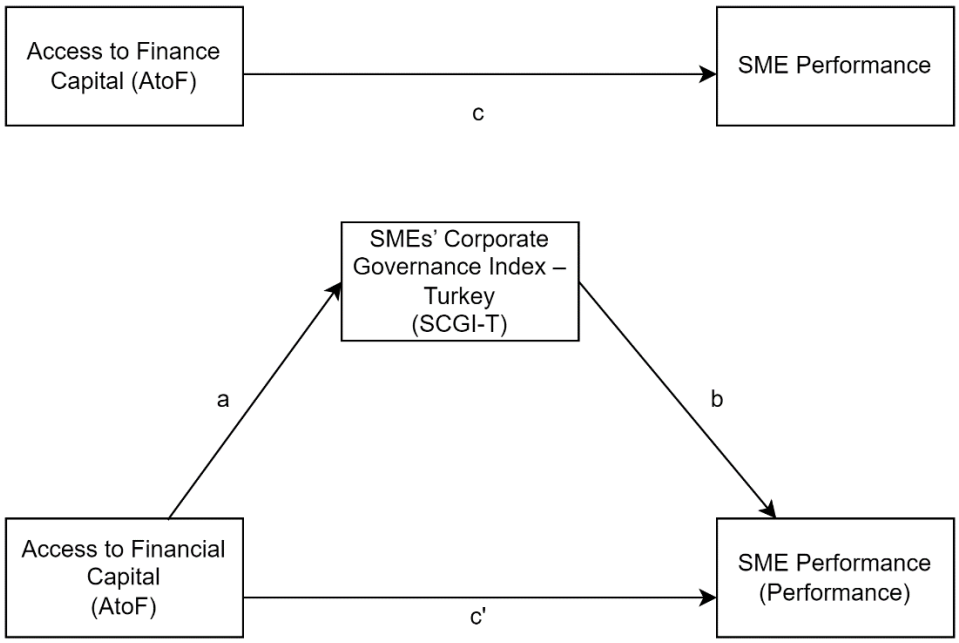

Fig. 1 - The relationship between SCGI, SME performance, and Access to Financial Capital
Source: own research

Baron and Kenny (1986) state that empirical testing of the mediation effect requires testing a three-stage regression model. The first equation regresses the performance on the independent variable along with the control variables. Since the mediating variable (SCGI) is not included, the coefficient on AtoF gives the overall impact of access to finance on performance, represented by path c in Figure 1. The second equation regresses the mediating variable (SCGI) on the independent variable (AtoF) and control variables. The coefficient on the independent variable measures the effect of AtoF on SCGI, which corresponds to "path a" in Figure 1. Finally, the third equation regresses performance on the independent variable (AtoF), mediating variable (SCGI), and control variables. The coefficient on the SCGI is path b. In contrast, the coefficient on AtoF is the direct effect c', the remaining impact of access to finance on performance after accounting for the mediating variable. Based on the above, we employ the following specifications:

$$Perf_i = \alpha + \beta_1 AtoF_i + \beta_2 Size_i + \beta_3 Age_i + \beta_4 Export_i + \beta_5 Legal_i + \beta_6 Industry_i + \varepsilon_i \quad (1)$$

$$SCGI\_T_i = \alpha + \beta_1 AtoF_i + \beta_2 Size_i + \beta_3 Age_i + \beta_4 Export_i + \beta_5 Legal_i + \beta_6 Industry_i + \varepsilon_i \quad (2)$$

$$Perf_i = \alpha + \beta_1 SCGI\_T_i + \beta_2 AtoF_i + \beta_3 Size_i + \beta_4 Age_i + \beta_5 Export_i + \beta_6 Legal_i + \beta_7 Industry_i + \varepsilon_i \quad (3)$$

According to Baron and Kenny (1986), a variable qualifies as a mediator if: (i) the

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independent variable significantly affects the dependent variable in the first equation, (ii) the independent variable significantly affects the mediating variable in the second equation, (iii) the mediating variable significantly affect the dependent variable in the third equation, (iv) the inclusion of the mediator leads to a reduction in the effect of the independent variable on the dependent variable. Recently, Zhao et al. (2010) argue that the only condition for establishing mediation is to find a significant indirect effect (a x b). On the other hand, the Sobel test and its versions (Aroian and Goodman tests), which are typically used for testing the indirect effect, are found to be underpowered tests of mediation due to their strict normality assumptions. The bootstrapping method, popularized by Preacher and Hayes (2004) in the mediator context, works better. Therefore, we report both the Sobel test and its versions (Aroian and Goodman tests) and the bootstrapped confidence intervals.

4. RESULTS

4.1. Construct validity of SME corporate governance index (SCGI)

SCGI serves as the primary measure of corporate governance in this study. To evaluate the internal validity of SCGI, we employ two methods. First, we use Cronbach's alpha for each subindex and the overall index, which are presented in Table 2. We also report an inter-item correlation, r, to ensure that the high Cronbach's alpha is not mainly due to a large number of items. SCGI and all sub-indices except Digitalization have Cronbach's alpha values greater than 0.70 and inter-item correlation greater than 0.30, indicating a strong underlying consistency of core concepts. While Digitization has slightly lower alpha and r, it is expected to have lower levels of reliability in the early stages of measurement development, such as introducing a brand-new index (Larcker et al., 2007). The correlations between SCGI and the sub-indices and those between the sub-indices themselves are shown in Table 4. Except for the correlation between Board and Family, each sub-index has a positive correlation coefficient, ranging from 0.14 (Board and Digitalization) to 0.58 (Board and Succession). Each sub-index is strongly and positively correlated with SCGI, with coefficients from 0.48 to 0.78. As part of the correlation between the main index and sub-indices is due to each sub-index being a component of the main index, we also present "sub-index complement", calculated for each sub-index by subtracting itself from the SCGI (Ararat et al., 2017). All subindexes have either high correlation with their sub-index complements (e.g., Succession: 0.61) or moderate correlations (e.g., Family involvement: 0.25).

Tab. 4 - Correlation matrix
Source: own research

	Board	Female Participation	Family Involvement	Digitalization	Corporate Accountability	Succession
Board	1.00					
Female Participation	**0.43*****	1.00				
	(0.00)					
Family Involvement	0.06	**0.33*****	1.00			
	(0.18)	(0.00)				
Digitalization	**0.14*****	**0.17*****	**0.18*****	1.00		
	(0.00)	(0.00)	(0.00)			
Corporate Accountability	**0.40*****	**0.35*****	**0.15*****	**0.39*****	1.00	
	(0.00)	(0.00)	(0.00)	(0.00)		

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Succession	**0.58*****	**0.40*****	**0.17*****	**0.25*****	**0.55*****	1.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	
SCGI	**0.67*****	**0.65*****	**0.48*****	**0.55*****	**0.75*****	**0.78*****
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Subindex complement	**0.49*****	**0.51*****	**0.25*****	**0.33*****	**0.57*****	**0.61*****
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

This table contains Pearson correlation coefficients for the normalized index (SCGI), the normalized subindices, and the subindex complements. The subindex complement for each subindex is calculated as SCGI minus that subindex. p-values are in parentheses. ***, **, and * denote 1%, 5%, and 10% significance levels, respectively.

To ensure the construct validity of our governance index, we also employ principal component analysis (PCA) as our second method, following other studies (Ararat et al., 2017; Larcker et al., 2007). We retain only the variables with eigenvalues greater than 1, indicating their significant contribution to the factor structure. We then apply a VARIMAX rotation to generate orthogonal factors. Each factor is associated with elements with a factor loading of more than 0.30, which is considered acceptable. Table 5 presents the PCA results. We identify seven factors with an eigenvalue greater than 1, collectively explaining 70% of the total variance in the data. The Kaiser-Meyer-Olkin (KMO) measure, which assesses the sampling adequacy, is 0.85, indicating a meritorious level of adequacy. Most individual elements have KMO values above 0.80, further supporting the suitability of the data for the analysis. The index and all individual factors, except Factor 7, display satisfactory internal consistency, with Cronbach's alpha values of 0.70 or higher. The PCA results are generally reasonable, with no negative or cross-loadings observed. However, it is not uncommon to encounter some challenging PCA results when measuring a complex construct like corporate governance (Larcker et al., 2007). The first factor accounts for 27% of the total variance. Still, it is difficult to interpret as it loads on independent board members, external audit, board member induction, and succession plan. Conversely, the remaining factors can be easily interpreted: The second factor strongly relates to board-related elements, while the third is associated with family aspects. Factors 4, 5, 6, and 7 correspond to Corporate Accountability, Female Participation, Succession, and Digitalization sub-indexes, respectively.

Tab. 5- Principle component analysis
Source: own research

Variable	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Factor7	Unexplained	KMO
BOD	0.27	0.29	-0.04	0.01	-0.06	-0.06	0.00	0.09	0.89
BOD Size	0.10	**0.35**	-0.02	-0.13	-0.04	0.03	0.06	0.44	0.92
Annual Board Meeting	-0.07	**0.49**	0.03	0.02	0.02	0.01	0.00	0.30	0.86
CEO Chairman Duality	-0.15	**0.44**	0.13	0.03	0.05	-0.04	-0.01	0.47	0.85
Non-family Board Members	0.28	0.24	-0.15	0.01	-0.05	-0.05	-0.01	0.12	0.86
Independent Board Member	**0.47**	-0.18	0.11	-0.02	-0.08	-0.01	0.00	0.32	0.86
Non-family Board Chairman	0.27	0.20	-0.28	0.01	-0.06	-0.06	0.00	0.12	0.81
Family Firm	-0.04	-0.05	**0.41**	-0.12	-0.04	-0.04	0.25	0.39	0.71
Family Council Meetings	0.05	0.06	**0.49**	0.01	-0.05	0.02	-0.02	0.34	0.84
Family Generation in Management	0.07	-0.01	**0.50**	0.08	-0.06	-0.06	-0.07	0.36	0.79
Female Board Member	0.18	0.22	0.02	0.00	0.20	-0.02	-0.01	0.37	0.94
Generation of Family Female Board Member	0.05	0.15	**0.40**	-0.01	0.11	0.04	-0.11	0.37	0.82
Female CEO	-0.01	-0.04	-0.06	0.04	**0.68**	-0.06	-0.03	0.22	0.61
Female Ownership	-0.03	0.06	0.04	-0.05	**0.63**	0.09	0.06	0.22	0.73
Corporate Website	0.03	0.03	-0.02	0.03	-0.04	0.06	**0.57**	0.39	0.84

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E-commerce	-0.01	-0.01	-0.01	-0.04	0.05	-0.08	**0.67**	0.31	0.66
Internet Banking	-0.21	0.23	-0.02	0.20	-0.16	0.17	0.25	0.55	0.81
External Audit	**0.34**	-0.20	0.07	0.02	0.10	0.06	0.18	0.45	0.87
Internal Audit	0.07	-0.14	-0.06	**0.45**	-0.01	0.09	0.00	0.37	0.82
Financial Consultancy	0.20	-0.07	-0.05	0.27	0.13	-0.10	0.15	0.44	0.88
Legal Consultancy	-0.05	0.13	-0.03	**0.48**	-0.01	0.00	0.00	0.33	0.84
Separate Finance Department	-0.01	0.05	0.03	**0.49**	0.05	-0.05	-0.08	0.41	0.89
Certified Public Accountant	-0.02	-0.08	0.14	**0.41**	-0.05	-0.03	0.00	0.57	0.74
Board Members' Induction	**0.34**	0.10	0.06	0.01	-0.02	0.08	-0.04	0.24	0.93
Succession Plan	**0.38**	0.01	0.03	-0.02	-0.01	0.10	-0.04	0.26	0.89
Formal Training for Employees	0.02	-0.01	0.00	-0.03	0.05	**0.64**	0.06	0.28	0.76
Orientation of New Employees	0.00	0.00	-0.02	0.02	-0.02	**0.69**	-0.08	0.22	0.75
Eigenvalue	7.41	3.01	2.42	1.53	1.39	1.25	1.07		
Cronbach's alpha	0.82	0.69	0.78	0.71	0.71	0.70	0.57		
Overall Cronbach's alpha	**0.70**								
Overall KMO	**0.85**								

This table presents the PCA results, with the highlighted cells displaying the factor loadings for each variable. Each factor is associated with elements with a factor loading of more than 0.30,

The validity of the SCGI is reinforced through PCA, with Cronbach's alpha results confirming strong internal consistency across the six governance dimensions. Prior studies that develop a corporate governance index for SMEs focus only on one or a few of the many governance aspects. For example, Nasrallah and El Khoury (2022) incorporate three sub-indices (board, accounting and auditing, and operations), whereas Al-Najjar (2015) integrates only board and audit-related items in their index. Unlike prior studies that often focus on isolated aspects of governance, the SCGI offers a more comprehensive and integrated approach by encompassing six critical subdimensions: Board, Family Involvement, Female Participation, Digitalization, Corporate Accountability, and Succession. This multi-dimensional framework not only provides a more holistic assessment of SME governance but also sets our index apart by capturing the full complexity and nuances of governance practices that are unique to SMEs. As a result, the SCGI offers a deeper, more robust understanding of the governance structures of SMEs than has been achieved in previous studies (Abor & Biekpe, 2007; Roffia et al., 2022).

To employ SCGI and sub-index scores in the regression analysis, we follow Ararat et al. (2017). We provide the scaled versions of each sub-index between 0 and 100 to make SMEs' scores more understandable and comparable. The scaled SCGI score is the average of the scaled sub-index scores. Figure 2 shows that the histogram of scaled SCGI is non-symmetrical and right-skewed. Given SMEs' limited and developing governance practices, more observations in the below-average index scores are reasonable. We calculate the standardized versions of each sub-index, normalizing them to mean=0 and standard deviation=1. Next, standardized SCGI, which is used in the regression analysis, is attained by renormalizing the sum of standardized sub-indices.

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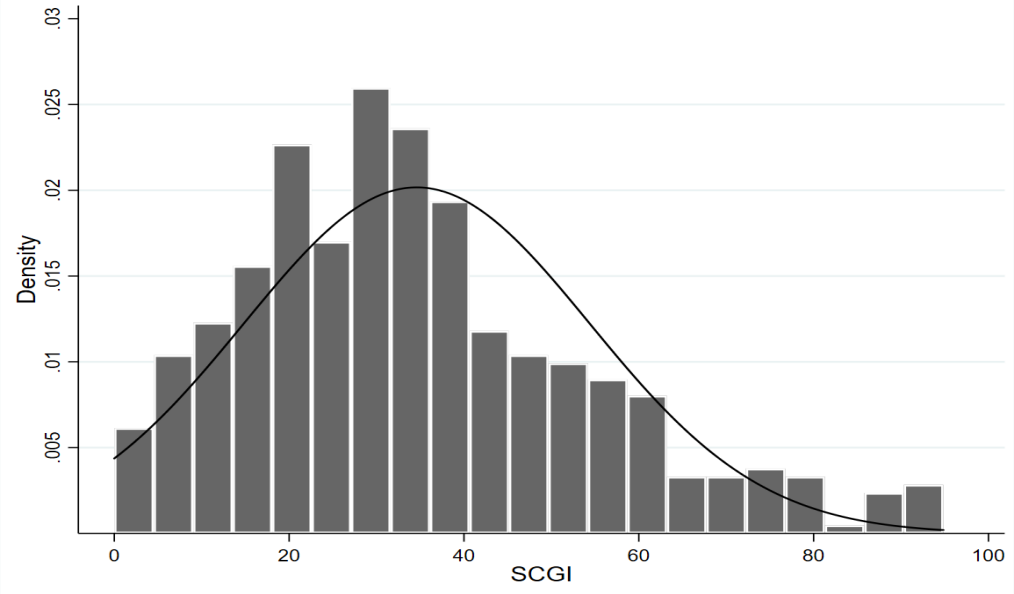

Fig. 2 - Histogram of non normalized SCGI
Source: own research

4.2 Access to finance and SME performance: the mediating role of corporate governance

Table 6 presents the regression results. Model 1 (corresponding to specification 1) tests Hypothesis 1, which proposes a positive association between access to finance and SME performance. The subjective access to finance measures exhibit a positive and highly significant relationship with financial performance ($p < 0.01$). For the objective measures, having a savings account is marginally significant ($p < 0.1$), while the credit limit is not significant. The results indicate that SMEs reporting easier access to finance achieve higher performance, with the relationship more pronounced when access is assessed subjectively.

Access to finance strengthens competitive execution by smoothing cash-flow constraints and enabling timely investment; it may also support continuity in key roles by reducing shock-driven adjustments (see Kijkasiwat & Phuensane, 2020; Steinerowska-Streb & Steiner, 2014). The stronger effects for subjective measures suggest that perceived financing frictions, what managers face in real time, may better capture constraints that matter for day-to-day competitive decisions than static account limits. These findings are consistent with evidence that financing capacity underpins SME growth and performance (Aterido et al., 2011; Beck et al., 2005b; Fowowe, 2017; Motta, 2020). Among controls, size and age carry negative coefficients, in line with Jovanovic's (1982) learning model: smaller and younger firms tend to grow faster as entrepreneurs learn their efficiency over time.

Model 2, corresponding to specification 2, investigates the relationship between access to finance and corporate governance. All four measures of access to finance exhibit a positive and highly significant relationship with corporate governance. The results show that easier access to finance goes hand in hand with stronger governance routines, consistent with the idea that reliance on external capital encourages the adoption of credible controls and decision processes (Chen et al., 2010; Klapper & Love, 2004). These routines lower transaction costs and error rates and improve delivery reliability, which are valued by both creditors and customers. Size shows a positive association with governance, consistent with work suggesting that larger SMEs formalize governance as resources and complexity increase (Black et al., 2006). Age is mostly insignificant, similar to prior findings (Ararat

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et al., 2017). The export indicator is positive, implying that exporting SMEs tend to have stronger governance practices, which aligns with evidence on export exposure and organizational upgrading (Lukason & Vissak, 2020).

Model 3, which represents specification 3, adds the SCGI to the baseline regression. Corporate governance is strongly and positively associated with financial performance, consistent with H2 and with prior evidence that broader governance packages relate to better outcomes (Ararat et al., 2017; Balasubramanian et al., 2010; Bhatt & Bhatt, 2017; Black et al., 2006; Klapper & Love, 2004; Love, 2011; Nasrallah & El Khoury, 2022). In the SME context, the SCGI, tailored only for the SME governance practices, shows a clear performance link. Governance appears to be an organizational capability: it is likely to improve coordination and oversight, reduce execution errors, and strengthen credibility with external partners. These features are directly relevant to competitiveness and complement access to finance by raising the returns firms can realize from external funds.

Formal tests of the indirect effect (Sobel, Aroian, Goodman, and bootstrap CIs) indicate that part of the finance–performance relationship runs through governance; full statistics are reported in Appendix A. The Z-values derived from the Sobel, Aroian, and Goodman tests are highly significant, and the bootstrapped confidence intervals consistently exclude zero. Substantively, access to finance relates to higher performance both directly and indirectly via stronger governance routines. Adopting governance mechanisms tailored to SMEs' characteristics, therefore, serves not only as a performance enhancer but also as a channel through which access to finance translates into improved outcomes. Overall, access to financial resources is critical for SME performance, and robust governance amplifies this effect.

On the other hand, to deal with potential endogeneity issues between corporate governance and firm performance, which could stem from reverse causality, simultaneity, and omitted variable problems, we also use the instrumental variable (IV) approach, employing two-step least squares (2SLS) estimations. We use a CEO characteristic, the education level of the CEO, as our instrument, following Cornett et al. (2009). In the first stage, we regress SCGI on the exogenous instrument (the education level of the CEO), including the control variables and industry dummies. In the second stage of 2SLS, performance is the dependent variable, and the predicted value of SCGI is the independent variable. We display the findings in Appendix B. SCGI loads positively and significantly, suggesting that superior corporate governance is positively associated with stronger performance, even when endogeneity concerns are addressed. We use the first-stage F and Sargan statistics to test weak instruments and their exogeneity, respectively. The findings suggest that our instrument is valid, and the model is correctly specified. This finding implies that corporate governance positively impacts SMEs' firm performance even when we consider endogeneity issues.

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Tab. 6 - The impact of access to finance on performance: the mediating role of governance
Source: own research

	Model 1 (DV: Sales Growth)				Model 2 (DV: SCGI)				Model 3 (DV: Sales Growth)			
SCGI									0.064***	0.068***	0.069***	0.068***
									(5.349)	(6.112)	(5.770)	(5.600)
Subjective AtoF1	0.081***				0.602***				0.042*			
	(3.365)				(5.765)				(1.755)			
Subjective AtoF2		0.027***				0.136***				0.018*		
		(2.724)				(3.022)				(1.859)		
Credit limit			0.034				0.502***				-0.001	
			(1.430)				(4.800)				(-0.027)	
Saving account				0.044*				0.563***				0.006
				(1.742)				(5.131)				(0.227)
Size	-0.005	-0.007	-0.002	-0.005	0.321***	0.323***	0.300***	0.299***	-0.025**	-0.029**	-0.022*	-0.025**
	(-0.416)	(-0.628)	(-0.126)	(-0.369)	(6.132)	(6.044)	(5.405)	(5.503)	(-2.088)	(-2.490)	(-1.775)	(-1.994)
Age	-0.056***	-0.045**	-0.040**	-0.034*	-0.180**	-0.093	-0.025	-0.046	-0.044**	-0.039**	-0.038**	-0.031*
	(-3.083)	(-2.584)	(-2.126)	(-1.869)	(-2.276)	(-1.169)	(-0.304)	(-0.571)	(-2.529)	(-2.329)	(-2.131)	(-1.777)
Export	-0.016	-0.021	-0.017	-0.018	0.306***	0.277***	0.295***	0.268**	-0.035	-0.040*	-0.037	-0.036
	(-0.681)	(-0.933)	(-0.704)	(-0.764)	(3.049)	(2.724)	(2.833)	(2.558)	(-1.565)	(-1.841)	(-1.619)	(-1.572)
Constant	0.162***	0.137**	0.175***	0.165***	-1.162***	-1.310***	-1.296***	-1.227***	0.236***	0.225***	0.264***	0.248***
	(2.740)	(2.241)	(2.841)	(2.743)	(-4.505)	(-4.714)	(-4.749)	(-4.656)	(4.028)	(3.761)	(4.341)	(4.169)
Industry Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Legal Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	357	369	341	341	357	369	341	341	357	369	341	341
R-squared	0.074	0.062	0.047	0.045	0.437	0.388	0.408	0.422	0.145	0.151	0.134	0.129
Adjusted R-squared	0.0449	0.0326	0.0147	0.0136	0.419	0.369	0.388	0.402	0.116	0.122	0.103	0.0969
Mean VIF	1.45	1.42	1.60	1.41	1.45	1.44	1.63	1.43	1.50	1.47	1.63	1.47

This table contains the regression results of models expressed in equations 1-3. Sales growth and SCGI are performance and corporate governance proxies, respectively. Models are estimated separately for each of the four access-to-finance proxies. Robust t-statistics in parentheses. ***, **, and * denote 1%, 5%, and 10% significance levels, respectively. DV denotes "dependent variable".

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Viewed in a broader, cross-country perspective, our results from Türkiye are consistent with international evidence that SME governance routines relate positively to outcomes. In Ghana, core governance features are positively associated with profitability (Abor & Biekpe, 2007). In Lebanon, governance "bundles" are linked to firm performance (Nasrallah & El Khoury, 2022). In Italian family SMEs, family councils can operate similarly to formal boards (Gnan et al., 2015). In the UK, SMEs have been evaluated using concise governance scores based on observable structures (Al-Najjar, 2015). Building on this literature, the SCGI serves as a compact diagnostic tool for non-listed SMEs, combining six governance dimensions with transparent binary scoring. Because items are observable and scoring rules are explicit, the index can travel across settings with minor, context-specific adaptations (e.g., enforcement, banking depth, informality, family ownership, export exposure). These studies suggest a consistent yet context-aware picture: basic, codifiable governance routines often coincide with stronger SME outcomes, largely by improving execution reliability, a core aspect of competitiveness. Moreover, access to finance and governance reinforce one another: external funding pressures are associated with stronger routines, and those routines help firms translate funds into performance. In this light, SCGI offers a clear, reusable measure for benchmarking across countries while keeping interpretations sensitive to institutional, legal, and cultural conditions, positioning it as a practical tool for comparative research and policy diagnostics beyond Türkiye.

These findings also have important implications for SME competitiveness. Access to finance expands the resource base available to firms, but our results show that the combination of finance and governance translates these resources into superior outcomes. Governance strengthens decision-making quality, accountability, and credibility with stakeholders, which enables SMEs to transform financial access into improved sales performance. In this sense, competitiveness does not arise from finance alone; rather, it emerges when SMEs possess the governance capacity to channel financial resources productively. By highlighting this mechanism, our results connect directly to recognized dimensions of competitiveness, such as resilience, credibility, and market positioning, and underscore that policies supporting both finance and governance are essential for SMEs aiming to sustain competitive advantages.

5. ROBUSTNESS

5.1. Alternative methodology to construct corporate governance index (SCGI)

We treat each factor as a sub-index and normalize each factor to mean zero and standard deviation 1, similar to our main index (SCGI). Then we sum normalized factors and re-normalize them to obtain a PCA-derived index, which we label SCGI_PCA. Table 7 presents the regression results using SCGI_PCA (The findings of Model 1 are not re-reported in Table 7, since it is the same as in Model 1 in Table 6). The findings are consistent with those obtained using the main governance index, supporting all three hypotheses. The z-values of the indirect tests are significant, and bootstrap confidence intervals are non-zero (Appendix C – Panel A).

5.2 Alternative proxy for the dependent variable (SME performance)

As a second robustness test, we use sales per employee growth (average two-year logarithmic growth in sales per employee) as a proxy for SME performance. Sales per employee growth is the main indicator of labor productivity growth and is commonly used to assess SME performance (Ayyagari et al., 2011; Ndiaye et al., 2018). Table 8 presents the results. Model 1 generates significantly positive coefficients for all access to finance measures. This finding suggests that access to finance is positively associated with financial performance when performance is defined by labor productivity, providing further support for hypothesis 1. In Model 3, higher SCGI and SCGI_PCA are linked to greater labor productivity, supporting Hypothesis 2. The z-values of the indirect test (Appendix C – Panels B & C) are mostly significant, and all bootstrap confidence intervals are non-zero, demonstrating the robustness of the mediating role of corporate governance.

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Tab. 7 - Access to finance, governance, and performance using corporate governance index derived from PCA
Source: own research

	Model 2 (DV: SCGI_PCA)				Model 3 (DV: Sales Growth)			
SCGI_PCA					0.066***	0.070***	0.071***	0.069***
					(5.738)	(6.514)	(6.207)	(6.014)
Subjective AtoF1	0.621***				0.039			
	(5.808)				(1.645)			
Subjective AtoF2		0.160***				0.016*		
		(3.480)				(1.651)		
Credit limit			0.472***				0.000	
			(4.352)				(0.020)	
Saving account				0.530***				0.007
				(4.639)				(0.285)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry & legal fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	357	369	341	341	357	369	341	341
Adjusted R-squared	0.404	0.356	0.360	0.371	0.126	0.133	0.116	0.109

This table contains the regression results of models expressed in equations 1-3, when the performance proxy is sales growth and when the corporate governance index is derived from PCA analysis (SCGI_PCA). Models are estimated separately for each of the four access-to-finance proxies. All VIF scores are below 3.00. Robust t-statistics in parentheses. ***, **, and * denote 1%, 5%, and 10% significance levels, respectively. DV denotes “dependent variable”.

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Tab. 8 - Access to finance, governance, and performance using sales per employee as performance
Source: own research

	Model 1 (DV: Sales per Employee Growth)				Model 3 (DV: Sales per Employee Growth) (Mediator: SCGI)				Model 3 (DV: Sales per Employee Growth) (Mediator: SCGI_PCA)			
SCGI					0.020**	0.024***	0.025**	0.025**				
					(2.066)	(2.681)	(2.554)	(2.552)				
SCGI_PCA									0.022**	0.025***	0.026***	0.025***
									(2.298)	(2.870)	(2.747)	(2.746)
Subjective AtoF1	0.064***				0.052***				0.050**			
	(3.391)				(2.642)				(2.571)			
Subjective AtoF2		0.017**				0.013*				0.013		
		(2.135)				(1.703)				(1.601)		
Credit limit			0.033*				0.020				0.021	
			(1.771)				(1.073)				(1.098)	
Saving account				0.054***				0.040**				0.040**
				(2.795)				(2.017)				(2.054)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry & legal fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	357	369	341	341	357	369	341	341	357	369	341	341
Adjusted R-squared	0.0364	0.0209	0.0215	0.0389	0.0455	0.0376	0.0377	0.0547	0.0482	0.0403	0.0406	0.0576

This table displays the regression results of models expressed in equations 1-3, when the performance proxy is sales per employee growth. Models are estimated separately for each of the four access-to-finance proxies and for both corporate governance indices (SCGI and SCGI_PCA). All control variables are included in the models. All VIF scores are below 3.00. Robust t-statistics in parentheses. ***, **, and * denote 1%, 5%, and 10% significance levels, respectively. DV denotes “dependent variable”.

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Tab. 9 - Access to finance, governance, and performance, excluding micro-sized firms
Source: own research

	Model 1 (DV: Sales Growth)				Model 2 (DV: SCGI)				Model 3 (DV: Performance)			
SCGI									0.060***	0.064***	0.065***	0.063***
									(4.582)	(5.341)	(5.078)	(4.845)
Subjective AtoF1	0.083***				0.734***				0.039			
	(3.002)				(5.941)				(1.371)			
Subjective AtoF2		0.027**				0.197***				0.014		
		(2.373)				(3.736)				(1.265)		
Credit limit			0.019				0.522***				-0.015	
			(0.686)				(4.105)				(-0.566)	
Saving account				0.041				0.599***				0.003
				(1.285)				(4.095)				(0.093)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry & legal fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	283	293	268	266	283	293	268	266	283	293	268	266
Adjusted R-squared	0.0556	0.0426	0.0224	0.0250	0.377	0.313	0.330	0.335	0.120	0.128	0.109	0.104

This table contains the regression results of models expressed in equations 1-3 when micro-sized firms are excluded. Sales growth and SCGI are performance and corporate governance proxies, respectively. Models are estimated separately for each of the four access-to-finance proxies. All VIF scores are below 3.00. Robust t-statistics in parentheses. ***, **, and * denote 1%, 5%, and 10% significance levels, respectively. DV denotes “dependent variable”.

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5.3 Alternative sample

Micro-sized companies may have certain characteristics and needs that differ from small and medium-sized companies. For example, micro-firms may need financing more desperately, or it may be much more costly to implement corporate governance practices. Our results may be biased because of the micro-sized firms; hence, we exclude the micro-sized firms and repeat the analysis. Our findings, presented in Table 9, are essentially the same, except that the direct relevance of the objective measure of access to finance is more fragile. On the other hand, the indirect relevance of access to finance with performance, which is translated through corporate governance, is robust (Appendix C – Panel D). Untabulated results show that the results do not change with alternative variables.

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6. CONCLUSION

SMEs play a crucial role in the economy, contributing significantly to production, employment, and added value (Ayyagari et al., 2011; Beck et al., 2005a). Limited access to finance is widely recognized as a major constraint on the performance of SMEs, setting them apart from larger companies (Aterido et al., 2011; Beck et al., 2005b; Wang, 2016). Despite this acknowledgment, the role of corporate governance, which could serve as a key link in the relationship between access to finance and performance, has not been thoroughly explored in the context of SMEs. The main reason for this is the lack of a suitable measure to assess SMEs' relative levels of corporate governance. Given the absence of corporate governance measures taking into account the distinctive features of SMEs, the primary purpose of this paper is to construct a corporate governance index for SMEs. With this index, we provide an exploratory inquiry into the subdimensions of corporate governance and initiate the procedure to develop a valid and reliable proxy for corporate governance. This task is relatively complex because no well-developed theory is built on this multi-dimensional construct, i.e., corporate governance, especially in the context of SMEs. To construct our governance index, we collect data from a sample of 469 SMEs from an emerging market, i.e., Türkiye, from six categories: board, family involvement, female participation, digitalization, corporate accountability, and succession. We also employ PCA and develop a seven multi-indicator index from 27 individual governance indicators.

The second purpose of this study is to explore the impact of access to finance on SME performance and investigate the mediating effect of corporate governance in this association. We show that access to finance and performance are positively associated, and corporate governance mediates this relationship. Hence, our study represents an initial attempt to explain the links between the governance index and SME performance. The analysis conducted both with the main index (SCGI) and the PCA index (SCGI_PCA) suggests that corporate governance is positively related to SME performance. Our findings are robust to alternative samples, measurements, and variable definitions. Employing SCGI as a proxy for the overall corporate governance level and using alternative measures for access to finance and performance, our results reveal two major implications for the complex interplay among access to finance, corporate governance, and performance. First, a direct and positive relationship exists between access to finance and performance. Second, we present novel evidence that corporate governance mediates this relationship, suggesting that access to finance is likely to enhance firm performance by contributing to SMEs' corporate governance features. The indirect relationship between access to finance and performance is strongly present even when there is no observed direct relationship between them. This finding implies that corporate governance mechanisms can carry the positive impact of access to finance to SME performance, which could encourage decision-makers to promote effective corporate governance mechanisms. Accordingly, to the best of our knowledge, this study is the first to show that access to finance has both a direct and an indirect effect on SME performance, with the latter being even stronger. Our findings suggest that governance structures play a crucial role in enhancing the positive impact of access to finance on

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SME performance. Even though access to finance is critical for SME performance, robust governance practices are expected to amplify this impact, resulting in stronger performance for SMEs. Effective governance mechanisms, which can be realized with access to finance, are anticipated to enhance SMEs' transparency, risk management, and decision-making processes, enabling better utilization of available financial resources. This, in turn, enhances the firm's operational efficiency and competitiveness, leading to improved performance. Our findings underscore the importance of strong governance practices complementing financial access in driving sustainable growth for SMEs. Firms with stronger governance structures can better translate access to finance into improved performance, which strengthens their competitive standing in the market. In this way, effective governance not only enhances performance but also provides a foundation for SMEs' long-term competitiveness. Moreover, the SCGI can serve as a practical tool for SMEs and policymakers to identify and prioritize governance reforms that directly enhance competitiveness.

The findings of this paper have some theoretical, policy, and practical implications, especially for emerging economy SMEs. From a theoretical perspective, this paper not only contributes to the SME literature by combining the strengths of financial growth cycle, stewardship, resource-based, and agency theories but also advances each of these perspectives with concrete evidence. Specifically, our results support the financial growth cycle theory by showing that governance quality reduces financing frictions and facilitates SME growth; they extend stewardship theory by highlighting how accountability and trust-based governance mechanisms improve SMEs' credibility with lenders; they contribute to the resource-based view by positioning governance as an intangible capability that strengthens SMEs' competitiveness; and they reinforce agency theory by showing how governance reduces entrenchment and information asymmetry, thereby improving access to finance. By explicitly connecting these insights, the SCGI operationalizes theoretical pluralism and deepens our understanding of SME growth mechanisms.

From the practitioners' point of view, provided that SME owners aim to translate their higher access to finance into higher performance, they should give utmost significance to their governance features. Once SMEs improve their access to finance, they should start investing in their governance features, forming a key channel through which access to finance will enhance their firm performance. Access to finance is not likely to assure stronger firm performance unless tied to a broader perspective of effective corporate governance. In particular, SMEs can strengthen board diversity (with greater female participation), enhance transparency and accountability mechanisms, and formalize succession planning. These measures mitigate risks and serve as credible signals to lenders and investors, improving financing opportunities. The SCGI can thus serve as a diagnostic tool, helping SMEs identify weaknesses in their governance structures and prioritize reforms most relevant to enhancing financial access and performance.

Hence, this paper presents novel evidence of a model for SMEs in emerging countries to concentrate more on the role of corporate governance in enhancing firm performance. Although the empirical analysis is confined to Türkiye, similar patterns will likely emerge in other emerging markets, where SMEs face comparable financing frictions, evolving governance frameworks, and institutional constraints. From a policy perspective, the SCGI offers practical value as a benchmarking instrument that enables regulators and development agencies to evaluate SMEs' governance quality systematically. Because the index captures multidimensional aspects of governance, such as board diversity, family involvement, digitalization, accountability, and succession, it provides measurable indicators that policymakers can use to design and monitor targeted interventions. In addition, the SCGI can facilitate cross-country comparisons, helping international organizations and policymakers identify common governance gaps and prioritize reforms that strengthen SME competitiveness and resilience. These findings also provide policy implications: regulators and policymakers in emerging markets can design targeted interventions to promote effective governance practices among SMEs, recognizing that proper control structures are critical to performance, sustainability, and broader economic resilience.

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On the other hand, this study is limited by its geographic scope, as the survey is conducted solely with SMEs in Türkiye. The findings may not fully represent the experiences and practices of SMEs in other countries, which may be influenced by different economic, regulatory, institutional, and cultural contexts. Moreover, as the survey was collected in 2021, the results may not fully reflect the most recent dynamics. In particular, while our analysis provides the first empirical application of the Small and Medium-sized Enterprises Corporate Governance Index (SCGI) in Türkiye, its generalizability remains constrained by the single-country focus and the specific time frame.

Beyond the geographic scope, certain methodological limitations should also be acknowledged. Specifically, we rely on cross-sectional survey data, which restricts the ability to make strong causal inferences. Although we employ robustness checks and alternative measures to enhance the reliability of our results, longitudinal data would provide stronger evidence on the dynamics of governance, access to finance, and performance over time. In addition, survey-based responses may be subject to self-reporting and perceptual biases, despite our efforts to mitigate these issues through face-to-face administration and using subjective and objective measures of access to finance and performance. Finally, while comprehensive, the governance index developed here is exploratory and should be further validated in future studies and across different institutional settings.

Future research should address these limitations by expanding the geographic scope of the study to include SMEs from diverse countries and regions and by incorporating more recent data to capture ongoing economic and institutional developments. Because the SCGI was deliberately designed as a multidimensional and transferable framework, capturing board composition, family involvement, female participation, digitalization, accountability, and succession, it can be readily applied to other institutional and economic settings. Such extensions would allow for meaningful cross-country comparisons, revealing both shared patterns and context-specific differences in the governance–finance–performance nexus. Comparative analyses across different national contexts could provide deeper insights into the relationship between access to finance and the firm performance of SMEs. Moreover, validating the SCGI in a broader international context would also provide policymakers and international organizations with a valuable benchmarking tool to evaluate and enhance SME governance practices globally.

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SUPPLEMENTARY FILE

Appendix A. Tests of the indirect effects

	Z Score			Bootstrap (95% confidence intervals)	
	Sobel	Aroian	Goodman	CI (P)	CI (BC)
Subjective AtoF1	**3.921*****	**3.890*****	**3.953*****	.0205596 .0597867	.0201554 .0597163
Subjective AtoF2	**2.709*****	**2.680*****	**2.738*****	.0030036 .0161957	.0035396 .0169355
Credit limit	**3.69*****	**3.658*****	**3.723*****	.0172685 .0530141	.0206203 .0588821
Savings accounts	**3.783*****	**3.750*****	**3.816*****	.0197361 .0559908	.0215928 .0596528

This table presents the results of indirect effect tests. The z-values of the Sobel, Aroian, and Goodman tests and the bootstrapped confidence intervals presented for each of the four proxies for access to finance. Bootstrapped confidence intervals are based on 1,000 bootstrap samples. CI (P) stands for percentile confidence interval, and CI (BC) for bias-corrected confidence interval. ***, **, and * denote 1%, 5%, and 10% significance levels, respectively.

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	(1)	(2)	(3)	(4)
	Sales Growth	Sales Growth	Sales Growth	Sales Growth
SCGI	.173**	.183**	.195**	.187**
	(2.43)	(2.10)	(2.37)	(2.33)
Subjective AtoF1	-.035			
	(-0.65)			
Subjective AtoF2		.002		
		(0.13)		
Credit limit			-.067	
			(-1.36)	
Saving account				-.071
				(-1.26)
Size	-.063**	-.07**	-.064**	-.063**
	(-2.33)	(-2.16)	(-2.14)	(-2.24)
Age	-.019	-.023	-.032	-.022
	(-0.78)	(-1.05)	(-1.53)	(-1.03)
Export	-.070**	-.071**	-.076**	-.071*
	(-2.02)	(-1.98)	(-1.99)	(-1.93)
Constant	.438***	.444***	.507***	.471***
	(3.55)	(2.85)	(3.20)	(3.20)
Industry Fixed effect	Yes	Yes	Yes	Yes
Legal	Yes	Yes	Yes	Yes
Observations	354	365	337	338
First Stage F-statistics	3.93***	2.44*	2.92**	3.09**
First Stage p-value	(0.01)	(0.06)	(0.03)	(0.03)
Sargan chi2	1.67	2.08	0.20	0.21
Sargan p-value	(0.43)	(0.35)	(0.90)	(0.90)

This table shows the results of the 2SLS regression. The instrumental variable used for corporate governance index (SCGI) is the education level of the CEO, taking ordinal values from 1-4, with 4 representing the PhD degree, 3 representing master degree, 2 representing bachelor degree, and 1 representing primary - secondary school and high school degrees. Robust t-statistics are in parentheses. ***, **, and * denote 1%, 5%, and 10% significance levels, respectively.

Appendix B. Instrumental variable analysis: 2SLS regression results

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Appendix C. Tests of indirect effect for robustness scenarios

Panel A. Performance measure: sales growth, governance measure: SCGI_PCA					
	Z Score			Bootstrap (95% confidence intervals)	
	Sobel	Aroian	Goodman	CI (P)	CI (BC)
Subjective AtoF1	**4.082*** **	**4.051*** **	**4.113*** **	.0235256 .0614753	.0247971 .0660429
Subjective AtoF2	**3.069*** **	**3.042*** **	**3.098*** **	.0036706 .0194436	.0041178 .0201609
Credit limit	**3.563*** **	**3.532*** **	**3.594*** **	.0161447 .0525933	.0161447 .0525409
Savings accounts	**3.673*** **	**3.642*** **	**3.706*** **	.0194344 .0567074	.0202451 .0584636
Panel B. Performance measure: sales per employee growth, governance measure: SCGI					
	Z Score			Bootstrap (95% confidence intervals)	
	Sobel	Aroian	Goodman	CI (P)	CI (BC)
Subjective AtoF1	**1.945***	**1.919***	**1.971** **	-.0007293 .0242665	.0028528 .0284665
Subjective AtoF2	**2.005** **	**1.947***	**2.07** **	.0007171 .0069274	.0008813 .0078043
Credit limit	**2.255** **	**2.218** **	**2.294** **	.0029996 .0242511	.004075 .0254541
Savings accounts	**2.285** **	**2.251** **	**2.321** **	.0026486 .0259483	.0032342 .0262644
Panel C. Performance measure: sales per employee growth, governance measure: SCGI_PCA					
	Z Score			Bootstrap (95% confidence intervals)	
	Sobel	Aroian	Goodman	CI (P)	CI (BC)
Subjective AtoF1	**2.137** **	**2.11** **	**2.165** **	.002307 .026346	.0030016 .0292589
Subjective AtoF2	**2.214** **	**2.162** **	**2.271** **	.0010548 .0081724	.0014662 .0087226
Credit limit	**2.323** **	**2.28** **	**2.368** **	.0030699 .0240625	.0035623 .0258877
Savings accounts	**2.363** **	**2.324** **	**2.405** **	.0031267 .0241613	.0054189 .0279934
Panel D. Performance measure: sales growth, governance measure: SCGI, omit the micro-sized firms					

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	Z Score			Bootstrap (95% confidence intervals)			
	Sobel	Aroian	Goodman	CI (P)		CI (BC)	
Subjective AtoF1	**3.628*****	**3.596*****	**3.661*****	.0197856	.0718168	.0234742	.075286
Subjective AtoF2	**3.061*****	**3.026*****	**3.098*****	.0048522	.022241	.0056974	.0227445
Credit limit	**3.061*****	**3.026*****	**3.098*****	.0139882	.0586443	.0154504	.0607979
Savings accounts	**3.127*****	**3.089*****	**3.167*****	.0148737	.0619226	.018403	.0695441

This table shows the results of tests of indirect effect for each robustness scenario. The z-values of the Sobel, Aroian, and Goodman tests and the bootstrapped confidence intervals presented for each of the four proxies for access to finance. Bootstrapped confidence intervals are based on 1,000 bootstrap samples. CI (P) stands for percentile confidence interval, and CI (BC) for bias-corrected confidence interval. ***, **, and * denote 1%, 5%, and 10% significance levels, respectively.

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