Lahore Journal of Business
Volume 13, Issue 2,
Spring 2026

How Do Firms Achieve Their Capital Structure? A Configurational Analysis Using fsQCA

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Citation: Salman, V., & Naz, F. (2026). How Do Firms Achieve Their Capital Structure? A Configurational Analysis Using fsQCA. *The Lahore Journal of Business, 13*(2), 89-124. https://doi.org/10.35536/ljb.2026.v13.i2.a4

Abstract: *This research explains the contemporaneous role of credit ratings and financial characteristics for capital structure decisions. It offers a comparative analysis of financial and non-financial firms for 2019–2023. Fuzzy-set qualitative comparative analysis (fsQCA) was employed. Size, age, leverage, total debt, total equity, and their respective changes were found to be necessary for capital structure adjustments for financial firms. In contrast, only total debt was found to be necessary in non-financial firms. Contrary to credit rating-capital structure theory, the results shift the perspective. Ratings were neither necessary nor sufficient for either sector's capital structure decisions, indicating they are not central but contextual factors with limited explanatory power. The configurational analysis showed that the core and the peripheral also vary across the firms. It can be implied that firms' internal characteristics matter more than external credit ratings for changes in capital structure decisions. Regulators should focus on multi-dimensional supervision in the financial sector, while managers would benefit from optimal leverage, efficient debt servicing, and liquidity management in the non-financial sector. Researchers and practitioners are recommended to employ fsQCA as an auxiliary diagnostic method to identify additional causal factors. The study contributes by comparing Pakistan's financial and non-financial firms through a configurational lens.*

Keywords: Credit rating, capital structure, financial characteristics, Pakistan, non-financial firms, financial firms.

JEL Classification: G21, G24, G32.

Paper type: Research paper

Received: 19th December 2025 Revised: 27th April 2026 Accepted: 26th June 2026

Conflict of interest:
The authors declare no conflict of interest.

Funding:
There is no funding for this research.

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1. Introduction

One of the most important financial decisions firms face is determining the optimal mix of debt and equity financing. Capital structure decisions directly influence shareholder value, financing costs, financial flexibility, and long-term organizational sustainability (Liao et al., 2024). Consequently, capital structure has remained one of the most extensively studied topics in corporate finance since the seminal work of Modigliani and Miller (1958).

Capital structure refers to the manner in which firms finance their operations and investments through a combination of debt and equity (Miglo, 2025). More reliance on either of the two has both pros and cons. Firms that prefer debt financing to avoid ownership dilution benefit from tax shields. However, they increase their chance of distress and default. It also increases the risk of financial distress and default. Thus, investors and lenders want to know the repayment capacity and capability of the firm before committing their investment (Feda, 2020). In this regard, the role of credit ratings is essential. They signal to investors/lenders about firms' creditworthiness (Judge & Korzhenitskaya, 2022). This, in turn, facilitates the firms' access to the debt markets and influences their borrowing costs (Cash & Khan, 2024). Particularly in emerging markets, sovereign credit ratings affect financing conditions and financial development. It is because investors often rely on external ratings to compensate for weaker institutional environments (Kowalewski et al., 2025). As a result, capital structure decisions are increasingly viewed as being sensitive to external financing conditions and credit market signals (Arhinful et al., 2025).

In Pakistan, credit ratings are assigned by local agencies such as the Pakistan Credit Rating Agency (PACRA) and VIS Credit Rating. They work under the regulatory oversight of the Securities and Exchange Commission of Pakistan. These agencies generally adopt methodologies aligned with international rating agencies such as S&P and Moody's. However, information asymmetry, limited disclosure practices, and

concerns regarding transparency make credit ratings particularly important for investors seeking an assessment of default risk (Feda, 2020). Consequently, firms have incentives to maintain or improve their credit ratings, which may influence their financing choices and capital structure decisions (Ali et al., 2020).

The relationship between credit ratings and capital structure is explained by the credit rating-capital structure (CR-CS) theory developed by Kisgen (2006). The theory argues that firms consider the implications of financing decisions on their credit ratings and adjust their capital structures accordingly. Although Kisgen's findings received substantial support in the US context, subsequent studies have produced inconsistent results (Kemper & Rao, 2013). Moreover, most existing studies have focused either on sovereign credit ratings or on firm-level ratings in developed economies (Judge & Korzhenitskaya, 2022). Consequently, whether firms operating in emerging markets respond to credit ratings in a similar manner remains an unresolved question. For example, evidence from the US suggests that firms close to a rating upgrade tend to issue less debt to preserve the benefits associated with higher ratings (Kisgen, 2006). However, studies conducted in emerging economies have reported mixed findings (Kemper & Rao, 2013), indicating that institutional conditions may shape how firms respond to credit rating signals.

These inconsistencies suggest that the influence of credit ratings on capital structure is more complex than a simple linear relationship would imply. Credit ratings do not operate in isolation; rather, their effects may depend on how they interact with firm-specific financial characteristics. Firms often face multiple, interconnected conditions simultaneously. Different combinations of these conditions may shape financing decisions. Therefore, understanding capital structure adjustment requires moving beyond traditional net-effect approaches and examining how credit ratings and financial characteristics jointly influence financing choices.

This study addresses this gap by examining the CR-CS relationship in Pakistan. It is an emerging economy characterized by relatively shallow capital markets, limited liquidity, and a strong reliance on bank financing. The country also presents an evolving regulatory environment in which institutions such as the Securities and Exchange Commission of Pakistan and PACRA are working to improve transparency and market credibility.

Nevertheless, information asymmetry, weak investor protection, and political and economic uncertainty continue to shape financing decisions. Furthermore, Pakistan's rating environment is unique because firm-level ratings are primarily issued by local agencies, while sovereign ratings are assigned by international agencies. Similar to global rating agencies, local agencies may face concerns regarding conflicts of interest and rating bias, particularly because they are compensated by the firms they evaluate (Becker & Milbourn, 2011; Khatami et al., 2016). Such challenges may have even greater implications in emerging markets where institutional safeguards are comparatively weaker. Therefore, Pakistan provides a valuable context for examining how credit ratings and firm characteristics jointly influence capital structure adjustment decisions.

To capture this complexity, the study adopts fuzzy-set qualitative comparative analysis (fsQCA). Unlike conventional regression techniques focused on the independent effects of variables, fsQCA assumes that outcomes emerge from configurations of interrelated conditions. The method is grounded in three core principles: causal complexity, equifinality, and causal asymmetry. Causal complexity suggests that no single factor is sufficient to explain an outcome; rather, outcomes emerge from combinations of conditions. Equifinality proposes that multiple pathways can lead to the same outcome. Causal asymmetry implies that the factors leading to the presence of an outcome may differ from those leading to its absence.

Guided by these principles, the study investigates whether credit ratings and financial characteristics act as structural constraints or jointly shape capital structure adjustment decisions in financial and non-financial firms.

This study contributes to the literature in several ways. Theoretically, it extends the CR-CS literature to Pakistan, a context that has received limited attention despite the dominance of evidence from the US and other developed economies. Rather than proposing an alternative theory, the study offers a configurational refinement of CR-CS theory, which is particularly valuable given the mixed empirical findings reported in previous research. Methodologically, it introduces a configurational perspective into a literature largely dominated by regression-based

approaches by demonstrating how interdependent combinations of conditions shape financing decisions. Using fsQCA, the study identifies multiple pathways leading to capital structure adjustment and compares these pathways across financial and non-financial firms. Empirically, it provides evidence regarding the combined role of short-term and long-term credit ratings and firm-specific financial characteristics in shaping capital structure adjustment decisions. Finally, the findings offer practical insights for managers operating in environments where credit ratings serve not only as market signals but also as strategic constraints that influence financing decisions.

On the whole, the paper extends geographical coverage, introduces a new measure of rating changes, and offers new evidence that enhances theoretical knowledge of the impact of credit ratings on capital structure. This research is structured as follows: Section 2 reviews relevant literature, while section 3 describes the methodology. Section 4 covers the results and discussion, and section 5 concludes the paper.

2. Review of Literature

2.1. Theoretical Integration: Classical Theories vs. CR-CS Theory

Capital structure decisions that involve determining the right mix of debt and equity financing are grounded in several theories. Initially, the Modigliani and Miller theorem suggested that capital structure decisions were irrelevant to a firm's value under perfect market conditions (Modigliani & Miller, 1958). However, its restrictive assumptions limited its application in real-world settings with market imperfections. Subsequently, other theories attempted to highlight the importance of capital structure decisions. The trade-off theory primarily focuses on internal, firm-level determinants, suggesting that companies optimize their financing decisions by weighing the tax advantages associated with debt against the costs of bankruptcy to determine the optimal level of leverage (Kraus & Litzenberger, 1973). It does not explicitly include credit ratings but indirectly supports their relevance, as ratings indicate a firm's perceived default risk. The pecking order theory also focuses only on firm-level determinants. It suggests that to acquire funds, firms prefer to use internal funds first, then debt, and finally equity, due to differences in information. Managers typically hesitate to issue new equity if they fear

the market might view it negatively (Meckling & Jensen, 1976). This theory also does not account for the role of external factors such as credit ratings. Agency theory, which examines the conflicts of interest between shareholders and managers, or between creditors and managers, explains how capital structure can help resolve these conflicts through mechanisms such as oversight and bonding (Meckling & Jensen, 1976). Once again, the focus is on internal factors that lead to conflicts of interest. Collectively, these traditional theories have been influential in capital structure research. However, they often overlook the impact of external market or institutional signals, such as credit ratings, on financial policies, especially in emerging markets where market imperfections are more noticeable.

The sole reliance on internal, firm-level factors and the lack of focus on external indicators served as motivation for developing the CR-CS theory (Kisgen, 2006). This theory filled the gap by conceptualizing the external institutional dimension and the market's perception of a firm's creditworthiness in capital structure decisions. It proposes that firms near a rating change boundary will act cautiously regarding their capital structure adjustment decisions to either avoid a downgrade or secure an upgrade. They do so due to the costs and benefits associated with shifts in credit rating categories. These behaviors reflect firms' concerns about maintaining or improving their credit standing, which influences borrowing costs, investor confidence, and access to capital markets. In this sense, CR-CS is not about firms' optimization decisions. In reality, credit ratings act as constraints that can condition firms' capital structure adjustment behavior instead of determining capital structure outcomes. Hence, it goes beyond the internal optimization logic. The trade-off theory is distorted if the cost of debt rises disproportionately when businesses are at risk of a credit downgrade. Similarly, a firm with a high rating would make debt issuance cheaper and may, therefore, change the preference for financing order. Likewise, a conflict between managers and external stakeholders could intensify if managers pursue these ratings for higher pay and a better reputation, without considering the company's long-term value. Therefore, CR-CS theory complements rather than contradicts classical theories by providing an adaptable view of capital structure choices. It explains firms' behavior in adjusting their capital structures in response to external factors, i.e., credit ratings. However, later studies (Kemper & Rao, 2013) question whether these findings are generalizable or not.

2.2. *Complexity Theory*

While this research builds on the CR-CS theory, it does not focus solely on a single perspective as previous studies did. It attempts to consider both internal and external factors simultaneously, shaping capital structure adjustment decisions because they are configurational. They cannot be adequately explained through either lens in isolation. Instead, these decisions stem from simultaneous consideration of both, highlighting conjunctural causation. Hence, this study also extends the nexus of the aforementioned traditional theories by integrating them with the complexity theory. Complexity theory explains the complex and asymmetric relationships among variables, which further aid in deciphering how outcomes are affected by the interrelationships among simultaneously occurring conditions (Acquah, 2024). The theory suggests that an outcome can result from the complex interplay of multiple causal factors (causal complexity), so several different conditions can lead to the same outcome (equifinality), and the same factors may not be sufficient/necessary for an opposite outcome (causal asymmetry) (Ragin, 2008). The empirical evidence (section 2.3) shows how symmetric relationships have been established in the literature. However, symmetric techniques remain insufficient in explaining the complex links as guided by complexity theory (Lythberg et al., 2022).

2.3. *Empirical Evidence from Symmetric Relationships*

Despite the growing interest in credit ratings and capital structure, significant research gaps persist. Most studies have focused on UK and European firms, while South Asian countries remain underexplored. Kisgen (2006) utilized a US sample and found a strong link between firms' proximity to rating changes and cautious capital structure decisions. Previous research also highlighted the role of credit ratings in narrowing information gaps in developed markets (Becker & Milbourn, 2011; Khatami et al., 2016). Yet, these findings do not apply consistently everywhere. Another piece of research covered non-financial UK-based firms from 1989 to 2010. They reported the significant role of credit rating in driving leverage ratios (Judge & Korzhenitskaya, 2022).

In emerging countries such as Pakistan, a non-linear, positive relationship between credit ratings and the capital structure of non-financial

firms was found using ordinary least squares from 2012 to 2018 (Ali et al., 2020). On the other hand, covering the period from 2017 to 2020, a negative impact of credit rating on the capital structure of non-financial firms was established, where firm size played a moderating role (Naeem et al., 2022). Similarly, it was found that in emerging economies, credit ratings serve as a signal; hence, a better credit score indicates a higher debt-to-asset ratio (Bwowa et al., 2024). In emerging markets, the institutional environment, standards of transparency, and depth of financial markets can differ greatly from those in developed economies. In China, the application of the CR-CS theory is limited due to weak investor protection and information gaps. In such cases, firms may not always adjust their leverage based on ratings, as credit ratings can be seen as less reliable or biased (Zhou et al., 2024).

The latest research has highlighted the effect of sovereign ratings on capital flows and firms' financing decisions. Emerging markets in the Balkans show evidence that sovereign credit upgrades boost capital inflows, thereby changing domestic financing conditions. The inclusion of these findings enhances the literature through the association of macro-level rating dynamics with a firm-level capital structure adjustment in Pakistan and policy relevance (Athari et al., 2021). Another study finds that projected operating efficiencies (in response to which firms vary in their credit ratings and, consequently, their ability to operate), correlate with variations in ratings with feasible borrowing limits (Ismail & Safieddine, 2025). According to this mechanism, credit-rating dynamics may have a direct restrictive or facilitating impact on leverage decisions. This creates a microeconomic pathway that can be applied to CR-CS testing in emerging markets such as Pakistan. It is because, with its evolving regulatory framework and reliance on domestic rating agencies such as PACRA and VIS, Pakistan presents a unique opportunity to explore these relationships. Additionally, studies that truly consider this differentiation between financial and non-financial firms have been few and far between. It is noteworthy that the two sectors exist within entirely different regulatory environments and risk profiles.

Traditionally, several other factors also play a role in understanding how firms decide on optimal capital structure. In firms across the SAARC region, firm size significantly affects capital structure decisions (Shahzad et al., 2021). Moreover, larger firms with more stability

and a stronger reputation have better access to financing (Raza et al., 2021). Firm age has also been tested as a factor influencing capital structure decisions (D'Amato, 2020; Loan et al., 2020). With respect to leverage, it was found that firms with higher leverage tend to have higher debt and equity financing in the future (Poursoleyman et al., 2023). Similarly, it has been reported that having higher leverage leads to complexity in firms' capital structure decisions (Orlova et al., 2020).

2.4. Research Propositions for Asymmetric Relationships

The existing literature applies symmetric analysis techniques to establish the net effects of credit ratings and firms' financial characteristics on capital structure adjustments in developed economies. However, a recent study highlights the non-linear and heterogeneous nature of capital structure dynamics as it is influenced by a combination of firm-specific and other contextual factors (Botta & Colombo, 2022). This indicates that considering the interactions of various factors can yield a comprehensive view of the factors simultaneously affecting capital structure adjustment decisions rather than their net effects. Furthermore, the dearth of studies in the emerging economies context fuels the current research.

Grounded in the principle of causal complexity, multiple conditions can be configured into various combinations to obtain the outcome. Hence, it is proposed that:

> **Proposition 1:** Different combinations of conditions (broad credit ratings, firm size, firm age, leverage, total debt, change in debt, total equity, and change in equity) can lead to capital structure adjustments **(causal complexity).**

Based on the principle of equifinality, the same outcome can be achieved through different combinations of causal conditions. Hence, we posit that:

> **Proposition 2:** Different combinations of conditions (broad credit ratings, firm size, firm age, leverage, total debt, change in debt, total equity, and change in equity) can produce the same outcome, i.e., capital structure adjustments **(equifinality).**

Stemming from the principle of causal asymmetry, the presence of conditions leading to the outcome does not mean their absence would prevent such an effect. Hence, we propose that:

> **Proposition 3:** Combinations of conditions (broad credit ratings, firm size, firm age, leverage, total debt, change in debt, total equity, and change in equity) leading to capital structure adjustments differ from those associated with the absence of capital structure adjustments **(causal asymmetry).**

3. Research Methodology

This quantitative research empirically tests the necessity and sufficiency of credit ratings and financial characteristics for capital structure adjustments. The unit of analysis is the firm-year, with a total of 230 cases across 46 firms over five years. Firms were segregated into financial (140 cases = 28 firms * 5 years) and non-financial (90 = 18 firms * 5 years) firms. The financial firms include banks, microfinance institutions, *modarabas,* and investment banks, and the non-financial firms include manufacturing companies.

The sample size turned out to be smaller, but it is justifiable on contextual and methodological grounds. First, the study aimed to capture recent trends and capital-structure dynamics before, during, and after COVID-19. Recent studies reported changes in the capital structures of Pakistani firms during the crisis period (Mohammad, 2022). However, credit ratings data showed stable ratings, indicating a conservative approach. Therefore, the latest five years of data were collected.

Second, insurance firms have their own credit rating techniques, so rating assignments differ significantly from those of other firms. Therefore, to ensure validity, uniformity, and comparability across firms, they were deliberately excluded. Furthermore, due to data unavailability, several other firms were eliminated from both types. This was to ensure data integrity and make the dataset well-balanced. The smaller number of observations driven by the aforementioned reasons informed the methodological choice. The variables included in the research are presented in Table 1.

Table 1: Variables measurement

Outcome variable	Formula/description	Source
Capital structure adjustments	(Δ debt - Δ equity)/beginning total assets	Kisgen (2006), (Ali & Javid, 2015)
Total debt	Short-term debt + long-term debt + current portion of long-term debt + notes payable	(Krichene & Khoufi, 2015)
Change in debt	(Total debt $_t$ - total debt $_{t-1}$) / total debt $_{t-1}$	(Kisgen, 2006)
Total equity	Book value of shareholders' equity	(Ali & Javid, 2015)
Change in equity	(Total equity $_t$ – total equity $_{t-1}$) / total equity $_{t-1}$	(Kisgen, 2006)
Broad rating (long & short term)	Broad credit rating dummy variable with ordinal values BRL: 1–5, where 1 is the highest rating BRS: 1–5, where 1 is the highest rating	(Kisgen, 2006; PACRA, 2020)
Leverage	(Total debt)/(total equity)	(Dasilas & Papasyriopoulos, 2015; Haron, 2014)
Firm size	Natural log of total assets	(Krichene & Khoufi, 2015)
Firm age	No. of years since incorporation	(Ali & Javid, 2015)
Type (for making a subset only & not for analysis)	Dummy variable: 1 = financial firm; 0 = non-financial firm	Developed for this study

*The short ratings are as follows: 1 (highest credit quality) = A1+, 2 = A1, 3 = A2, 4 = A3, 5 (lowest credit quality) = A4.
*The long ratings are as follows: 1 (highest credit quality) = AAA+/-, 2 = AA+/-, 3 = A+/-, 4 = BBB+/-, 5 (lowest credit quality) = BB+/-.
BRL = broad rating long, BRS = broad rating short.

3.1. Fuzzy-Set Qualitative Comparative Analysis

The use of fsQCA is of particular essence in this research in the sense that the methodology can be used to seek how configurational causality, causal asymmetry, and equifinality are influenced by credit ratings when combined with other conditions at the firm level, which cannot be effectively measured using the regression-based methodological framework (Fiss, 2011; Ragin, 2008). Moreover, regression is a symmetric technique where each variable makes a linear and independent contribution, while capital structure decisions are rather combinatorial and threshold-based. This means firms adjust their capital structures when a specific combination of conditions triggers it. Due to the complexity and

heterogeneity of financing design decisions, fsQCA offers a strong methodological paradigm for identifying multiple ways to arrive at the same capital structure decisions.

3.1.1. Outcome and Causal Conditions

The outcome variable, capital structure adjustments, is operationalized as the change in total debt to the change in total assets divided by beginning total assets. The causal conditions include credit ratings, which are the perceived creditworthiness of firms by credit rating agencies, and firms' financial characteristics, i.e., size, profitability, value of tangible assets, and growth opportunities. Together, these reflect the complexity of capital structure decisions (Myers, 2001).

3.1.2. Calibration of Variables

FsQCA requires raw data to be transformed and calibrated to fuzzy-set membership scores. The direct method, which is suitable for small samples (Ragin, 2008), was used to carry out calibration. Three qualitative anchors (full membership (1), crossover point (0.5), and full non-membership (0)) were assigned to each variable. These anchors are theory-driven, which allows meaningful distinction, instead of random cut-offs, among firms meeting or not meeting the conditions for the outcome to occur. The minimum, average, and maximum values of each variable were used to calibrate them (Table 2).

Table 2: Calibration of variables

Panel A: Financial firms	**Full membership (1)**	**Crossover (0.5)**	**Full non-membership (0)**
Capital structure	1.38	0.835571	0.28
Broad rating long	5	2.357143	1
Broad rating short	5	1.857143	1
Firm size	22.61829	18.50218	13.54953
Leverage	80.81662	12.09056	-203.7628
Firm age	160	32.07143	2
Total equity	319,000,000	38,800,000	-6,640,802
Total debt	6,270,000,000	633,000,000	171,825
Change in debt	1,380,000,000	97,100,000	-151,000,000
Change in equity	61,200,000	4,510,852	-12,800,000

Panel B: Non-financial firms	Full membership (1)	Crossover (0.5)	Full non-membership (0)
Capital structure	1.32	0.554333	0.01
Broad rating long	3	2.411111	2
Broad rating short	3	1.688889	1
Firm size	20.96079	18.03602	15.17381
Leverage	30.98409	-3.853492	-224.1741
Firm age	101	43.05556	12
Total equity	158,000,000	38,300,000	-23,100,000
Total debt	1,230,000,000	130,000,000	1,356,928
Change in debt	428,000,000	-2,324,880	-845,000,000
Change in equity	59,800,000	3,753,280	-15,500,000

The credit rating grades (categorical and rankable) are transformed into an ordinal numerical scale prior to calibration. Hence, the highest and lowest rankings are shown by 1 and 5, respectively. The ranking information is thus preserved, as the scale successfully avoids over-fragmentation while displaying granularity. Moreover, the ranking aligns with the analytical interpretation.

3.1.3. Necessary Conditions Analysis

A necessity analysis is done to determine whether individual conditions are essential to attain the outcome. A consistency value of 0.90 or above reflects a necessary condition, as suggested by Dul et al. (2020) and Dul et al. (2021) whereas 0.80–0.89 implies a quasi-necessary condition. Hence, it examines whether Y exists when X is present.

$$Consistency_{Nec}\ (X \leq Y) = \frac{\sum \min(X_i, Y_i)}{\sum X_i}$$

where (X) is the causal condition, and (Y) is the result (capital structure). The coverage, on the other hand, quantifies the empirical importance of X, i.e., how much of Y is explained by X, and ranges between 0.25 and 0.75 (Ragin, 2008; Schneider & Wagemann, 2012).

$$Coverage\ _{Nec}\ (X \leq Y) = \frac{\sum \min(X_i, Y_i)}{\sum Y_i}$$

3.1.4. Sufficiency Analysis and Construction of Truth Tables

A truth table consists of multiple pathways with different combinations of conditions leading to the outcome. It examines jointly sufficient causes that result in the outcome (Ragin, 2008; Schneider & Wagemann, 2012). The path in fsQCA is a particular arrangement of the causal conditions (presence by the * or absence by the ~) that may bring out the desired outcome. Consistency values above 0.80 signify sufficiency (Dul et al., 2020; Fiss, 2011), calculated using the same formula as in necessary conditions analysis.

A frequency cutoff of 1 was used, given the study's exploratory nature and small sample size. This ensured that all observed configurations were included. It is acknowledged that using this threshold can potentially increase the risk of spurious configurations, and consistency thresholds were applied to mitigate this risk. The consistency threshold was 0.82 in financial firms and 0.92 in non-financial firms, which is aligned with modern methodological guidelines (Dul et al., 2021; Greckhamer et al., 2018). The difference reflects the heterogeneous characteristics of both types of firms. As financial firms are highly regulated and exhibit relatively uniform operational and financial behavior, the threshold is lower than for non-financial firms, which have a higher consistency threshold because they are less regulated and have differences among them.

3.1.5. Derivation of Solution and Strength

The total number of possible configurations for this study was 2^k, where k is the number of conditions involved, i.e., 9. Hence, $2^9 = 512$ configurations, which would have been difficult to interpret. As this solution (later in Table 5) showed 6 and 3 configurations in panels A and B, respectively, the logical remainders (configurations possible but not observed in actual data) were 506 = 512 – 6 and 509 = 512 – 3, which were merged or excluded. Now, some of the observed configurations may have contradictory rows where some cases lead to the outcome variable while others do not. Based on the reported consistency values, 80 percent of the cases resulted in the outcome variable. Here, the logical minimization process provided the intermediate solution with only the observed configurations, while minimizing contradictions. Furthermore, row-level consistencies were reported, given the small-N nature of this research.

The findings are explained by distinguishing between core and peripheral conditions, with credit ratings at the center of configurations that result in unique capital structure decisions.

4. Results and Discussion

4.1. Descriptive Statistics

Table 3 shows descriptive statistics that provide information on the structural features and financial heterogeneity of the sampled firms, which is the basis for further necessary and sufficient condition analyses.

Table 3: Descriptive statistics

Panel A: Financial firms (140 observations)				
Variable	**Mean**	**Std. dev.**	**Min**	**Max**
Capital structure	0.835571	0.196528	0.28	1.38
Broad rating long	2.357143	0.882046	1	5
Broad rating short	1.857143	0.978704	1	5
Firm size	18.50218	2.581053	13.54953	22.61829
Leverage	12.09056	21.36189	-203.7628	80.81662
Firm age	32.07143	30.71326	2	160
Total equity	38,800,000	57,700,000	-6,640,802	319,000,000
Total debt	633,000,000	977,000,000	171,825	6,270,000,000
Change in debt	97,100,000	215,000,000	-151,000,000	1,380,000,000
Change in equity	4,510,852	9,313,801	-12,800,000	61,200,000
Panel B: Non-financial firms (90 observations)				
Variable	**Mean**	**Std. dev.**	**Min**	**Max**
Capital structure	0.554333	0.272553	0.01	1.32
Broad rating long	2.411111	0.494791	2	3
Broad rating short	1.688889	0.664415	1	3
Firm size	18.03602	1.430862	15.17381	20.96079
Leverage	-3.853492	35.21596	-224.1741	30.98409
Firm age	43.05556	23.018	12	101
Total equity	38,300,000	34,400,000	-23,100,000	158,000,000
Total debt	130,000,000	260,000,000	1,356,928	1,230,000,000
Change in debt	-2,324,880	132,000,000	-845,000,000	428,000,000
Change in equity	3,753,280	10,200,000	-15,500,000	59,800,000

The results reveal that financial firms make adjustment decisions about capital structure with a higher value (0.84) compared to non-financial

firms (0.55). This suggests that financial firms rely more on debt financing. Non-financial firms appear to be more cautious, favoring internal funds and equity issuance. Both types of firms have investment-grade long-term credit ratings, which aligns with evidence showing that well-capitalized banks and insurers receive stronger ratings (Krystyniak & Staneva, 2024). Short-term ratings also reflect strong repayment capacity, although financial firms typically have better ratings than non-financial firms.

Among 230 firm-year observations, 139 cases (about 60 percent) show a disagreement between long- and short-term ratings, indicating significant rating variability. Prior studies link this disagreement to uncertainty, information costs, and differing rating assessments rather than random noise (Becker & Milbourn, 2011; Bolton et al., 2012; Morgan, 2002). Even though ratings cover five categories, most observations fall between categories 2 and 3, limiting variation and potentially reducing the effectiveness of fsQCA. The presence of rating disagreement and limited variability suggests that credit ratings might have a restricted role in configurational analysis. Consistent with previous research (Avramov et al., 2009), rating variability indicates information imbalance, agency-specific practices, and uncertainty, especially among unclear or financially troubled firms. Similar findings come from Becker and Milbourn (2011) and Morgan (2002).

Financial firms are generally larger than non-financial firms, which supports their superior access to external financing. Leverage is more unstable across both groups but remains higher in financial firms (12.09) than in non-financial firms (-3.85), reflecting debt-heavy business models. This difference highlights varying leverage strategies and capital adequacy needs (Ling & Wu, 2022). Negative minimum leverage values may stem from accounting disparities or periods of financial difficulty.

On average, non-financial firms are older (43 years) than financial firms (32 years), indicating greater organizational maturity. Debt levels and changes are higher among financial firms, while equity levels are roughly the same across the groups. Positive but variable changes in equity (mean = 3.75 million; std. dev. = 10.2 million) suggest occasional capital injections or share buybacks intended to lower financing costs under credit-rating pressure (Kim et al., 2023). Overall, financial firms show

larger size, leverage, and capital bases, whereas non-financial firms display greater volatility and asymmetry. These trends support existing evidence of industry differences in credit risk and capital structure (Liao et al., 2009). The descriptive results lay the groundwork for the following configurational analysis by emphasizing distinct debt-, equity-, and leverage-related credit dynamics across financial and non-financial firms.

4.2. Necessary Conditions Analysis

The necessary conditions analysis in Table 4 establishes the necessary factors that are insufficient to bring about a particular outcome (Dul et al., 2021).

Table 4: Necessary conditions analysis

Conditions	Financial firms		Non-financial firms	
	Consistency	Coverage	Consistency	Coverage
Broad rating long	0.657489	0.776333	0.419858	0.883737
Broad rating short	0.451909	0.800130	0.211284	0.862379
Firm size	0.824339	0.711615	0.757201	0.934937
Leverage	0.915015	0.838520	0.719248	0.910749
Firm age	0.918686	0.524798	0.731616	0.880686
Total equity	0.949890	0.558252	0.757371	0.829160
Total debt	0.971549	0.544884	1.000000	0.745390
Change in debt	0.913362	0.719387	0.760420	0.909791
Change in equity	0.940345	0.647825	0.760929	0.858700

For financial firms, the results show that broad ratings (long and short) are not necessary for capital structure adjustments. Firm size appears to be quasi-necessary, while leverage, age, total equity, total debt, and their changes serve as the necessary conditions in financial firms' capital structure decisions. Not only do their consistency values exceed the 0.90 mark, they also cover a significant number of cases (the necessity of totals and changes in debt and equity requires caution for their proximity toward capital structure adjustment). For non-financial firms, the results indicate that only total debt is necessary to determine capital structure adjustments, while all other conditions are unnecessary.

More importantly, however, long-term credit ratings or even short-term credit ratings are not conditions of either sector. That is, companies

do not have to reach a specific rating level before altering their financing mix. Credit ratings have the potential to influence the cost and availability of external funds, but they are not necessarily the preconditions for capital structure changes. Financing decisions thus seem to be more influenced by the financial capacity of the firms themselves than by evaluations of their creditworthiness by others, particularly debt and equity resources. The results highlight that the level of balance sheet strength is the key driver of capital structure change, whereas credit ratings are used as complementary signals and not as strict limitations.

4.3. Truth Table Analysis

The truth table analysis in Table 5 was performed to determine the existence of sufficient configurations (paths) that bring about desirable credit ratings among financial and non-financial firms.

Table 5: Truth table analysis

Panel A: Financial firms											
For CS	**BRL**	**BRS**	**Size**	**Lev**	**Age**	**TE**	**TD**	**ΔDt**	**ΔEq**	**Consistency**	**Coverage**
1	~	~	~	~	~	~	~	~		0.808381	0.414280
2	~	~	~	~	*	~	~	*		0.812449	0.371328
3	~	~	*	*		*	*	*	*	0.932452	0.699339
4	*	*	*		*	*	*	*	*	0.846956	0.446953
5	~	~	~	~	~	~	~		~	0.804340	0.408223
6	~	~	~	~		~	~	*	~	0.817762	0.422540
Solution consistency: 0.7812; solution coverage: 0.9064.											
Frequency cutoff = 1; consistency cutoff = 0.82.											
* = presence											
~ = absence											
Panel B: Non-financial firms											
1	~	~		*		~	*	*	~	0.973243	0.462216
2	~	~		*	~		*	*	*	0.929094	0.495086
3	~	~	*	*		*	*	*	*	0.979787	0.624195
Solution consistency: 0.9493; solution coverage: 0.7069.											
Frequency cutoff = 1; consistency cutoff = 0.92.											

BRL = broad rating long, BRS = broad rating short, CS = capital structure, Lev = leverage, TD = total debt, TE = total equity, ΔDt = change in debt, ΔEq = change in equity.

Panel A shows the possible paths that can lead to higher capital structure adjustments in financial firms. Among these, path 3 shows the highest consistency (0.93) and coverage (0.69), indicating that, in the absence of both long and short credit ratings, the presence of all other factors except firm age strongly leads to capital structure adjustments. Only one path, i.e., the 4th, with the second-highest consistency (0.84), depicts a possibility where, in the presence of all factors, including credit rating, but excluding leverage, it helps determine the capital structure adjustments. Hence, according to both possibilities, larger firms with higher equity, debt, and their respective changes, can consistently achieve debt-focused capital structure changes. Paths 1, 2, 5, and 6 exhibit relatively low consistency and capture the absence of conditions leading to capital structure adjustments.

Panel B shows the possible configurations of conditions leading to capital structure adjustments in non-financial firms. All three paths show consistency above 0.90, implying that they are strongly sufficient. Firms with higher leverage, total debt, and changes in equity and debt (combined with the absence of credit ratings and lower dependence on structural maturity) exhibited higher capital structure adjustments. Therefore, in financial firms, capital structure changes stem from multiple conditions and are heterogeneous, whereas for non-financial firms, fewer conditions are required, showing managerial discretion.

4.4. Configurational Analysis

Table 6 shows the conditions acting as core and peripheral. This is based on parsimonious and intermediate solutions for both financial and non-financial firms.

Table 6: Core and peripheral conditions for the presence of capital structure adjustments

For CS	BRL	BRS	Size	Lev	Age	TE	TD	ΔDt	ΔEq
Core and peripheral conditions in financial firms									
1	⊗	⊗	⊗	⊗	•	•	⊗	⊗	
2	⊗	⊗	⊗	⊗	⊗	•	⊗	•	
3	⊗	⊗	•	⊗		⊗	⊗	•	⊗
4	⊗	⊗	•		⊗	⊗	⊗	•	⊗
5	⊗	⊗	⊗	⊗	•	•	⊗		⊗
6	⊗	⊗	⊗	⊗		•	⊗	•	⊗

For CS	BRL	BRS	Size	Lev	Age	TE	TD	ΔDt	ΔEq
Core and peripheral conditions in non-financial firms									
1	⊗	⊗		⊗		⊗	•	⊗	⊗
2	⊗	⊗		⊗	⊗		•	⊗	⊗
3	⊗	⊗	⊗	⊗		⊗	•	⊗	⊗

• = Core condition

⊗ = Peripheral condition

BRL = broad rating long, BRS = broad rating short, CS = capital structure, Lev = leverage, TD = total debt, TE = total equity, ΔDt = change in debt, ΔEq = change in equity.

Core conditions appear in both the parsimonious and intermediate solutions. On the other hand, all those conditions that only appear in the intermediate solution are termed as peripheral conditions. For the financial firms, ~age, *size, ~TE and *ΔDt, i.e., the absence of firm age and total equity, while presence of firm size and change in debt serve as the core conditions.

In the non-financial firms, only ~td (total debt) serves as the core condition. All others in both panels are peripheral conditions. This implies that the reconfiguration of capital structure is largely the result of capital structure decisions by financially dynamic companies that have the size to tap external capital and are ready to rebalance their capital structure with debt rather than equity. Larger financial institutions that are relatively young are the leading profile, with debt financing and utilization of existing equity resources growing proactively.

As one of the aspects covered by fsQCA is causal asymmetry, none of the conditions were found to be necessary (except for the total equity of non-financial firms) (Table 7). This means causal asymmetry exists because the factors driving capital structure adjustments did not drive the no-adjustment decisions.

Table 7: Necessary conditions for the absence of capital structure

Conditions for ~CS	Financial firms		Non-financial firms	
	Consistency	Coverage	Consistency	Coverage
Broad rating long	0.464219	0.860425	0.676888	0.74786
Broad rating short	0.299345	0.831979	0.430923	0.923237
Size	0.524088	0.710189	0.751775	0.487239
Leverage	0.632133	0.909336	0.879923	0.584853
Age	0.869621	0.779805	0.833441	0.526617

Conditions for ~CS	Financial firms		Non-financial firms	
	Consistency	Coverage	Consistency	Coverage
Total equity	0.808933	0.746278	0.939961	0.540159
Total debt	0.783793	0.690036	0.858296	0.335817
Change in debt	0.732811	0.906028	0.875081	0.549564
Change in equity	0.793849	0.858497	0.879922	0.521224

CS = capital structure.

In addition, the truth table analysis in Table 8 for non-adjustment decisions regarding capital structure shows that most configurations are sufficient. Causal asymmetry holds due to different recipes for adjustment and non-adjustment decisions. However, consistency in non-adjustment decisions is stronger, implying that they are more predictable. On the other hand, adjustment decisions are more complex as capital structure adjustments occur most of the time, but not always.

Table 8: Truth table for the absence of capital structure

For ~CS	BRL	BRS	Size	Lev	Age	TE	TD	ΔDt	ΔEq	Consistency	Coverage
Panel A: Financial firms											
1	~	~	~	~		~	~		~	1.000000	0.407390
2	~	~	~	~		~	~	~		1.000000	0.418147
3	~	~	~	~	*		~	~		1.000000	0.378157
4	~	~	~	~	*	*			*	1.000000	0.512359
5	~	~	*	*		*	*	*	*	0.909692	0.434635
6	*	*	*		*	*	*	*	*	0.847304	0.284846
7	~	~	~	~	*	~	~			1.000000	0.350444
8	~	~	~	~	*	~	~		*	1.000000	0.330682
Solution consistency: 0.933085; solution coverage: 0.818522.											
Frequency cutoff = 1; consistency cutoff = 0.83.											
Panel B: Non-financial firms											
1	~	~	~	*	*	*	~	*	*	1.000000	0.291801
Solution consistency: 1.000000; solution coverage: 0.291801.											
Frequency cutoff = 1; consistency cutoff = 1.											

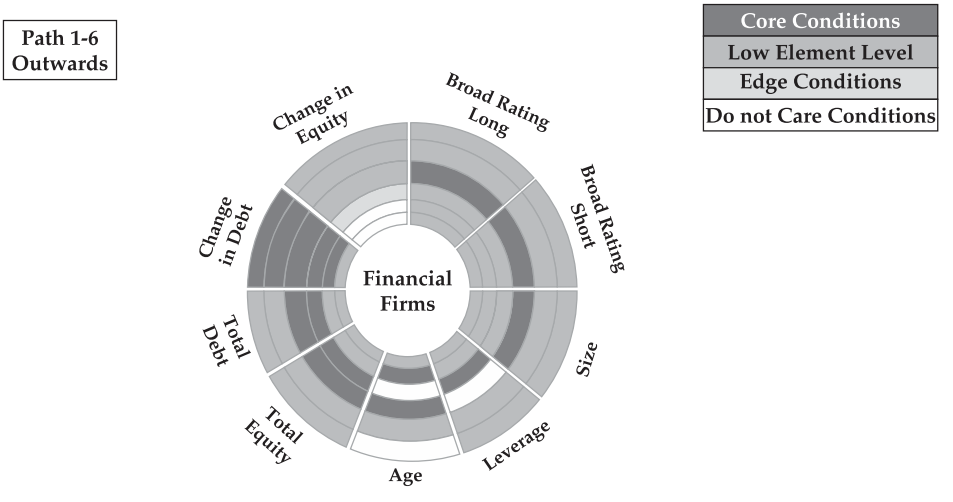
BRL = broad rating long, BRS = broad rating short, CS = capital structure, Lev = leverage, TD = total debt, TE = total equity, ΔDt = change in debt, ΔEq = change in equity.

Robustness tests are done by changing the calibration threshold to percentiles (Appendix: Table 9, Table 10, and Table 11) and other

thresholds applied to data with original calibrations by changing the consistency cut-off to 0.85 and frequency cut-off to 2 (Appendix: Table 12) to verify the consistency of findings. The results remained largely stable, as evident from overall solution consistency remaining above the threshold of 0.75 (Pappas & Woodside, 2021; Ragin, 2008).

The visual configurational analysis based on the truth table analysis highlights the presence (core), absence (low element level), and edge (rarely present last condition) conditions. Both figures align with the principles of causal complexity of fsQCA, highlighting that multiple conditions can lead to similar outcomes.

Figure 1: Configurational analysis based on intermediate solution (financial firms)

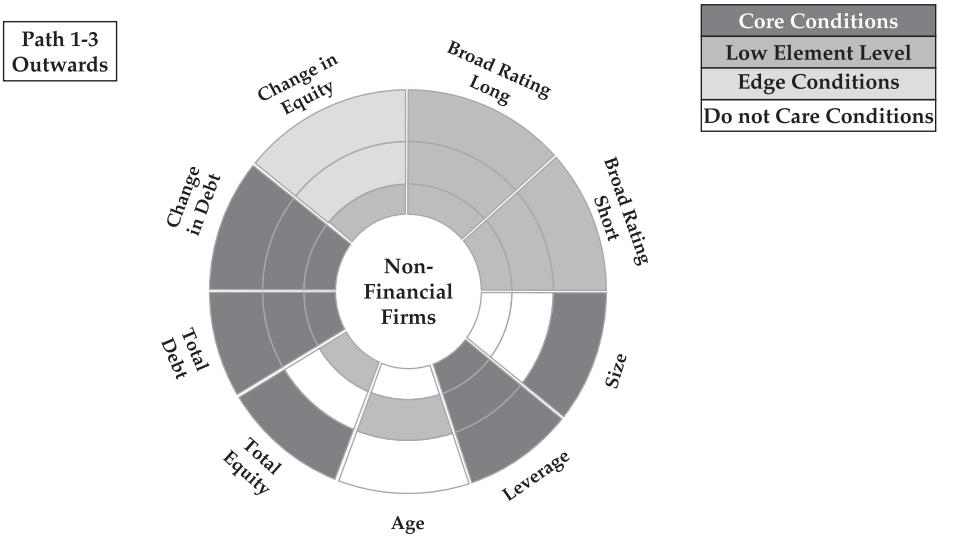


A condition is said to be core (in the context of visualization based on intermediate solution) if it is present (has high membership score) in the configuration. A condition is called low element level if it is absent in a configuration, i.e., has a low membership score. A condition is called an edge condition if it is only present in the intermediate solution and rarely occurs. A condition is classified as 'do not care' if it is not considered in a configuration.

Figure 1 depicts the configurations of conditions leading to capital structural adjustment in financial firms and is based on the intermediate solution. For each variable's configuration, its segment is divided into six paths and highlighted with colors representing present, absent, rare, and do-not-care conditions. Firm size, leverage, total debt, and equity remained structurally central. Change in equity serves as the edge condition in these

two paths, i.e., a rarely occurring condition that serves as a context-dependent enhancer but is not strictly required in other paths. The conditions presented in green highlight absence. Hence, their absence drives capital structure adjustments.

Figure 2: Configurational analysis based on intermediate solution (non-financial firms)



A condition is said to be core (in the context of visualization based on intermediate solution) if it is present (has high membership score) in the configuration and has strong causal importance. A condition is called low element level if it is absent in a configuration, i.e., has a low membership score. A condition is called an edge condition if it is only present in the intermediate solution and rarely occurs. A condition is classified as 'do not care' if it is not considered in a configuration.

Figure 2 presents the configurations of conditions leading to capital structure adjustments in non-financial firms and is based on the intermediate solution. For each variable's configuration, its segment is divided into six paths and highlighted with colors representing present, absent, rare, and do-not-care conditions. Leverage, total debt, and change in debt remained structurally central, while total equity and size appeared in some paths. Both credit ratings in all paths had a low element level, while the change in equity served as the edge condition in two of the paths.

4.5. Discussion of Findings

The causal relationship between capital structure adjustment, financial characteristics, and the credit ratings of financial and non-financial firms in Pakistan has been explored using a configurational approach. The results show wide variations by sector. Leverage, age, equity base, total debt, and financing changes were found to be necessary conditions for financial firms, suggesting that firms may not adjust their capital structures unless they have the balance sheet capacity and financing flexibility. In contrast, non-financial firms needed only total debt as a necessary condition, indicating lower structural constraints and higher flexibility for financing decisions.

The second step, i.e., the truth table analysis, also shows that no single pathway results in capital structure adjustments. Rather, several combinations of characteristics produce the same effect. The majority of configurations for financial firms were related to firm size, debt, equity, and financing changes, while those for non-financial firms were related to leverage and debt conditions. In most configurations, credit ratings did not feature as a critical factor or requirement for making an adjustment; instead, they generally emerged as secondary factors that were enabled rather than determined to make an adjustment.

These results contradict a large portion of the capital structure literature, which has previously been dominated by regression-based approaches, and reported that, on average, firm characteristics and credit ratings have significant direct impacts on financing decisions. In previous studies, it was found that firm size, age, leverage, and credit ratings play a significant role in shaping capital structure adjustment (D'Amato, 2020; Poursoleyman et al., 2023; Shahzad et al., 2021). Likewise, Kisgen (2006) asserts that credit rating plays a pivotal role in influencing financing decisions.

Divergence could be attributed to Pakistan's institutional features. First, the bond market is still not fully developed, so the use of public credit ratings in funding decisions could be limited.

Second, debt finance is predominantly bank-centered, with relationship lending and private information being more important than external ratings.

Third, financial firms have specific regulatory and capital requirements that are more important than rating assessments, making balance sheet characteristics more important.

These institutional characteristics make internal financial capacity and debt structure more relevant than external credit ratings. Furthermore, the configurational approach provides a means to understand interactions among conditions rather than isolated net effects. Consequently, factors that appear significant in the regression models might not directly reflect capital structure adjustments but rather interact with other factors in certain combinations.

The results lend support to a configurational perspective on capital structure decisions. The findings do not support the existence of a single prevailing theory. Rather, they indicate that aspects of the trade-off theory, pecking order theory, and agency theory operate concurrently, and the extent to which each prevails depends on the mixture of firm-specific factors. This suggests that there are several causal factors behind capital structure decisions, rather than universal mechanisms.

The study also helps the CR-CS literature in establishing that there is no universal constraint of credit ratings. While ratings can sometimes help provide information and help certain arrangements, they are not normally required as a precondition for the structure of capital. This also raises questions about the universal nature of the CR-CS proposition and the dependence of ratings impact on institutions, markets, and firms' financial attributes.

Generally, the results move the debate from a variance-based to a set-theoretic approach. It is noteworthy that firm size, leverage, debt, and equity must not be considered as separate factors affecting capital structure decisions. Instead, their impact is realized in certain arrangements that differ from sector to sector. This argument is further strengthened by the observed causal asymmetry, which shows that factors related to capital structure adjustment are not the inverse of factors related to non-

adjustment. In doing so, a configurational approach offers more sophisticated insights into financing decisions in emerging markets and uncovers more complex patterns that can be obscured in traditional regression analysis.

5. Conclusion

This study conducted a comparative analysis of financial and non-financial firms operating in Pakistan from 2019 to 2023 by examining the internal and external factors leading to their capital structure adjustment decisions. The lack of research investigating the causal complexity among these variables, the scarcity of research in emerging economies, and limited focus on comparative sectoral analysis served as the motivating factors for this study. It was found that financing decisions in emerging markets, especially Pakistan, depend on a combination of conditions rather than a single driver, making configurational approaches essential. Moreover, credit ratings act as peripheral conditions, i.e., the contextual amplifiers, while financial characteristics serve as the conditions.

This study extended the literature by providing a configurational logic instead of the net effects. This means that capital structure adjustment decisions are combinatory in nature and are not influenced by one factor at a time, as tested in regression studies. It contributes theoretically to the trade-off and pecking order theories by showing that their relevance depends on the type of firm (financial or non-financial) and institutional settings. Moreover, the findings do not highlight a dominant role of credit ratings; they underscore that credit ratings are context-dependent for such financing decisions. They shape financing decisions in conjunction with other conditions. Hence, the traditional view of credit ratings as a significant determinant is challenged. This study provided a new methodological lens by capturing causal asymmetry, complexity, and equifinality. Hence, it shifts the single-theory dominance to configurational logic and implies that capital structure theories are not universal; rather, they are context-dependent.

The findings of this research have distinct implications for stakeholders in financial and non-financial firms. The results indicate that financial regulators need to focus on multidimensional supervision that includes leverage, capitalization, and capital adjustments, as there is a

causal relationship of complicated causal interdependence between financial firms. On the other hand, managers of non-financial corporations are advised to focus on optimizing leverage, debt-servicing efficiency, and liquidity management when deciding on capital structure adjustment in unstable economic environments (Shahzad et al., 2021). In addition, using fsQCA as an auxiliary diagnostic method can assist regulators and rating agencies in identifying other causal factors behind strong credit performance so that they can have more flexible credit evaluation models. Lastly, policymakers should focus on expanding regulatory frameworks and institutional constraints rather than on ratings systems in emerging countries.

The study has a few limitations. First, the results are context-specific and, therefore, not generalizable beyond Pakistan. Future studies can utilize this framework to explore firms' capital structure adjustments in other economies. Moreover, cross-country comparative analyses can be conducted to examine whether the configurations differ across various institutional settings. This will widen the external validity of these fsQCA findings.

Second, the lack of available data and inclusion criteria led to fewer firms in the sample. In turn, this led to the third limitation regarding the methodological scope, i.e., one of the reasons fsQCA was employed was that it works well with smaller datasets.

Fourth, the current research may be subject to omitted variable bias as it is specifically designed to focus on institutional signals and structural financial positions rather than profitability-driven preferences. Even though the causal complexity of fsQCA ensures robustness to some extent, the exclusion of profitability, growth opportunities, ownership structures, etc., may limit the completeness of included configurations. But the model prioritized directly aligned factors, considering its requirement to include a theoretically bound and parsimonious set of conditions. Therefore, future studies can incorporate such factors to establish a more comprehensive framework for understanding capital structure adjustment dynamics.

Fifth, the credit ratings were obtained from PACRA, which is specific to Pakistani firms. Future research can incorporate global credit rating benchmarks for improved comparability.

Sixth, in financial decision-making, endogeneity and reverse heterogeneity concerns cannot be ruled out despite the use of a set-theoretic approach. Hence, future studies can integrate dynamic panel data techniques or structural equation modeling in addition to fsQCA to triangulate net effects with configurational results and provide causal inference and additional robustness.

Lastly, a potential limitation arises from the inclusion of changes in debt and equity in both the conditions and outcome variables. We ensure that this inclusion and the operationalization of capital structure adjustments are consistent with the literature and present the net adjustment ratio rather than individual components. However, we acknowledge the partial mechanical overlap. Despite this, we ensure that fsQCA is not algebraically identical or additive but is based on set membership and cross-case consistency. Thus, it does not constitute a strict tautological reasoning. In addition, this overlap does not invalidate the interpretations of the configurations. For careful analysis, we rely more on sufficiency analysis rather than on the necessary conditions. Future studies can address this by either employing a different operationalization or excluding such components to have better interpretability of the necessary conditions analysis.

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Appendix

Table 9: Calibration anchors for robust analysis

Panel A: Financial firms	**Full membership (0.90)**	**Crossover (0.5)**	**Full non-membership (0.20)**
Capital structure	1.051	0.845	0.748
Broad rating long	3	2	2
Broad rating short	3	2	1
Firm size	21.40	18.95	15.75
Leverage	23.10	12.72	4.82
Firm age	73.10	26.00	15.80
Total equity	108,124,346	13,902,071	1,124,034
Total debt	1,804,746,082	158,253,092	5,774,021
Change in debt	278,052,901	12,494,451	-9,735
Change in equity	14,893,337	688,797	0.00
Panel B: Non-financial firms	**Full membership (1)**	**Crossover (0.5)**	**Full non-membership (0)**
Capital structure	1.059	0.52	0.37
Broad rating long	3	2	2
Broad rating short	3	2	1
Firm size	20.10057651	18.14524398	17.08607771
Leverage	2.301262159	0.879287601	0.397794253
Firm age	68.1	33.5	19
Total equity	85883266.7	34046767.5	6575818
Total debt	543702784.1	34138945.28	4906341.8
Change in debt	26263736	1060061.5	-3933836.2
Change in equity	13512098.8	1769777.5	-712035.8

Upon changing the calibration technique from min-mean-max to 20-50-90 percentiles, the configurations in truth table analysis remained largely stable. Additionally, the consistency and coverage values displayed minimal changes, indicating the structural robustness of findings across different anchors. However, the previously necessary conditions turned out to be unnecessary. This is because they are highly calibration-sensitive and change upon distribution-sensitivity transformations.

Table 10: Necessary conditions analysis with new calibrations (percentiles)

Conditions	Financial firms		Non-financial firms	
	Consistency	Coverage	Consistency	Coverage
Broad rating long	0.21972	0.636681	0.4656590	0.858554
Broad rating short	0.603731	0.547552	0.775205	0.703472
Firm size	0.726183	0.791231	0.77731	0.818163
Leverage	0.896336	0.940971	0.825521	0.935806
Firm age	0.668754	0.598712	0.591161	0.735714
Total equity	0.748701	0.707149	0.625789	0.667687
Total debt	0.771352	0.750259	0.872967	0.842659
Change in debt	0.77575	0.721975	0.695428	0.768012
Change in equity	0.732445	0.674727	0.628467	0.641601

Table 11: Truth table analysis with new calibrations (percentiles)

For CS	BRL	BRS	Size	Lev	Age	TE	TD	ΔDt	ΔEq	Consistency	Coverage
Panel A: Financial firms											
1	~	*	~	*	~	~	~	~		0.991586	0.204131
2	~	*	~		~	~	~	*	~	0.837481	0.143504
3	~	~	*		*	*	*	*	~	0.866271	0.175217
4	~	~	*	*		*	*	*	*	0.914502	0.483145
Solution consistency: 0.8807; solution coverage: 0.6750. Frequency cutoff = 1; consistency cutoff = 0.81.											
Panel B: Non-financial firms											
1	~	~	*	~	*	*	*		*	0.80259	0.16568
2	~	~	*	~		*	*	*	*	0.82064	0.19169
3	~	~	~	*	*	*	~	*	*	0.81081	0.05739
Solution consistency: 0.76979; solution coverage: 0.20279. Frequency cutoff = 1; consistency cutoff = 0.81.											

BRL = broad rating long, BRS = broad rating short, CS = capital structure, Lev = leverage, TD = total debt, TE = total equity, ΔDt = change in debt, ΔEq = change in equity.

Table 12: Truth table analysis with new thresholds

For CS	BRL	BRS	Size	Lev	Age	TE	TD	ΔDt	ΔEq	Consistency	Coverage
Panel A: Financial firms											
1	*	*	*		*	*	*	*	*	0.84696	0.446953
2	~	~	~	~	~	~	~	*	~	0.87829	0.39207
3	~	~	~	~	~	~	~	~	*	0.87959	0.39152
5	~	~	*	*	*	*	*	*	*	0.93182	0.68741
Solution consistency: 0.8388; solution coverage: 0.8798. Frequency cutoff = 2; consistency cutoff = 0.8629.											
Panel B: Non-financial firms											
1	~	~	~	*		~	*	*	~	0.97291	0.45646
2	~	~	~	*	~	~	*	*		0.97346	0.46611
3	~	~	*	*		*	*	*	*	0.97978	0.62419
Solution consistency: 0.9493; solution coverage: 0.7069. Frequency cutoff = 3; consistency cutoff = 0.9683.											

Upon changing the frequency cut-off from 1 to 2 and consistency cut-off from 0.80 to 0.85 (applied to data with original calibrations), the configurations remained largely stable. Additionally, the consistency and coverage values displayed minimal changes, indicating the robustness of findings across different thresholds.

BRL = broad rating long, BRS = broad rating short, CS = capital structure, Lev = leverage, TD = total debt, TE = total equity, ΔDt = change in debt, ΔEq = change in equity.