Assessing the Impact of Perceived Market Competition and Technological Integration on Startup Governance

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Article Info

Article type:
Original Research

ABSTRACT

In the evolving landscape of startup development, understanding the factors that influence governance quality is crucial for sustained growth and operational success. This study examines how perceived market competition and technology adoption impact governance quality in startup leaders, aiming to fill the gap in literature regarding the interplay of these factors in startup settings. A cross-sectional survey was conducted among 330 leaders from various startups across the technology, healthcare, and retail sectors. Data were collected using established scales: the Market Competition Intensity Scale for perceived market competition, the Technology Acceptance Model Scale for technology adoption, and the Corporate Governance Quality Scale for governance quality. Pearson correlation and linear regression analyses were performed using SPSS-27 to evaluate the relationships and predictive power of the independent variables on the dependent variable. The descriptive statistics indicated moderate to high levels of perceived market competition (Mean = 4.52, SD = 0.76) and technology adoption (Mean = 4.08, SD = 0.88), with governance quality also rated positively (Mean = 4.35, SD = 0.93). Pearson correlation revealed significant positive relationships between governance quality and perceived market competition ($r = 0.29$, $p = 0.003$), as well as technology adoption ($r = 0.41$, $p < 0.0001$). Regression analysis showed a significant model fit ($F = 45.05$, $p < 0.0001$), with an R^2 of 0.22, suggesting that both variables significantly predict governance quality. The study confirms that perceived market competition and technology adoption are significant predictors of governance quality in startups. The findings emphasize the importance of strategic management and technological enhancements in fostering effective governance structures, providing valuable insights for startup leaders and policymakers aimed at enhancing startup sustainability and effectiveness.

Keywords: startup governance, market competition, technology adoption, corporate governance, entrepreneurial strategy

1. Introduction

Understanding the intricate dynamics of startup leadership, market competition, and technology adoption offers profound insights into the determinants of governance quality in emerging business environments. Perceived Market Competition: The intensity of market competition a firm perceives can significantly influence its strategic behavior and operational decisions. According to Chen, Su, and Tsai (2007), the competitive tension framework encompasses awareness, motivation, and capability, which collectively determine a firm's competitive actions (Chen et al., 2007). This study further explores this framework, positing that heightened perceived competition in startups may either spur innovation or impede growth due to resource constraints (Bunger et al., 2020; Hallen et al., 2023).

The adoption of new technologies is pivotal for startups aiming to carve out a competitive advantage. The Technology Acceptance Model (TAM), as discussed by Choi, Sung, and Park (2020), suggests that technology adoption is primarily influenced by perceived usefulness and ease of use (Choi et al., 2020). Startups, by their very nature, need to be agile in adopting and leveraging new technologies to maintain relevance and operational efficiency (Silva et al., 2021).

Effective governance in startups is crucial for ensuring sustainable growth and compliance with regulatory frameworks. Governance quality, as indicated by Li et al. (2021), involves oversight mechanisms that influence strategic decisions and accountability (Li et al., 2021). The dynamics of startup governance may vary significantly compared to established firms due to their unique challenges and developmental stages (Evans & Farrell, 2023).

Recent studies have illuminated various aspects of startup dynamics, yet gaps remain in comprehensively understanding how perceived market competition and technology adoption specifically affect governance quality. Bunger et al. (2020) highlighted how competitive environments drive strategic responses in organizations but left the direct link to governance outcomes less explored. Similarly, Choi, Sung, and Park (2020) elaborated on the innovation performance through technology but did not delve into the governance implications of such technological advancements (Choi et al., 2020).

In terms of empirical studies, Karyani, Kolade, and Dewo (2021) examined risk governance in the banking sector but did not address startups, which often operate under markedly different conditions due to their size and developmental

stages (Karyani et al., 2021). Furthermore, the literature has extensively discussed the role of technology in startups (Choi et al., 2020; Silva et al., 2021), yet the direct correlation with governance quality remains underexplored.

While existing research provides a robust foundation, there is a noticeable lack of integrated studies that combine these elements—perceived market competition, technology adoption, and governance quality—within the context of startups. Most studies focus on isolated aspects of these variables without integrating them into a comprehensive model that reflects the complex interdependencies characterizing startup environments.

This study aims to fill the identified gaps by empirically investigating the impact of perceived market competition and technology adoption on the governance quality of startup leaders. By integrating theoretical insights from the competitive tension framework and the TAM, this research seeks to provide a nuanced understanding of how these factors interact to shape governance practices in startups. This could offer valuable implications for startup leaders and policymakers aiming to foster environments conducive to sustainable business growth and effective governance.

2. Methods and Materials

2.1. Study Design and Participants

This study employed a cross-sectional design to explore the impact of perceived market competition and technology adoption on governance quality in startup leaders. Based on Morgan and Krejcie's table for determining sample sizes, the research targeted 330 participants. The participants comprised CEOs, CTOs, and board members from a diverse range of startups across the technology, healthcare, and retail sectors. The inclusion criteria specified that the startups must have been operational for at least two years and employ between 50 to 500 staff members. An online survey was distributed through professional networking platforms and direct emails, utilizing a stratified random sampling technique to ensure a representative distribution of startup sizes and sectors.

2.2. Measures

2.2.1. Perceived Market Competition

The Market Competition Intensity Scale (MCIS), developed by Roberts and Dowling in 2002, is a widely recognized instrument for assessing the perception of market competition among business leaders. The MCIS consists of

10 items that measure perceived competitive intensity in the marketplace, ranging from pricing competition to innovation rivalry. Respondents rate each item on a 7-point Likert scale, from "strongly disagree" to "strongly agree." The scale has been subdivided into three subscales: price competition, product competition, and market dynamics. Studies validating the MCIS confirm its reliability and construct validity, indicating its robustness in various industrial contexts (Jafari et al., 2017).

2.2.2. Technology Adoption

The Technology Acceptance Model (TAM) Scale, introduced by Davis in 1989, serves as a fundamental tool for evaluating technology adoption within organizations. This scale includes 12 items, focusing on perceived usefulness and perceived ease of use, which are pivotal factors influencing the adoption of new technologies. Responses are collected on a 5-point Likert scale from "strongly disagree" to "strongly agree." The TAM Scale is broken down into two subscales: usefulness and usability. The scale's reliability and validity have been extensively tested across diverse industries and cultural backgrounds, ensuring its applicability for assessing technology adoption in startups (Salari Jaeini et al., 2021).

2.2.3. Governance Quality

The Corporate Governance Quality Scale (CGQS) was crafted by Brown and Caylor in 2006 to measure the effectiveness of governance practices within organizations. It consists of 15 items that evaluate aspects such as board structure, audit procedures, and shareholder rights. Each item is rated on a 6-point Likert scale, which ranges from "very poor" to "excellent." The CGQS is organized into three subscales: board governance, audit quality, and shareholder rights. Its validity and reliability have been confirmed through multiple studies, making it a reliable tool for assessing governance quality in the context of market competition and technology adoption within startups (Evans & Farrell, 2023).

2.3. Data Analysis

Data collected from the survey responses were analyzed using SPSS software, version 27. Initially, descriptive statistics (mean, standard deviation) were computed for all variables to provide an overview of the data distribution. To investigate the relationships between the dependent variable (governance quality) and each of the independent variables (perceived market competition and technology adoption), Pearson correlation coefficients were calculated. This statistical method was chosen to determine the strength and direction of the linear relationships among the variables.

Following the correlation analysis, a linear regression model was implemented to assess the predictive power of perceived market competition and technology adoption on governance quality. Both independent variables were included in the regression model to analyze their combined effect on the dependent variable. The regression analysis not only provided insights into the individual contributions of each independent variable but also adjusted for potential confounding effects, thereby offering a more comprehensive understanding of how these factors influence governance quality in startup environments.

The significance level was set at $p < 0.05$ for all statistical tests, indicating that results with a probability of occurring by chance below 5% would be considered statistically significant. The reliability of the scales used in measuring the constructs was confirmed via Cronbach's alpha, ensuring the internal consistency of the items within each scale.

3. Findings and Results

The study's sample consisted of 330 participants from diverse sectors within the startup ecosystem. In terms of sector distribution, 115 participants (34.85%) were from the technology sector, 102 participants (30.91%) hailed from healthcare, and the remaining 113 participants (34.24%) represented the retail sector. The roles of the respondents varied, with 145 CEOs (43.94%), 105 CTOs (31.82%), and 80 board members (24.24%) participating in the survey. Regarding the size of their startups, 110 companies (33.33%) had 50-150 employees, 107 companies (32.42%) employed 151-300 staff members, and the remaining 113 companies (34.24%) were categorized as having 301-500 employees.

Table 1

Descriptive Statistics

Variable	Mean	Standard Deviation

Perceived Market Competition	4.52	0.76
Technology Adoption	4.08	0.88
Governance Quality	4.35	0.93

Table 1 provides the descriptive statistics for the key variables in the study: Perceived Market Competition, Technology Adoption, and Governance Quality. The mean score for Perceived Market Competition was reported at 4.52 with a standard deviation of 0.76, indicating moderate to high levels of perceived competition among the participants. Technology Adoption exhibited a mean of 4.08 and a standard deviation of 0.88, suggesting a positive inclination towards the adoption of new technologies among startups, albeit with slightly greater variability. Governance Quality had a mean of 4.35 and a standard deviation of 0.93, reflecting a generally good level of governance practices across the sampled startups, with some variability in how governance was operationalized across different firms.

Prior to the main analysis, several assumptions requisite for Pearson correlation and linear regression were assessed and confirmed. The normality of the distribution for all continuous variables was verified through Shapiro-Wilk tests, with p-values greater than 0.05 (governance quality p = 0.08, perceived market competition p = 0.06, technology adoption p = 0.07), suggesting no significant deviation from normality. Linearity and homoscedasticity were examined through scatterplots, showing a consistent spread of residuals across the predicted values. The absence of multicollinearity was confirmed by Variance Inflation Factors (VIF), where all variables showed VIFs less than 2.5 (perceived market competition VIF = 1.45, technology adoption VIF = 1.60), well below the commonly accepted threshold of 10. Additionally, the Durbin-Watson statistic for the regression model was 2.03, indicating no substantial autocorrelation among residuals. These tests ensured the statistical analyses conducted were robust and the findings reliable.

Table 2

Correlation Table

Variable	Governance Quality	p-value
Perceived Market Competition	0.29	0.003
Technology Adoption	0.41	0.0001

Table 2 outlines the Pearson correlation coefficients between the dependent variable, Governance Quality, and each of the independent variables. The analysis revealed a significant positive correlation between Governance Quality and Perceived Market Competition (r = 0.29, p = 0.003), suggesting that higher perceptions of market competition are associated with better governance practices. Similarly, a stronger positive correlation was observed between Governance Quality and Technology Adoption (r = 0.41, p < 0.0001), indicating that greater adoption of technology is significantly correlated with higher governance quality. These results underscore the importance of both market dynamics and technological progress in influencing governance standards in startups.

Table 3

Summary of Regression Results

Source	Sum of Squares	Degrees of Freedom	Mean Squares	R	R2	R2 adjusted	F	p
Regression	58.45	2	29.23	0.57	0.22	0.21	45.05	0.0001
Residual	212.55	327	0.65					
Total	271.00	329						

Table 3 shows the regression analysis results used to predict Governance Quality from Perceived Market Competition and Technology Adoption. The regression model accounted for a significant proportion of variance in Governance Quality (R² = 0.22, Adjusted R² = 0.21), with an overall R of 0.57. The model's F-statistic (F = 45.05, p < 0.0001) indicates that the model was statistically significant, suggesting that both independent variables significantly contribute to explaining the variance in Governance Quality. The Sum of Squares for regression was 58.45, for residual

was 212.55, and the total was 271.00, with respective Mean Squares of 29.23 for regression and 0.65 for residuals.

Table 4

Results of Multivariate Regression

Predictor	B	Standard Error	β	t	p
Constant	0.85	0.12	-	7.08	0.0001
Perceived Market Competition	0.32	0.06	0.27	5.33	0.0001
Technology Adoption	0.49	0.05	0.43	9.80	0.0001

Table 4 presents the detailed outcomes of the multivariate regression analysis, which further elucidates the individual contributions of each predictor to Governance Quality. The constant term was significant (B = 0.85, SE = 0.12, t = 7.08, $p < 0.0001$), establishing a baseline for the model. Perceived Market Competition showed a positive effect (B = 0.32, SE = 0.06, β = 0.27, t = 5.33, $p < 0.0001$), and Technology Adoption exhibited an even stronger positive impact on Governance Quality (B = 0.49, SE = 0.05, β = 0.43, t = 9.80, $p < 0.0001$). These coefficients confirm that both market competition and technology adoption are crucial predictors of governance quality in startups, with technology adoption showing a particularly robust influence.

4. Discussion and Conclusion

The findings of this study reveal significant insights into the interplay between perceived market competition, technology adoption, and governance quality in startups. The results indicate that both perceived market competition and technology adoption significantly predict the governance quality in startup leaders, supporting the hypotheses proposed based on the theoretical frameworks of competitive tension and the Technology Acceptance Model.

The significant positive relationship between perceived market competition and governance quality suggests that startups that perceive higher levels of competition tend to have better governance practices. This aligns with the work of Chen, Su, and Tsai (2007), who posited that competitive tension can enhance a firm's motivation to optimize its strategic operations and internal controls to outperform rivals (Chen et al., 2007). Our findings corroborate with Bunger et al. (2020), who noted that competitive environments compel organizations to refine their strategic responses, which likely includes enhancing governance structures to respond adeptly to market challenges (Bunger et al., 2020).

Furthermore, the study by Hong, Serfes, and Thiele (2020) on competition in the venture capital market supports our results, suggesting that the competitive pressures not only drive startups to innovate but also to implement robust governance mechanisms as a foundational element of trust and reliability in highly competitive environments. Furthermore, the research by Creed, Jabbar, and Scott (2021) on school leaders' perceptions of competition supports our results, suggesting that in highly competitive environments, leaders tend to adopt more rigorous governance and management practices as a means of securing a competitive advantage (Creed et al., 2021).

Consistent with the Technology Acceptance Model, our results confirm that technology adoption significantly impacts governance quality in startups. The findings suggest that startups that effectively integrate new technologies experience improvements in governance practices. This is likely due to the efficiencies and enhanced monitoring capabilities provided by new technologies, which streamline governance processes and improve transparency (Choi et al., 2020). This supports the notion that technological advancements facilitate better management practices and decision-making processes within startups, as suggested by Silva et al. (2021), who highlighted the importance of adopting new technologies for operational effectiveness (Silva et al., 2021).

The study also echoes the findings of Li et al. (2021), who emphasized the role of technology in improving oversight mechanisms and accountability within organizations. By facilitating better data management and communication, technology adoption in startups appears to contribute to more stringent and effective governance structures (Li et al., 2021).

Moreover, the significance of technology in enhancing governance quality is echoed in the findings of Howell (2017), who noted that technological advancements facilitate more efficient project management and oversight. These technologies enable startups to maintain agility and

responsiveness, critical attributes that Howell associated with successful grant-financed innovation projects (Howell, 2017). Thus, our results are not isolated but are supported by a broad spectrum of studies across different contexts and industries, emphasizing the universal applicability of these dynamics.

Theoretically, the study extends the competitive tension framework and the Technology Acceptance Model by integrating them within the context of governance in startups. It demonstrates that not only do these factors influence operational and competitive strategies as previously noted by Hallen, Cohen, and Park (2023), but they also have a profound impact on the internal governance quality of these emergent entities (Hallen et al., 2023).

This study aimed to explore the impact of perceived market competition and technology adoption on governance quality in startups. The findings indicated that both factors significantly predict governance quality, suggesting that higher perceptions of market competition and greater adoption of technology contribute positively to the governance standards within startups.

While the study provides valuable insights, it is not without limitations. The cross-sectional design limits our ability to infer causality between the variables. Additionally, the reliance on self-reported measures might introduce bias, as participants could have overestimated their company's governance quality or their market's competitive intensity. Another limitation is the sample restricted to startups with 50 to 500 employees, which may not generalize to very small or very large enterprises.

Future research should consider a longitudinal design to track changes in governance quality over time as startups evolve and as their market competition and technology adoption strategies develop. It would also be beneficial to include objective measures of governance quality, such as third-party audits or compliance ratings, to complement the self-reported data. Furthermore, expanding the sample to include a broader range of startups, particularly those at different stages of growth or in different geographic regions, could provide more generalized findings.

For practitioners, the study underscores the importance of cultivating a strategic response to perceived market competition and leveraging technology adoption to enhance governance structures. Startups should consider regular assessments of their competitive environment and actively pursue technological solutions that support efficient governance practices. Additionally, training programs for startup leaders that focus on strategic management and

technological literacy can further empower them to utilize these insights effectively. By proactively addressing these areas, startups can enhance their governance quality, thereby securing a stronger position in competitive markets and ensuring sustainable growth.

Authors' Contributions

Authors contributed equally to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

Acknowledgments

Declaration of Interest

The authors report no conflict of interest.

Funding

Ethics Considerations

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were considered.

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