

FinTech, Corporate Governance, and Firm Performance: Panel Evidence from Listed Financial Firms

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Article Details	Abstract
Received: 15 Feb 2024 Accepted: 16 March 2024 Published: 09 June 2024 ¹Dr. Marwa Bangash ²Huzaifa Ghafar Copyright @Author Corresponding Author: *Dr. Marwa Bangash	Financial technology (FinTech) is transforming the way banks, insurers and asset managers play the game, but it is not clear whether the massive investment in technology is rewarding the firms' performance and what role corporate governance is playing in converting the technology into returns. This study uses a balanced panel of 120 listed financial firms observed from 2015 to 2024 (1,200 firm-years). There is a relationship between a disclosure-based FinTech adoption index and a six-component governance index and return on assets (ROA), return on equity (ROE), and Tobin's Q, with system GMM as a robustness check. The governance quality is positively related to all three performance measures, as is the adoption of FinTech (one year behind). The governance moderation of the FinTech effect is also robust: a one-standard-deviation increase in governance is associated with roughly a third more of the ROA payoff from FinTech, with the moderation driven by independent boards, independent audit committees and separation of the CEO and chair, but not by the size of the board or its ownership structure. This outcome implies that value creation is limited to well-governed firms when it comes to FinTech.

Keywords: FinTech, corporate governance, firm performance, digital transformation, board independence, panel data

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INTRODUCTON:

Financial technology is revolutionizing the financial firms' acquisition of customers, pricing of risk, payment and cost control. The cost of many financial services has been reduced, and new competitors have entered the market, thanks to digital lending platforms, mobile payments, open application programming interfaces (APIs), machine-learning credit models, and distributed-ledger settlement (Philippon, 2016; Thakor, 2020). Incumbent banks, insurers and asset managers have responded with significant investments in their own digital capabilities and the pressing question for boards is whether or not that is a good thing.

Value does not exist in technology. FinTech projects require substantial and variable investments and generate new operational and cyber risks, as well as managerial decisions which are not fully verifiable by the shareholders. The returns that can be achieved from the outlays depend on the level of governance; with good governance, independent boards and audit committees can review projects and ensure that expenditure is producing the necessary returns and risk controls are being implemented; however, with poor governance, managers can make projects for owners to pay off at the owners' expense by following fashion technology. Research into FinTech has been focused on the impacts of FinTech at the market level, while research on governance generally has not looked at digital transformation as a context where governance is most relevant.

This paper does fill that gap. It poses three research questions:

- RQ1. Is there a relationship between the adoption of FinTech and the accounting and market performance of financial firms?
- RQ2. Is there a positive relationship between governance quality and performance?
- RQ3. Do governance mechanisms enhance the FinTech–performance link? What are the most important governance mechanisms?

The study makes three contributions. It combines the technology and governance fields in a single model, it measures the adoption of FinTech using four metrics and not a single one and it determines which governance mechanisms can pay off

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technology investments. The review of literature is found in Section 2, the hypotheses are presented in Section 3, the data and method in Section 4, the results in Section 5, implications, limitations and conclusions in Sections 6 to 8.

Theory development and literature review.

Advanced performance in the FinTech segment and the firm's performance.

For years, information-technology writers have wondered whether investments in tech pay off. Positive firm level returns from the investment in information systems were reported by Brynjolfsson and Hitt (1996) and Bharadwaj (2000) revealed that better information systems capability firms outperform in profit and cost performance. Philippon (2016) states that in finance FinTech can reduce the cost of financial intermediation and Thakor (2020) demonstrates that the impact of FinTech on incumbent firms is contingent on the adoption as well as the disruption of the former. Financial innovation increases fragility, in addition to growth and efficiency, cautions Beck et al., 2016. Thus, on average, the expected value of the relationship between the rate of adoption of FinTech and the performance of the firm is positive, and the relationship between these variables is significant but varies greatly by firm.

2.2 Corporate governance and firm performance:

In Agency Theory, Governance is discussed as the reason behind its importance. When the interests of managers and owners are different, owners monitor and incentivize managers to reduce waste (Jensen and Meckling 1976), and independent boards of directors are the primary internal means for separating management decisions from control (Fama & Jensen 1983). In practice, more robust shareholders have been shown to be correlated with higher valuations (Gompers et al., 2003), smaller boards and higher Tobin's Q (Yermack, 1996), and gender-diverse boards which monitor more harshly (Adams & Ferreira, 2009). Core et al. (1999) demonstrate that weak government is correlated with higher managerial rent-seeking and lower operating performance.

Properly integrating the two views.

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The resource based view sees valuable, hard-to-imitate capabilities as the source of lasting advantage (Barney, 1991), while the dynamic-capabilities theory emphasizes the skills of building and reconfiguring these capabilities as markets shift (Teece et al., 1997). FinTech capability fits both. Agency theory puts the missing piece in place: Capabilities generate value for owners when managers use them for owners' benefit. Thus, governance is not just a facilitator of performance but it should define the extent to which the technology payoff is realised for shareholders.

2.4 Research gap

The current research literature usually explores either FinTech or governance in isolation, and there is limited research into the interplay and the question of which governance mechanisms underpin it. Table 2 summarises the measurement of the variables in this study.

3. Hypothesis Development

The framework is shown in Figure 1. The expectation is that FinTech adoption will increase performance as it will reduce costs, enhance risk assessment and create new revenue, while governance quality will increase performance through better monitoring, and governance will strengthen the first relationship, as independent oversight will enhance the project selection and risk control.

Figure 1. The conceptual framework, the hypotheses H1-H3, were developed.

Figure 1. The conceptual framework suggests that the adoption of FinTech and governance each impact performance, while governance also serves to moderate the FinTech effect.

- H1. The use of FinTech has a positive impact on the performance of firms.
- H2. Governance quality has a positive effect on firm performance.
- H3. Governance quality positively moderates the effect of FinTech adoption on firm performance.
- H4. Oversight mechanisms, which include board independence, audit committee independence and separation of CEO and chair, play the major role in the

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moderating effect, not the structural characteristics such as board size and ownership dispersion.

4. Data and Methodology

4.1 Sample

The sample comprises 120 listed financial firms that have been continuously listed for at least 10 years since 2015 and have had complete annual reports for that period, resulting in a balanced panel of 1,200 firm-years. Commercial banks represent the biggest size group, as indicated in Table 1.

Table 1. Sample composition

Firms	Firm-years	Share (%)		Sub-sector
Commercial banks	48	480	40.0	
Insurance	26	260	21.7	
Gross domestic product amounted to 2000.The gross domestic product was 16.7.				
Payments and consumer finance	14	140	11.7	
Other diversified financials	12	120	10.0	
Total	120	1,200	100.0	

4.2 Variables

Adoption index for the FinTech constructed based on annual and sustainability reports. The four dimensions are each scored on a scale of 0 to 1 and coded in each report: digital channels and payments, data analytics and artificial intelligence, open APIs and cloud infrastructure, and distributed-ledger use. The four scores are averaged together to form the index. The governance index is the average of six dimensions, each rescaled to the 0–1 range: share of independent directors, share of independent audit-committee members, share of female board members, separation of the CEO and chair, moderate board size (7–11 members), and ownership dispersion (inverse of the stake of the top five shareholders). ROA, ROE and Tobin's Q are measures of performance and their definitions are given in Table 2.

Table 2. Variable definitions

Variable	Symbol	Definition
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The average of four 0–1 disclosure scores (digital channels and payments; analytics and AI; APIs and cloud; distributed ledger) is the FTI.

Governance quality is the average of the six 0–1 index components, which include board independence, audit-committee independence, female directors, the separation of the CEO and chair, board size, and ownership dispersion.

Return on assets (ROA): Net income / total assets (in %)

Return on equity ROE Net income / Book equity (in %)

Tobin's Q Q (Market capitalisation + book liabilities)/Book assets

Firm size Size Natural log of total assets

Leverage Lev Total liabilities / Total assets

Firm age, Age, Natural log of years since founding

4.3 Empirical model

The baseline model, estimated separately for each performance measure, is:

$$\text{Performance}(i,t) = \alpha(i) + \lambda(t) + \beta_1 \cdot \text{FTI}(i,t-1) + \beta_2 \cdot \text{CGI}(i,t) + \beta_3 \cdot [\text{FTI}(i,t-1) \times \text{CGI}(i,t)] + \gamma \cdot \text{Controls}(i,t) + \varepsilon(i,t)$$

The $\alpha(i)$ are fixed effects for firms and the $\lambda(t)$ are year fixed effects. To avoid reverse causality from more profitable firms having more technology, FinTech adoption is lagged one year. The indices are mean centred before the formation of the interaction (Aiken & West, 1991), so that β_1 represents the FinTech effect at the average level of governance and β_3 represents the interaction: the FinTech effect changing by level of governance. H1 predicts $\beta_1 > 0$, H2 predicts $\beta_2 > 0$ and H3 predicts $\beta_3 > 0$.

4.4 Estimation strategy

The research design is depicted in figure 2. Random effects are rejected by a Hausman (1978) test ($\chi^2 = 38.6$, $p < .001$) and so are estimated with fixed effects; the standard errors are clustered by firm to allow for serial correlation (Petersen, 2009). Estimates capture variation in the firm over time as they capture the stable differences between firms. Robustness is analysed using an alternative FinTech measure, exclusion of 2020, lagged governance and a new governance index.

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Lastly, the sample is divided by sub-sector and each of the governance components is re-estimated with the interaction to test H4.

Figure 2. Research design, 7 steps, 1 model and choice test.

Figure 2. Research design: Hausman test – prior to hypothesis testing and robustness checks, fixed-effects are selected.

5. Results

5.1 Descriptive statistics

The overall average for the firm is .42 on the FinTech index and .58 on the governance index, and there is a high level of variability for both of these (Table 3). Mean ROA is 1.12% and mean Tobin's Q is 1.18. There is a wide variation in governance practices: the average number of independent directors on boards is 58.4% and 22.5% of firm-years have the CEO and chair in the same position.

Table 3. Descriptive statistics

Half-life (days)	N	Mean	SD	Min	Max
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Panel A: major variables.

FinTech index (FTI)	1,200	.42	.21	.03	.93
Governance index (CGI)	1,200	.58	.16	.18	.95
ROA (%)	1,200	1.12	1.34	-3.80	4.90
ROE (%)	1,200	9.65	8.20	-21.50	29.80
Tobin's Q	1,200	1.18	.42	.52	3.10
Size (ln assets)	1,200	9.14	1.62	5.90	13.20
Leverage	1,200	.78	.14	.31	.97
Age (years)	1,200	31.4	17.6	3	112

Panel B: governance elements

Independent directors (%)	1,200	58.4	14.2	—	—
Independent audit committee (%)	1,200	82.0	17.5	—	—
Female directors (%)	1,200	17.3	11.8	—	—
CEO duality (% of firm-years)	1,200	22.5	—	—	—
Board size (members)	1,200	9.6	2.7	—	—
Top-five ownership (%)	1,200	41.6	18.9	—	—

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Bangash and Ghafar

As seen in Table 4, the time pattern for FinTech shows an increase of more than four times from .15 in 2015-16 to .70 in 2023-24, and governance shows a gradual increase. The robustness checks exclude 2020 because ROA fell to .91% in 2019–20 and has risen back to 1.26%.

Table 4. Calculate the mean values for periods.

Period	FinTech index	Governance index	ROA (%)	Tobin's Q
2015–16	.15	.50	1.07	1.10
2017–18	.27	.54	1.14	1.14
2019–20	.42	.58	.91	1.13
2021–22	.57	.62	1.24	1.24
2023–24	.70	.66	1.26	1.29

Pairwise correlations are reported in table 5. The relationship with the ROA is positive (0.31), with the ROE positive (0.27) and with the Tobin's Q positive (0.34), in the same way as the relationship with governance is positive (0.26), with the ROE positive (0.22) and with the Tobin's Q positive (0.29). There is moderate correlation among the two indices (0.36), and none of the variance inflation factors is above 1.6 and the mean is 1.31, so there is no concern of multicollinearity.

Table 5. Correlation matrix

Variable	1	2	3	4	5	6	7
1. FTI	1						
2. CGI	.36	1					
3. ROA	.31	.26	1				
4. ROE	.27	.22	.71	1			
5. Tobin's Q	.34	.29	.48	.39	1		
6. Size	.29	.21	.08	.10	.04	1	
7. Leverage	-.08	-.12	-.31	-.05	-.18	.33	1

Note: the plus or minus value of the correlation is significant at the 5% level at .06 or greater.

5.2 Main regression results

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Table 6 is used to support H1, H2 and H3 for all the three performance measures. The coefficient of lagged adoption of FinTech is .612 with $p < .01$, and is positive and significant for average governance. From an economic point of view, a one-standard-deviation increase in the FinTech index (.21) increases ROA by approximately .13 percentage points (about 11.5% of mean ROA) and Tobin's Q by .045. Governance quality is also positive (ROA: .884, $p < .05$), which would translate into an addition of approximately .14 points of ROA with a one SD improvement (of .16). There is a positive and significant relationship between interaction and governance quality in all the columns with an interaction payoff of 1.236 and a p-value of $< .01$. As to be expected, the higher the level of leverage, the lower the level of performance.

Table 6. Fixed-effects regressions of performance on FinTech adoption and governance.

Variable	(1) ROA	(2) ROE	(3) Tobin's Q
FTI (t-1)	.612*** (.141)	3.84*** (.96)	.214*** (.052)
CGI	.884** (.352)	4.61** (1.88)	.176** (.071)
FTI × CGI	1.236*** (.402)	7.12*** (2.31)	.341*** (.104)
Size	.187** (.079)	1.02** (.46)	-.021 (.018)
Leverage	-2.114*** (.512)	-6.35** (2.94)	-.318*** (.101)
Age (ln)	-.093 (.101)	-.58 (.64)	.012 (.027)
Firm and year effect (yes/no)	Yes	Yes	Yes
Observations	1,080	1,080	1,080
Within R ²	.31	.27	.34

Note: firm-clustered standard errors in parentheses; * $p < .10$, ** $p < .05$, *** $p < .01$. Indices are mean-centred.

5.3 Moderation by governance

Table 7 shows the conversion of the interaction to simple slopes. The ROA for firms with governance 1 standard deviation below the average is .414, the average is .612, and one standard deviation above the average is .810, which is 96% higher

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than for weakly governed firms. FinTech is useful to all groups but especially to well-governed ones – the gaps are 84% for ROE and 69% for Tobin's Q.

Table 7. Governance at different levels and its impact on the use of FinTech.

Governance level	ROA	ROE	Tobin's Q
Low (–1 SD)	.414**	2.70**	.159**
Average	.612***	3.84***	.214***
High (+1 SD)	.810***	4.98***	.269***
High relative to low	+96%	+84%	+69%

5.4 Robustness checks

The findings persist through all the possible alternatives (Table 8). Smaller but still significant coefficients are found in the system GMM where lagged performance is endogenous, and the AR(2) and Hansen tests ($p = .31$ and $.28$) fail to reject the model. Any of these alternative definitions of FinTech, which exclude 2020, exclude governance or exclude ownership concentration, imply a positive and significant interaction.

Table 8. Bivariate robustness checks (dependent variable ROA)

Time (t+1)	FTI (t–1)	CGI	FTI × CGI	Obs.
Baseline fixed effects		.612***	.884**	1,080
System GMM	.487***	.712**	1.052**	1,080
Digital-channels FinTech measure		.534***	.861**	1,080
Excluding 2020	.587***	.902**	1.189***	960
Lagged governance	.598***	.790**	1.164***	960
Governance excl. ownership	.605***	.741**	1.201***	1,080

5.5.1 Heterogeneity of stakeholders and management bodies.5.5.2 Governance mechanisms.

There are some variations in the payoff to the FinTech (Table 9). In payments and consumer finance (.934) and asset management (.871), technology is near to the core product, and is smallest in other diversified financials (.391) where interaction is not significant. Commercial banks and insurers lie in between, with significant interactions.

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Table 9. Sub-sector estimates (ROA, dependent variable)

Sub-sector	Firms	Obs.	FTI (t-1)	FTI × CGI	
Commercial banks	48	432	.548***	1.044**	
Insurance	26	234	.702***	1.318**	
Asset management and brokerage	20	180	.871***	1.502***	
Payments and consumer finance	14	126	.934***	1.690**	
Other diversified financials	12	108	.391*	.812	

Table 10 tests H4 by using one governance component, which is standardised, at a time. There is a strong relation with independent directors (.318), and a moderate relation with separation of CEO and chair (.246), as well as separation of independent audit committee (.274). Board size and ownership dispersion are not related, although female representation is weakly significant (.152, $p < .10$).

Table 10. This is the interaction between the adoption of FinTech and each individual governance component (dependent variable: ROA).

Total number of votes cast for the component	FTI × component	Std. error	Significance
Independent directors	.318***	.094	$p < .01$
Independent audit committee	.274**	.108	$p < .05$
CEO/chair separation	.246**	.101	$p < .05$
Female directors	.152*	.087	$p < .10$
Moderate board size	.071	.066	n.s.
Ownership dispersion	.062	.079	n.s.

5.6 Summary of hypotheses

Table 11. Hypothesis testing summary

The hypothesis will serve as the background. The hypothesis will be used as the background.

H1 FinTech raises performance $\beta = .612$ (ROA), 3.84 (ROE), .214 (Q), all $p < .01$

Supported

H2 Governance raises performance $\beta = .884$ (ROA), 4.61 (ROE), .176 (Q), all

$p < .05$ Supported

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H3 Governance moderates FinTech effect Interaction 1.236 (ROA), 7.12 (ROE), .341 (Q), all $p < .01$ Supported

H4: Oversight mechanisms foster moderation Independent directors, audit committee, separation of CEO and chairperson: strongest support Moderate support for the rest of the oversight mechanisms

6. Discussion

6.1 Interpretation of findings

The results answer the three research questions. RQ1 finds a positive correlation between the adoption of FinTech and accounting and market performance, a finding that aligns with the capability view, which suggests that digital resources have an impact on efficiency and decision making (Bharadwaj, 2000; Barney, 1991). As suggested by agency theory (Jensen & Meckling, 1976; Core et al., 1999), RQ2 is found to have an independent positive relationship with performance in the present study. RQ3 is a reinforcing question: The same technology investment results in nearly doubling of the ROA gain in firms with strong governance vs. weak governance.

We believe that the mechanism is the one shown in Figure 3. While FinTech can drive down costs of serving customers, enhance risk and data utilization, and generate new revenue, turning those channels into returns calls for selecting the right projects to invest in, managing cyber and model risk, and knowing when to abandon the bad ones. As per the separation of decision control from decision management (Fama & Jensen, 1983), the moderating effect focuses in the oversight mechanisms, rather than in board size or ownership dispersion.

Figure 3. How-To: Getting FinTech Value to Performance, 3 Channels & 1 Governance Condition

Figure 3. Adoption of FinTech to performance: three value channels are inferred, and the independent oversight enhances the conversion.

6.2 Implications

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For boards: Make FinTech a governance issue. The investment pays off with technology committees, independent expertise and regular reporting on digital spending and cyber risk.

For regulators, supervisory focus on digital transformation is most useful where oversight is lacking, as it is in this area where there will be less return on investment from technology, and potentially more risk.

For investors, governance scores can provide clues about which companies will do well with digital initiatives, and are thus warranted in valuation models designed for tech.

- Managers: the payoff varies by sub-sector, and digital investment should be done where technology is most core to the product.

Finally, the limitations and future research are discussed.

Several limitations apply. Finally, the FinTech index is founded on disclosures, which can be overstating or understating the level of capability, and lagging it is not enough to completely rule out endogeneity. The 120 listed firms surveyed do not include private and fintech-native firms and should not be considered representative of other markets. Quality of governance is slow moving and so the within-firm variation is limited. In the future, external instruments could be employed, for example regulatory shocks, text-based measure of digital strategy, cyber-risk outcomes as an additional aspect of performance, and cross-country comparison of governance regimes.

8. Conclusion

This study finds that listed financial firms improve their performance after they adopt FinTech and quality of governance contributes to improving performance directly and increases return on investment on FinTech directly. The effect is primarily through independent oversight – boards which look closely at digital strategy reap the benefits. Technology and governance are thus complements; investments in one are more valuable the better the other is.

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