

Organizational Boundaries and Stock Price Crash Risk: Evidence from Franchising Intensity

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Abstract

Using a comprehensive screening of all SEC Form 10-K filings available on EDGAR, we combine textual analysis with manual verification to construct a unique panel of U.S. public franchisors. Based on this dataset, we provide robust evidence of a U-shaped relationship between franchising intensity and firm-specific stock price crash risk. Specifically, crash risk declines markedly as firms move from low to moderate franchising intensity, but the reduction attenuates and partially reverses as reliance on franchising becomes high. This finding is consistent with incentive alignment perspective in agency theory: in the low-to-moderate intensity phase, introducing franchisees effectively delegates operational responsibilities and residual claims to the unit level. This structure enhances outlet-level self-monitoring and information production while reducing headquarters' direct exposure to tail risks in daily operations. Further heterogeneity tests show that the U-shaped relation is more pronounced in more financially opaque firms, with a larger risk reduction over the low-to-moderate range.

Keywords: Franchising Intensity; Stock Price Crash Risk; Financial Opacity; Incentive Alignment; Organizational Boundaries

1.Introduction

Franchising is a highly influential hybrid organizational form in modern business (Lafontaine & Kaufmann, 1994; Norton, 1988; Shane, 1996). Under a franchising arrangement, a firm, known as the franchisor, grants legally independent entrepreneurs, known as franchisees, the right to operate outlets using its brand, business format, and ongoing operating support in exchange for upfront fees and continuing royalties. Compared to a wholly company-owned model, franchising enables firms to leverage external capital and entrepreneurial spirit, facilitating rapid expansion under resource constraints (Martin, 1988). Among publicly listed firms, franchisors differ substantially in how they manage ownership structure within outlet networks (Combs & Ketchen Jr, 2003; Madanoglu et al., 2011). We capture this difference using franchising intensity, measured as the proportion of franchised outlets relative to total outlets. In this study, we examine the association between franchising intensity and future stock price crash risk.

The crash risk literature emphasizes that tail risk is often linked to the delayed revelation of adverse information and its subsequent concentrated release (Bleck & Liu, 2007; Hutton et al., 2009; Jin & Myers, 2006). Therefore, the organizational arrangements that govern how information is produced, transmitted, and verified are pivotal in determining the scope for bad news accumulation. Yet, while the literature on stock price crash risk has identified various financial characteristics (Habib et al., 2018; Kim et al., 2011) such as earnings management and executive traits (Kim et al., 2016) including overconfidence that facilitate bad news hoarding, limited attention has been paid to organizational boundaries as a fundamental determinant. Franchising provides a tractable boundary choice. It reallocates outlet-level

decision rights and information responsibility through contract, which can affect the observability and verifiability of operating conditions, with implications for tail risk.

Our central intuition is that the relation between franchising intensity and future crash risk need not be monotonic. Changes in organizational boundaries can generate governance benefits and information frictions at the same time, making a non-linear pattern plausible. Specifically, drawing on the incentive alignment perspective of agency theory (Gillis & Castrogiovanni, 2012; Michael, 1996; Peterson & Dant, 1990), we argue that in the early stages of franchising, introducing franchisees can mitigate crash risk through two channels. First, franchisees are residual claimants whose payoffs are tightly linked to outlet performance, which strengthens effort incentives and self-discipline at the unit level. If these incentives lead operational problems to be detected and addressed earlier, and to enter internal reporting channels more promptly, there is less scope for adverse operational news to remain embedded within the firm. Second, when company owned and franchised outlets coexist, the plural form (Bradach, 1997; Kidwell & Nygaard, 2011) provides a benchmark for cross outlet comparison that facilitates anomaly detection and verification, improving information verifiability. Under the bad news hoarding framework, these channels imply that moving from low to moderate franchising intensity can improve information production and verification, reducing the likelihood that negative news accumulates and is later released in a concentrated manner, thereby lowering subsequent crash risk.

However, as reliance on franchising increases, the monitoring cost hypothesis and the goal incongruence view suggest frictions that can offset earlier gains. Franchisors and franchisees may diverge in objectives related to outlet profitability, brand consistency, and compliance, and

enforcement is costly and imperfect (Lafontaine, 1992; Wang et al., 2020). As networks become more dispersed and information sources more fragmented, verification and coordination costs rise, making adverse signals more likely to be delayed or harder to validate promptly. In addition, greater organizational and ownership complexity can expand accounting discretion through franchise related fee structures and settlement arrangements (Crosno & Tong, 2018; Holmberg & Morgan, 2003; Kaufmann & Eroglu, 1999), which may increase the scope for earnings management and selective disclosure (Gim et al., 2019; Poretti et al., 2024), particularly when franchising reliance is high. Under the bad news hoarding framework, these frictions motivate a non-linear relation: governance and information benefits may operate over a range, but at higher reliance they can be constrained by complexity and information frictions that impede timely aggregation and disclosure of adverse news.

The information environment may further moderate these effects. The crash risk literature shows that adverse news is more likely to be withheld and later released in opaque firms (Bleck & Liu, 2007; Jin & Myers, 2006; Kothari et al., 2009). If franchising improves the information process at low to moderate intensity through stronger discipline and more verifiable signals, the marginal benefit may be larger in opaque firms. At higher intensity, opacity may also amplify the effect of monitoring frictions on persistent information gaps. Motivated by this logic, we test whether financial opacity systematically shifts the shape and strength of the relation between franchising intensity and future crash risk.

To examine this issue, we construct a sample of U.S. public franchisor firms from 2010 to 2023 by employing a combination of textual analysis and manual identification based on SEC 10-K filings (annual report). This process yields a panel of 76 franchisors and 674 firm-year

observations, which, to our knowledge, is among the largest datasets used in franchising-related capital market research. We measure franchising intensity using the proportion of franchisee-operated outlets to total outlets (FOR) and proxy for crash risk using the negative coefficient of skewness (NCSKEW) computed from firm-specific weekly returns over year $t + 1$, with down-to-up volatility (DUVOL) serving as a robustness proxy (Chen et al., 2001; Kim et al., 2011). Our empirical results reveal a robust U-shaped relationship between franchising intensity and future stock price crash risk. Crash risk declines sharply as firms move from low to moderate franchising reliance, while the decline does not continue and a rebound emerges as reliance becomes high. The pattern is robust to using an alternative crash risk proxy and to measuring reliance on non company-owned operations with a broader outlet based measure. Taken together, the evidence suggests that franchising as an organizational boundary choice can deliver governance and information benefits over a range, but these benefits can be constrained when higher reliance amplifies complexity and information frictions.

Furthermore, heterogeneity tests reveal that this non-linear relationship is significantly stronger in firms with higher financial opacity. Using the absolute value of discretionary accruals (DA) from the modified Jones model (Dechow et al., 1995; Hutton et al., 2009) as a proxy for financial opacity, we find that the U-shape is substantially more pronounced among more opaque firms. In particular, opaque firms exhibit a larger risk reduction when moving from low to moderate franchising intensity, and a more visible rebound at high reliance. This evidence supports our mechanism that the external monitoring provided by incentive alignment is more effective in compressing the space for bad news hoarding when the internal information environment is opaque.

Our study contributes in three ways. First, we extend the franchising literature beyond average performance to capital market tail risk, showing that organizational boundary choices matter for the distribution of outcomes rather than only their mean. Second, we provide a large and replicable outlet based measure of franchising reliance for U.S. public franchisors, which can support future work on franchising and capital market consequences. Third, we connect governance trade-off in franchise systems to the bad news hoarding mechanism emphasized in the crash risk literature, highlighting the information environment as a key condition shaping this trade off and its risk implications.

The remainder of the paper proceeds as follows. Section 2 reviews the related literature and develops the research hypotheses. Section 3 describes the sample selection and variable construction. Section 4 presents the empirical strategy and reports the main results regarding the U-shaped relationship. Section 5 provides robustness checks to validate the primary findings. Section 6 examines the underlying mechanism of financial opacity. Section 7 concludes.

2. Literature review and hypotheses

The organizational boundary question of how to configure outlet ownership has become a prominent topic in the literature (Brickley & Dark, 1987; Dant et al., 1992; Sorenson & Sørensen, 2001). Prior research offers systematic explanations for firms' adoption of franchising and their allocation between company-owned and franchised units, generally from two complementary perspectives: resource scarcity and governance efficiency (Combs & Ketchen Jr, 2003; Martin, 1988).

From a resource scarcity perspective, franchising is viewed as a means for firms to overcome constraints in capital and managerial attention and to scale their networks more rapidly. By leveraging franchisees' own capital and entrepreneurial effort, firms can enter new markets faster and build brand assets while resources are scarce (Carney & Gedajlovic, 1991; Norton, 1988). Importantly, the vertical franchisor–franchisee relationship involves not only operating standards and monitoring, but also financial contracting: evidence suggests that franchisors may constrain franchisees' financing capacity or leverage to reduce system-wide cash-flow risk and default exposure, thereby affecting the franchisor's own financing slack and leverage choice (de Jong et al., 2011).

From a governance-efficiency perspective, agency theory and transaction cost economics emphasize that, in geographically dispersed networks where headquarters cannot readily observe local effort, franchising mitigates moral hazard (e.g., shirking) by turning outlet managers into residual claimants, thereby enabling expansion with lower monitoring costs (Lafontaine, 1992; Lafontaine & Shaw, 2001; Michael, 1996). Even as resource constraints ease, franchising may persist because it provides high-powered incentives and helps protect brand standards. From a risk-sharing perspective, franchising is often framed as a risk-mitigation device: firms accelerate market coverage while shifting part of operating volatility and investment risk to franchisees. Yet this arrangement is not costless, as excessive reliance on franchisees may dilute control and intensify free-riding and coordination costs as boundaries extend outward (Burkle & Posselt, 2008).

Therefore, the choice of franchising intensity reflects an inherent cost benefit trade off which implies that the optimal franchising intensity likely represents an "interior solution" (Lafontaine

& Kaufmann, 1994; Norton, 1995), suggesting a non-linear rather than a simple linear relationship. Consistent with this logic, Hsu and Jang (2009) find an inverted U-shaped relationship between franchising intensity and Return on Assets (ROA) in the restaurant industry.

A key insight behind the plausibility of nonlinearity is that franchising simultaneously entails efficiency benefits and governance frictions, and these forces operate through information generation, transmission, and verification that jointly shape the firm's information environment. On the efficiency side, plural form can improve verifiability via cross-unit benchmarking. Bradach (1997) argues that maintaining distinct governance units provides an internal comparison set that helps headquarters detect deviations and recalibrate standards; related work highlights that such comparison strengthens constraints and improves support and coordination (Kidwell & Nygaard, 2011). Contract economics further clarifies that these governance effects do not arise mechanically from organizational form; rather, they are embedded in contractual provisions governing an ongoing relationship. Business-format franchise contracts typically combine an upfront franchise fee with ongoing royalties, accompanied by training, advertising, monitoring, and termination rights (Kaufmann & Dant, 2001; Mathewson & Winter, 1985). Ongoing royalties together with termination rights can serve as self-enforcing discipline, whereas shifting compensation excessively toward upfront fees may weaken the franchisor's long-term leverage over outlet performance and system quality (Klein, 1995). Royalty design is also shown to be endogenous to incentive alignment in dual distribution settings (Gallini & Lutz, 1992). In parallel, relational governance research emphasizes that trust, commitment, and information sharing can complement formal contracts,

fostering stable cooperation and smoother information flows (Croonen et al., 2025).

In contrast to the efficiency gains perspective, the literature focusing on friction emphasizes the endogenous conflicts inherent in franchising relationships and their informational consequences. Spinelli and Birley (1996) note that goal divergence between franchisors and franchisees frequently triggers recurring conflicts regarding pricing, promotion, standard enforcement, and expansion strategies. Furthermore, within price-related governance practices, Meiseberg and Perrigot (2020) find a systematic correlation between conflict and satisfaction. As conflicts and operational frictions escalate, information feedback loops are more likely to be subject to noise and selectivity, thereby increasing the costs for headquarters to verify frontline risks. Moreover, risks are not necessarily confined within legal boundaries; Antia et al. (2017) identify bankruptcy spillover effects within franchise systems, where the financial failure of franchised units can increase the headquarters' risk exposure through reputational and network linkages. Concurrently, the multifaceted nature of contract and fee structures increases the complexity of financial reporting and external interpretation, granting management greater discretion in disclosure—particularly in environments where the disclosure of earnings claims is already selective (Michael, 2009). Consequently, while the outward migration of organizational boundaries and contractual complexity do not inherently lead to manipulation, they heighten external verification costs and amplify information asymmetry, creating conditions for the delayed incorporation of bad news into stock prices. Additionally, the ambiguity of contractual terms and enforcement mechanisms influence dispute resolution pathways and the dynamics of transparency (Wang et al., 2020; Zheng et al., 2020)

While capital market research has begun to examine the financial consequences of franchising,

existing evidence focuses primarily on average performance and conventional risk metrics. Studies indicate that franchising firms may exhibit superior risk-adjusted stock performance, that franchising intensity is associated with credit risk evaluations such as credit ratings, and that unexpected changes in the proportion of franchised units trigger adjustments in stock returns and risk exposure (Hsu et al., 2017; Madanoglu et al., 2019; Madanoglu et al., 2011). These findings suggest markets price franchising arrangements, yet they provide limited insight into extreme tail outcomes. Integrating the crash-risk literature's bad-news hoarding and sudden release mechanism (Hutton et al., 2009; Jin & Myers, 2006), , we argue that franchising intensity serves as a crucial organizational boundary configuration that shapes information flows. Specifically, in the low-to-moderate intensity phase, franchising functions as a potent governance mechanism. By delegating operations to independent residual claimants, firms substitute subjective internal reporting with objectively verifiable market signals, thereby significantly enhancing frontline self-monitoring. Furthermore, the coexistence of company-owned and franchised units (the plural form) enables headquarters to leverage cross-unit benchmarking to triangulate operating conditions (Bradach, 1997). This structural transparency and enhanced verifiability strictly limit the management's ability to conceal bad news or smooth over unit-level failures for extended periods. However, this governance benefit is not infinite. As reliance on franchising becomes excessive, the escalating agency conflicts and monitoring complexity may eventually overwhelm these information benefits, creating a tipping point where bad news accumulation becomes easier again. Consequently, the net effect of franchising intensity on crash risk is theoretically expected to exhibit a non-monotonic relationship.

H1: Franchising intensity is U-shaped related to future stock price crash risk.

Moreover, the magnitude of this governance benefit and the curvature of the U-shape should depend on the firm's overall information environment. The crash-risk literature inextricably links bad-news hoarding to information opacity. In poorer information environments, internal monitoring mechanisms are often compromised, making it easier for managers to withhold negative information from pricing (Bleck & Liu, 2007). Empirically, we use absolute discretionary accruals (DA) to capture this firm-level financial reporting opacity (Becker et al., 1998; Davidson et al., 2005; Hribar & Craig Nichols, 2007). We posit that the marginal governance value of franchising is higher in opaque firms. When internal transparency is low, the external monitoring and benchmarking signals provided by franchisees serve as critical substitutes for weak internal controls. Consequently, the incremental improvement in the information environment caused by introducing franchisees is most significant where the environment was originally opaque. Therefore, we expect the initial decline in crash risk to be significantly steeper for opaque firms, as the introduction of franchising imposes a more binding constraint on the accumulation of adverse information.

H2: The U-shaped association between franchising intensity and future crash risk is stronger in firms with higher financial opacity, specifically by intensifying the risk-reducing effect in the low-to-moderate intensity phase.

3. Sample and research design

3.1 Sample and data source

We construct a comprehensive firm-year panel of U.S. public franchisors based on annual Form 10-K filings. Our initial universe comprises all 10-K filings for fiscal years 2010 to 2023 available on the SEC EDGAR system. After removing duplicate entries, the starting dataset

contains 114,146 non-redundant firm-year filings from 17,496 unique firms.

To identify potential franchisors, we employ a textual screening algorithm using uniform regular expressions. We scan the "Business" section of Item 1 for franchising-related terms, such as "franchise," "franchisor," "franchisee," and their variants. We retain filings where the term frequency exceeds five. This procedure yields 6,836 candidate firm-year observations across 849 firms. Crucially, as franchising terminology does not always imply an active franchising system, we conduct a manual review of all candidate filings to verify franchisor status. We classify a firm as a franchisor only if it operates a structured system where independent franchisees manage outlets under the firm's brand and standardized format. Furthermore, the firm must provide ongoing system-level support, including training, marketing, and operational monitoring. To ensure relevance to U.S. capital markets, we require at least one franchised outlet to be located within the United States. We exclude observations where references to franchising are generic, forward-looking, or pertain solely to licensing or distribution agreements absent a franchising structure. This rigorous verification process results in a confirmed panel of 1,309 franchisor firm-year observations representing 163 firms.

Next, we merge the verified franchisor firm-years with Compustat via the CIK–GVKEY link, dropping 78 observations without a valid Compustat match and leaving 1,231 firm-year observations from 151 firms. We then construct the key franchising intensity measure, FOR, defined as the proportion of franchisee-operated outlets relative to total outlets. Outlet counts are manually extracted from 10-K filings and cross-referenced with Franchise Disclosure Documents where necessary. We require sufficient disclosure to consistently calculate the franchising intensity ratio, a criterion that leads to the removal of 416 observations.

Finally, we merge the franchisor panel to stock return data to compute forward-looking crash risk measures. Following the literature, crash risk in year $t + 1$ is constructed from firm-specific weekly returns over the subsequent fiscal year. Accordingly, while franchising variables are measured through fiscal year 2023, computing crash risk for 2023 observations requires weekly stock returns through fiscal year 2024. We obtain weekly returns from CRSP and link Compustat GVKEY to CRSP PERMNO using the CRSP/Compustat Merged (CCM) link. This final merge drops 147 observations due to missing CRSP coverage or link failures, yielding the regression sample of 674 firm-year observations from 76 firms. Table 1 summarizes each filter and the corresponding sample attrition.

Table 1

Franchisor Sample Creation

Data Filters	Dropped	After- filter sample size	After- filter number of Firms
SEC 10-K filings 2010-2024		115,410	17,496
Remove duplicate firm-year filings	1,264	114,146	17,496
Screen filings with “franchise” frequency >5 & (FY2010-FY2023)	107,310	6,836	849
Manually verify franchisor status	5,527	1,309	163
Match filings to Compustat (CIK-GVKEY)	78	1,231	151
Identify firms with computable franchise ratio	416	821	95

Notes: Table 1 reports the impact of various data filters on the initial 10-K sample and Compustat/CRSP financial data

Due to limited availability of franchise data, prior studies on franchising typically rely on relatively small panels. For example, de Jong et al. (2011) identify 56 franchisors and 290 firm-year observations to study how franchisor–franchisee financing constraints relate to corporate leverage choices. Madanoglu et al. (2011) analyze 499 firm-years (213 franchising and 286 non-franchising firm-years) and document differences in risk-adjusted stock performance between franchising and non-franchising firms. Hsu et al. (2017) examine 73 franchisors and 342 firm-years and show that unexpected changes in franchising intensity are associated with stock returns and risk exposures. In contrast, we construct a multi-industry 2010–2023 panel by manually verifying franchisor status from SEC EDGAR Form 10-K filings and linking verified firm-years to Compustat/CRSP, yielding 76 franchisors and 674 firm-year observations with consistently measured franchising intensity and forward-looking crash-risk outcomes.

3.2 Measuring firm-specific crash risk

We measure crash risk in the subsequent fiscal year and use two standard weekly-return-based proxies. Our baseline regressions use $NCSKEW_{i,t+1}$, while robustness tests use $DUVOL_{i,t+1}$ (Chen et al., 2001). Both measures are constructed from firm-specific weekly return innovations to capture left-tail downside risk consistent with the bad-news hoarding mechanism. We first compound CRSP delisting-adjusted daily returns into weekly returns (week ending on Friday) and compute weekly excess returns:

$$ExRet_{i,w} = R_{i,w} - R_{f,w} \quad (1)$$

We then estimate, for each firm-year, an expanded market model with contemporaneous market excess returns and two leads and lags, and define the residual as the firm-specific weekly return innovation:

$$ExRet_{i,w} = \alpha_{i,t} + \sum_{k=-2}^2 \beta_{k,i,t} MKT_{w+k} + \varepsilon_{i,w} \quad (2)$$

where MKT denotes market excess returns (implemented using weekly *mktrf*) Leads and lags help mitigate nonsynchronous trading and related microstructure concerns. Using the residuals, we compute

$$W_{i,w} = \ln(1 + \varepsilon_{i,w}) \quad (3)$$

$$W_{i,w}^c = W_{i,w} - \bar{W}_{i,t} \quad (4)$$

and n be the number of valid weeks in fiscal year t . We compute

$$NCSKEW_{i,t} = - \frac{n_{i,t}(n_{i,t} - 1)^{3/2} \sum_{w \in t} (W_{i,w}^c)^3}{(n_{i,t} - 1)(n_{i,t} - 2) \left[\sum_{w \in t} (W_{i,w}^c)^2 \right]^{3/2}} \quad (5)$$

where larger values indicate a heavier left tail. For DUVOL, we split weeks into down and up weeks using $\bar{W}_{i,t}$ as the cutoff, compute the corresponding sample variances σ_{down}^2 and σ_{up}^2 , and define

$$DUVOL_{i,t} = \ln \left(\frac{\sigma_{down,i,t}^2}{\sigma_{up,i,t}^2} \right) \quad (6)$$

Consistent with our implementation, we require at least 26 valid weekly observations per firm-year, and for DUVOL we additionally require at least two down weeks and two up weeks to

ensure the variance estimates are well-defined.

3.3 Measuring franchising intensity

We define franchising intensity based on outlet ownership information disclosed in firms' Form 10-K filings. Using textual screening and manual reading of the outlet-count sections in Item 1 and related business descriptions, we identify whether a firm operates a franchising system in a given fiscal year and extract the number of company-owned and franchisee-operated outlets. While 10-K filings are the main data source, we also supplement outlet ownership counts using Franchise Disclosure Documents (FDDs) when 10-K disclosures are incomplete or presented only at a high level. Because a public firm may operate multiple brands under the same corporate parent, we measure franchising intensity at the firm level by aggregating outlet counts across all brands reported by the firm in fiscal year t . For example, when a parent company reports outlet ownership separately for brands such as Taco Bell, KFC, and Pizza Hut (e.g., Yum! Brands), we sum franchised outlets and total outlets across these brands and compute a single firm-year ratio.

Our primary measure is the franchisee-operated outlet ratio, denoted as $FOR_{i,t}$:

$$FOR_{i,t} = \frac{\text{FranchisedOutlets}_{i,t}}{\text{TotalOutlets}_{i,t}} \quad (7)$$

A higher $FOR_{i,t}$ indicates greater reliance on franchising. In the regressions, we use $FOR_{i,t}$ to predict crash-risk outcomes in fiscal year $t + 1$.

Because firms differ in geographic reporting scope, we align the numerator and denominator using a consistent outlet universe within each firm-year. When a firm's operations extend

beyond the United States and the 10-K reports global outlet counts (or separately reports U.S. and international counts), we construct $FOR_{i,t}$ using the global outlet universe. When a firm's outlet operations are confined to the United States and the disclosure provides only U.S. outlet counts, we construct $FOR_{i,t}$ using the U.S. outlet universe. This rule ensures that $FOR_{i,t}$ is computed from internally consistent disclosures and reflects the firm's boundary choice for the relevant operating scope in that fiscal year.

We also acknowledge that non-company-owned outlets may include arrangements that are economically similar to franchising but reported under different labels (e.g., licensing). To address potential classification differences in disclosures, we use the non-company-owned ratio $NCR_{i,t}$ as an alternative measure in robustness tests:

$$NCR_{i,t} = \frac{\text{NonCompanyOwnedOutlets}_{i,t}}{\text{TotalOutlets}_{i,t}} \quad (8)$$

includes all outlets not owned by the firm as reported in the 10-K, which typically covers franchised outlets as well as other externally operated units. Consistent results using $NCR_{i,t}$ would indicate that our findings capture the broader boundary shift toward external operators rather than being driven by reporting labels.

3.4 Research design

To test Hypothesis 1, we employ a two-way fixed effects regression model that relate franchising intensity to future stock price crash risk. Our baseline specification uses next-year crash risk $NCSKEW_{i,t+1}$ as the dependent variable to mitigate simultaneity concerns. The key explanatory variable is franchising intensity, measured by the franchised-outlet ratio $FOR_{i,t}$, and we include its squared term to capture potential non-linearity. The regression specification

is defined as follows:

$$NCSKEW_{i,t+1} = \alpha + \beta_1 FOR_{i,t} + \beta_2 FOR_{i,t}^2 + \gamma' X_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t}. \quad (9)$$

where μ_i and λ_t denote firm and fiscal-year fixed effects, $X_{i,t}$ represents the vector of control variables and standard errors are clustered at the firm level. A U-shaped relation implies $\beta_1 < 0$ and $\beta_2 > 0$. This pattern of coefficients would indicate that crash risk initially decreases and subsequently increases as franchising intensity rises.

To isolate the effect of franchising intensity and ensure the robustness of our results, we include a comprehensive set of control variables following the established framework of Chen et al. (2001), Hutton et al. (2009) and Kim et al. (2011). We categorize these controls into four primary dimensions based on their economic implications.

First, we control for stock market characteristics. Specifically, to capture the potential impact of heterogeneous investor beliefs on crash risk (Hong & Stein, 2003), we include detrended share turnover (DTURN). Given that high historical volatility and recent returns often precede price corrections, we incorporate stock return volatility (SIGMA) and mean weekly returns (RET) into the regression. Additionally, to account for the persistence of return asymmetry, we include the one-year lagged negative coefficient of skewness (NCSKEW).

Second, we control for firm fundamental characteristics (Andreou et al., 2021; Habib et al., 2018; Zhang, 2013). We include firm size (SIZE) to account for agency complexities associated with larger firms. To capture valuation risks linked to growth expectations, we control for the market-to-book ratio (MTB). We also control for financial leverage (LEV), as higher debt levels can amplify distress risk, and return on assets (ROA) to isolate the effect of operating

performance.

Third, we incorporate measures related to the information environment and financial constraints. Consistent with Hutton et al. (2009), firms with higher opacity are more prone to concealing bad news; thus, we control for financial opacity (DA), measured as the absolute value of discretionary accruals. Furthermore, following He and Ren (2023), we control for financial constraints using the SA Index, as constrained firms are incentivized to withhold negative information to preserve access to external capital.

Finally, considering the operational nature of franchising firms, we control for operational efficiency variables. Specifically, we include sales per employee (EMP_SALES) and the ratio of selling, general, and administrative expenses to sales (SGA_SALES) to reflect cost rigidity and operational efficiency. All continuous variables are winsorized at the 1st and 99th percentiles to mitigate the influence of outliers.

To test Hypothesis 2 whether information opacity moderates the non-linear relation between franchising intensity and future crash risk, we extend the baseline specification in which DA (financial opacity) is already included as a control. Specifically, building on Equation (9), which already includes FOR and FOR² (and controls for DA and other covariates), we further add the interaction terms FOR×DA and FOR²×DA to allow the slope and curvature of the U-shaped relation to vary with information opacity.

As a complementary test, we split the sample into high- and low-opacity groups based on the annual median of DA and re-estimate the same non-linear specification within each subsample.

4. Empirical results

Table 2 reports descriptive statistics and pairwise correlations (see Appendix A for definitions). Panel A shows 674 firm-year observations (642 for SGA_Sales). Franchising intensity is economically substantial: the mean (median) franchised-outlet ratio, FOR, is 0.617 (0.698), and the upper quartile reaches 0.949, indicating that a sizable share of observations operate with high reliance on franchised units. Crash-risk proxies display considerable dispersion and fat tails, consistent with the episodic nature of crash events.

Panel B indicates that $NCSKEW_{t+1}$ and $DUVOL_{t+1}$ are highly correlated (0.957) and show modest persistence via their lagged counterparts. Notably, the simple linear correlations between franchising intensity and next-year crash risk are small and statistically insignificant, a pattern that is not inconsistent with our theoretical prediction of a non-linear (U-shaped) relation. Accordingly, our subsequent multivariate analysis formally tests this prediction by including both FOR and FOR^2 in the baseline specification. We use FOR as our primary measure of franchising intensity and employ the broader-based NCR as an alternative proxy in robustness tests; our main conclusions are supported under both measures.

Table 2. Descriptive statistics and correlations.

<i>Panel A: Descriptive statistics</i>								
Variables	N	Mean	Std	P25	Median	P75	Min	Max
<i>Crash risk measures</i>								
$NCSKEW_{t+1}$	674	-0.065	0.944	-0.566	-0.113	0.389	-4.555	5.316
$DUVOL_{t+1}$	674	-0.076	0.801	-0.617	-0.133	0.422	-2.551	2.686

Franchisee intensity measures

FOR_t	674	0.617	0.335	0.295	0.698	0.949	0.025	1.000
NCR_t	674	0.645	0.344	0.307	0.799	0.971	0.015	1.000

Control variables

$DUVOL_t$	674	-0.074	0.756	-0.597	-0.123	0.414	-1.917	2.132
$NCSKEW_t$	674	-0.046	0.852	-0.539	-0.102	0.389	-2.559	3.132
$SIGMA_t$	674	0.046	0.026	0.029	0.039	0.056	0.014	0.230
$DTURN_t$	674	-0.007	0.161	-0.046	-0.002	0.038	-1.107	1.206
RET_t	674	0.003	0.008	-0.001	0.003	0.007	-0.032	0.036
DA_t	674	0.148	0.633	0.022	0.046	0.097	0.001	14.717
ROA_t	674	0.049	0.137	0.007	0.048	0.107	-1.275	0.402
$Size_t$	674	6.681	1.900	5.518	6.751	8.064	1.946	10.936
$Leverage_t$	674	0.548	0.562	0.208	0.425	0.709	0.000	3.892
MTB_t	674	3.041	3.871	1.284	1.942	3.257	0.415	53.449
SA_Index_t	674	-3.604	0.648	-4.125	-3.564	-3.137	-4.637	-1.715
Emp_Sales_t	674	0.012	0.009	0.004	0.010	0.018	0.001	0.044
SGA_Sales_t	642	0.185	0.145	0.102	0.138	0.216	0.016	1.349

Panel B: Correlations

	$DUVOL_{t+1}$	$NCSKEW_{t+1}$	FOR_t	NCR_t	$DUVOL_t$	$NCSKEW_t$	$SIGMA_t$	$DTURN_t$	RET_t	DA_t	ROA_t	$Size_t$	$Leverage_t$	MTB_t	SA_Index_t	Emp_Sales_t	SGA_Sales_t
$DUVOL_{t+1}$	1.000																
$NCSKEW_{t+1}$	0.957***	1.000															
FOR_t	-0.055	-0.045	1.000														
NCR_t	-0.051	-0.046	0.961***	1.000													
$DUVOL_t$	0.055	0.067*	-0.063	-0.068*	1.000												
$NCSKEW_t$	0.074*	0.086**	-0.066*	-0.074*	0.963***	1.000											
$SIGMA_t$	-0.099***	-0.108***	-0.211***	-0.255***	-0.106***	-0.095**	1.000										
$DTURN_t$	-0.063	-0.045	0.050	0.043	-0.028	-0.025	0.178***	1.000									
RET_t	-0.039	-0.049	0.096**	0.095**	-0.383***	-0.361***	0.112***	0.018	1.000								
DA_t	-0.033	-0.018	-0.056	-0.062	0.012	0.018	0.018	-0.078**	0.035	1.000							
ROA_t	0.076**	0.061	0.291***	0.279***	-0.034	-0.057	-0.450***	-0.055	0.254***	-0.011	1.000						
$Size_t$	0.150***	0.124***	0.018	0.078**	0.132***	0.110***	-0.351***	-0.026	0.015	-0.041	0.154***	1.000					
$Leverage_t$	0.009	0.002	0.380***	0.334***	0.003	-0.011	-0.085**	0.058	0.063	-0.029	0.356***	0.127***	1.000				
MTB_t	0.040	0.029	0.368***	0.338***	-0.023	-0.032	-0.159***	0.029	0.166***	0.013	0.448***	-0.168***	0.593***	1.000			
SA_Index_t	-0.048	-0.017	-0.016	-0.036	-0.045	-0.013	0.332***	-0.014	-0.000	0.044	-0.209***	-0.675***	-0.106***	0.157***	1.000		
Emp_Sales_t	-0.007	-0.013	-0.505***	-0.484***	0.014	0.016	-0.004	-0.034	-0.073*	-0.100***	-0.184***	-0.003	-0.321***	-0.248***	-0.101***	1.000	
SGA_Sales_t	0.053	0.075*	0.149***	0.109***	0.082**	0.108***	0.216***	0.018	-0.010	0.222***	-0.130***	-0.259***	0.012	0.188***	0.330***	-0.336***	1.000

Notes: This table presents descriptive statistics and correlations for stock price crash risk, franchising intensity, and control variables. The franchisor sample (Panel A) contains firm-years from 2010 to 2023 with non-missing values for all the control variables. The p-values are reported under the correlation coefficients in Panel B. Variables are defined in Appendix A. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 3 reports our baseline two-way fixed-effects regressions that relate franchising intensity in fiscal year t to next-year crash risk, measured by $NCSKEW_{t+1}$. The key regressors are FOR_t and FOR_t^2 , which allow for non-linearity; a U-shaped pattern corresponds to a negative coefficient on FOR_t and a positive coefficient on FOR_t^2 . Column (1) presents a parsimonious specification without fixed effects, while Column (2) introduces firm and year fixed effects. Columns (3)–(4) progressively add the standard set of crash-risk determinants and firm fundamentals, and Column (5) further controls for operating characteristics (with a smaller sample due to missing *SGA_Sales* and *Emp_Sales*). Across all specifications, the estimated coefficients consistently exhibit the predicted sign pattern: FOR_t is negative and statistically significant and FOR_t^2 is positive and statistically significant. Importantly, the magnitudes are stable once fixed effects and controls are introduced, suggesting that the non-linear relation is not driven solely by time-invariant firm heterogeneity or a particular set of covariates. Overall explanatory power increases as controls are added (R-squared rises from 0.019 in Column (1) to 0.279 in Column (5)), consistent with the empirical relevance of the standard crash-risk controls.

These robust statistical results provide strong empirical support for the U-shaped relationship between franchising intensity and crash risk. The significant negative coefficient on the linear term suggests that in the early stages of expansion, the delegation of operations to franchisees functions as an effective governance mechanism. Consistent with the incentive alignment perspective, independent franchisees generate objective performance signals that enhance frontline monitoring and constrain the ability of headquarters to conceal unit-level failures. However, the positive coefficient on the quadratic term indicates a reversal in this relationship. As franchising intensity surpasses a critical level, the governance benefits are outweighed by escalating monitoring costs and organizational complexity. This fragmentation increases

informational friction, which facilitates the accumulation of bad news and consequently heightens future crash risk.

Table 3. Baseline Regression Results: $NCSKEW_{t+1}$.

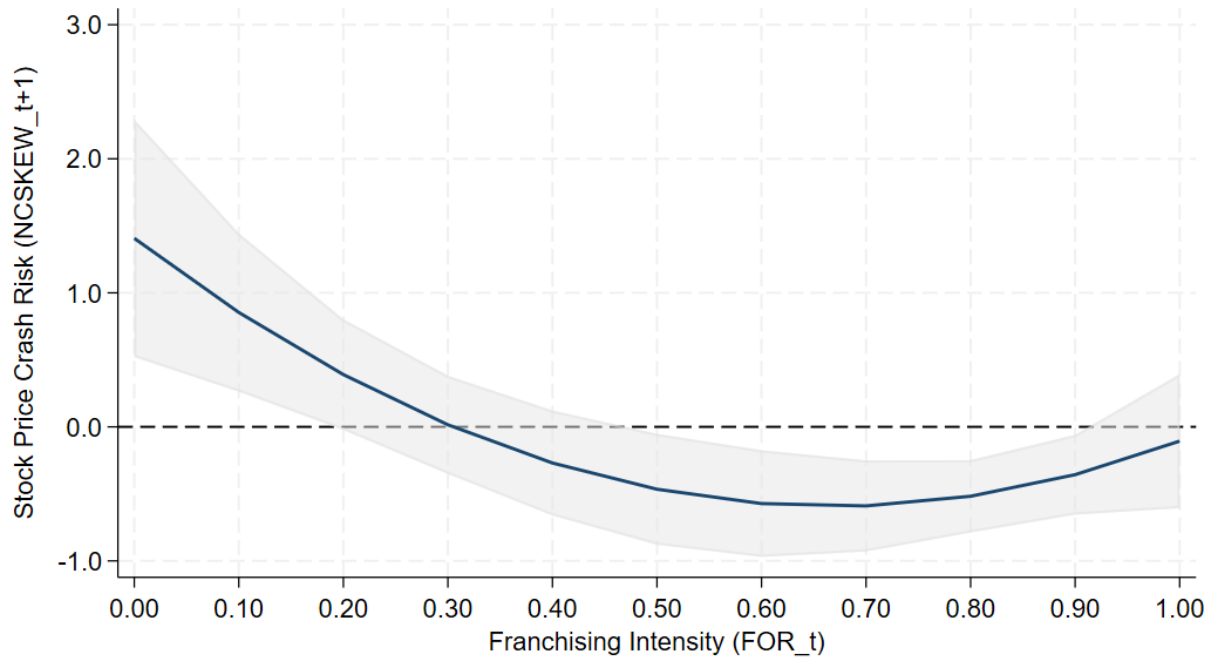
	(1)	(2)	(3)	(4)	(5)
FOR_t	-1.946*** (0.663)	-6.550*** (1.382)	-6.490*** (1.588)	-5.531*** (1.807)	-5.975*** (2.011)
FOR_t^2	1.618*** (0.593)	4.703*** (1.529)	4.654*** (1.614)	4.514** (1.722)	4.462** (1.773)
RET_t			3.537 (5.643)	-3.073 (5.508)	-3.837 (5.705)
$DTURN_t$			-0.068 (0.243)	-0.134 (0.228)	-0.012 (0.227)
$SIGMA_t$			-2.114 (3.218)	2.010 (3.488)	1.247 (3.469)
DA_t			-0.114*** (0.032)	-0.083*** (0.030)	-0.089*** (0.030)
$NCSKEW_t$			-0.100** (0.039)	-0.124*** (0.039)	-0.141*** (0.038)
$Size_t$				0.702*** (0.219)	0.734*** (0.229)
$Leverage_t$				-0.115 (0.169)	-0.062 (0.163)
ROA_t				0.612* (0.347)	0.818* (0.423)
MTB_t				0.052** (0.020)	0.052** (0.022)
SA_Index_t				0.427 (0.543)	0.698 (0.556)
SGA_Sales_t					1.279** (0.524)

Emp_Sales_t					7.211 (8.824)
_cons	0.339** (0.129)	1.660*** (0.302)	1.745*** (0.353)	-2.230 (1.471)	-1.479 (1.426)
Year Fixed Effect	NO	YES	YES	YES	YES
Firm Fixed Effect	NO	YES	YES	YES	YES
Obs.	674	674	674	674	641
R-sq	0.019	0.213	0.226	0.263	0.279

Notes: Table 3 presents the baseline regression results regarding the relationship between franchising intensity and future stock price crash risk. The dependent variable is the negative coefficient of skewness in year t+1 ($NCSKEW_{t+1}$). The values reported in parentheses represent robust standard errors clustered at the firm level. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

We also translate the quadratic estimates into predicted crash risk over the empirical support of franchising intensity. In the fully controlled specification, the implied turning point is $FOR \approx 0.67$, indicating that while increasing reliance on franchising is beneficial for risk reduction up to a point, the trade-off reverses when firms become heavily franchised.

Figure 1. Non-linear Effect of Franchising on Crash Risk



Notes: This figure plots fitted values of next-year crash risk ($NCSKEW_{t+1}$) against franchising intensity (FOR_t)

based on the two-way fixed-effects specification in Table 3, with firm and fiscal-year fixed effects and standard errors clustered at the firm level. Predicted values are computed using margins at $FOR = 0, 0.1, \dots, 1.0$; the shaded area denotes the corresponding confidence interval.

As illustrated in Figure 1, predicted crash risk falls sharply as firms move from very low to moderate franchising intensity, consistent with governance and information benefits at the margin when franchising is initially adopted. After the turning point, the fitted relation flattens over much of the remaining range, indicating weaker marginal effects in the full sample. An upward tendency appears only at the upper end of the intensity distribution, which is consistent with a boundary trade-off.

5. Robustness Checks

Building on the baseline evidence in Table 3 and Figure 1, we further examine the sensitivity of our findings to measurement choices and model specifications. Because crash risk is a tail-risk phenomenon and alternative proxies capture different aspects of the return distribution, inference based on a single measure may be affected by measurement error or proxy-specific construction. Following the prior literature, we conduct robustness checks along two dimensions: (i) replacing the crash-risk proxy and (ii) using an alternative measure of franchising intensity.

5.1 Alternative Crash-Risk Proxy

Table 4 validates our main findings using an alternative crash risk measure $DUVOL_{t+1}$. We retain the baseline fixed-effects specification. Consistently across all columns, the coefficient on FOR_t is negative and statistically significant, whereas the coefficient on FOR_t^2 is positive and statistically significant. This confirms that the U-shaped relationship is robust to the measurement of tail risk and remains stable against the progressive inclusion of market,

fundamental, and operating controls.

Table 4. Robustness Checks: Alternative Crash Risk Measure ($DUVOL_{t+1}$)

	(1)	(2)	(3)	(4)	(5)
FOR_t	-1.549*** (0.521)	-5.141*** (1.079)	-5.255*** (1.207)	-4.580*** (1.409)	-5.069*** (1.531)
FOR_t^2	1.260*** (0.472)	3.660*** (1.085)	3.727*** (1.147)	3.654*** (1.230)	3.790*** (1.305)
_cons	0.259*** (0.095)	1.293*** (0.248)	1.393*** (0.288)	-1.688 (1.244)	-1.059 (1.242)
Control Variables	NO	NO	SET 1	SET 2	SET 3
Year Fixed Effect	NO	YES	YES	YES	YES
Firm Fixed Effect	NO	YES	YES	YES	YES
Obs.	674	674	674	674	641
R-sq	0.017	0.205	0.225	0.261	0.271

Notes: Table 4 reports robustness regressions of next-year crash risk measured by $DUVOL_{t+1}$ on franchising intensity. The values reported in parentheses represent robust standard errors clustered at the firm level. Control sets. Set 1 includes crash-risk controls (RET, DTURN, SIGMA, DA, and $DUVOL_t$). Set 2 adds firm fundamentals (Size, Leverage, ROA, MTB, and SA_Index). Set 3 further adds operating controls (SGA_Sales and Emp_Sales). The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

The economic implications also remain consistent. The implied inflection point occurs at a franchising intensity of approximately 0.66, which falls well within the sample's interquartile range. This distribution confirms that the result represents a genuine economic trade-off. It suggests that while incentive alignment effectively reduces risk in the early stages of franchising, these governance benefits are eventually outweighed by the cumulative costs of organizational complexity as the network becomes extensive.

5.2 Alternative Measure of Franchising Intensity

The results in Table 5 are also consistent with the baseline evidence. Regardless of whether

crash risk is measured by $NCSKEW_{t+1}$ or $DUVOL_{t+1}$, the linear term in NCR_t is negative and statistically significant, while the squared term NCR_t^2 is positive and statistically significant, supporting a robust U-shaped association between non-company reliance and future crash risk. Importantly, this non-linear pattern remains stable in sign, significance, and magnitude after adding the same control structure as in the baseline analysis and controlling for contemporaneous crash risk. The implied turning point lies well within the empirical support of NCR_t and is close to the central part of the distribution, suggesting that the inference is not driven by extreme observations. Overall, these results indicate that our main conclusion does not depend on a narrow franchising-intensity definition.

Table 5: Robustness Checks: Alternative Franchising Intensity Measure (NCR_t)

	$NCSKEW_{t+1}$		$DUVOL_{t+1}$	
	(1)	(2)	(3)	(4)
NCR_t	-6.616*** (1.382)	-6.297*** (2.046)	-5.225*** (1.086)	-5.366*** (1.544)
NCR_t^2	4.705*** (1.538)	4.696*** (1.767)	3.710*** (1.090)	4.040*** (1.285)
_cons	1.688*** (0.328)	-1.403 (1.452)	1.312*** (0.264)	-1.026 (1.256)
Control Variables	NO	YES	NO	YES
Year Fixed Effect	YES	YES	YES	YES
Firm Fixed Effect	YES	YES	YES	YES
Obs.	674	641	674	641
R-sq	0.213	0.280	0.205	0.272

Notes: Table 5 reports robustness regressions that replace FOR_t with the broader-based non-company-owned outlet ratio NCR_t as the measure of franchising intensity. Columns (1)–(2) use $NCSKEW_{t+1}$ and Columns (3)–

(4) use $DUVOL_{t+1}$ as the dependent variable. All specifications include firm and fiscal-year fixed effects, and standard errors are clustered at the firm level. Variable definitions are provided in Appendix A. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Using the broader-based measure NCR_t , we continue to observe an almost identical turning point (in the fully controlled specifications, the turning point is about 0.67 for $NCSKEW_{t+1}$ and about 0.66 for $DUVOL_{t+1}$). This evidence indicates that our results are not specific to franchised outlets under a narrow definition, but extend to a broader notion of reliance on non company-owned outlets.

Overall, the baseline findings are robust to alternative crash-risk proxies and an alternative measure of organizational reliance, and the implied turning point consistently falls within an empirically relevant region of the distribution. In the next section, we examine whether financial opacity moderates this non-linear relation, providing sharper evidence on the role of the information environment.

6. Further Tests

This section further tests Hypothesis 2 (H2) that financial opacity strengthens the non-linear relation between franchising intensity and future crash risk. The intuition is that, in a more opaque information environment, the organizational boundaries and complexity associated with high franchising intensity may impede timely information aggregation and facilitate the delayed revelation of adverse operational news. We proxy financial opacity (DA) with the absolute value of discretionary accruals estimated using the modified Jones model (Dechow et al., 1995; Hutton et al., 2009). To preserve firm-year coverage, we use a one-year (current-year) DA measure rather than a rolling-window construction. Table 6 reports two complementary tests: split-sample regressions based on a sample-median split of DA (Panel A) and full-sample

interaction regressions that allow the quadratic relation to vary with High DA (Panel B). All specifications include the baseline controls, firm and year fixed effects, and standard errors clustered at the firm level.

Table 6. The Role of Financial Opacity

Panel A: Subsample Analysis based on DA				
	(1) High Opacity	(2) Low Opacity	(3) High Opacity	(4) Low Opacity
	$NCSKEW_{t+1}$		$DUVOL_{t+1}$	
FOR_t	-9.273*** (2.784)	-2.204 (2.133)	-7.202*** (2.127)	-2.186 (1.808)
FOR_t^2	6.970*** (2.132)	2.053 (1.918)	5.506*** (1.546)	1.938 (1.690)
_cons	-3.634 (2.379)	-2.443 (1.617)	-3.459* (1.782)	-1.799 (1.625)
Control Variables	Yes	Yes	Yes	Yes
Firm Fixed effect	Yes	Yes	Yes	Yes
Year Fixed effect	Yes	Yes	Yes	Yes
Obs.	311	315	311	315
R-sq	0.436	0.344	0.434	0.364

Panel B: Interaction Analysis using Full Sample		
	(1) $NCSKEW_{t+1}$	(2) $DUVOL_{t+1}$
FOR_t	-3.047 (1.989)	-2.656* (1.585)
FOR_t^2	1.702 (1.775)	1.513 (1.396)
High_DA	0.909*** (0.310)	0.749*** (0.282)
High_DA # FOR_t	-4.836*** (1.345)	-3.961*** (1.212)

High_DA # FOR_t^2	4.371 ^{***}	3.599 ^{***}
	(1.159)	(1.044)
Control Variables	Yes	Yes
Firm-Year Fixed effect	Yes	Yes
Obs.	641	641
R-sq	0.300	0.291

Notes: Panel A reports split-sample regressions by a sample-median split of DA (High DA = 1 if DA is above the sample median). Columns (1)–(2) use $NCSKEW_{t+1}$, and Columns (3)–(4) use $DUVOL_{t+1}$. Panel B reports interaction regressions with High DA $\times$ FOR_t and High DA $\times$ FOR_t^2 . All regressions include baseline controls and firm and year fixed effects; standard errors are clustered at the firm level. ***, **, and * denote significance at the 1%, 5%, and 10% levels.

Panel A of Table 6 reports split-sample regressions by financial opacity. In the high-opacity subsample, the linear term in franchising intensity is negative and statistically significant and the squared term is positive and statistically significant for both crash-risk proxies, indicating a pronounced non-linear relation. Importantly, the estimated pattern is driven primarily by the low-to-moderate range of franchising intensity, where predicted crash risk declines sharply, consistent with franchising providing larger governance and information benefits when internal transparency is weak. In contrast, in the low-opacity subsample, the corresponding coefficients are smaller in magnitude and statistically insignificant, suggesting a substantially flatter relation in more transparent environments.

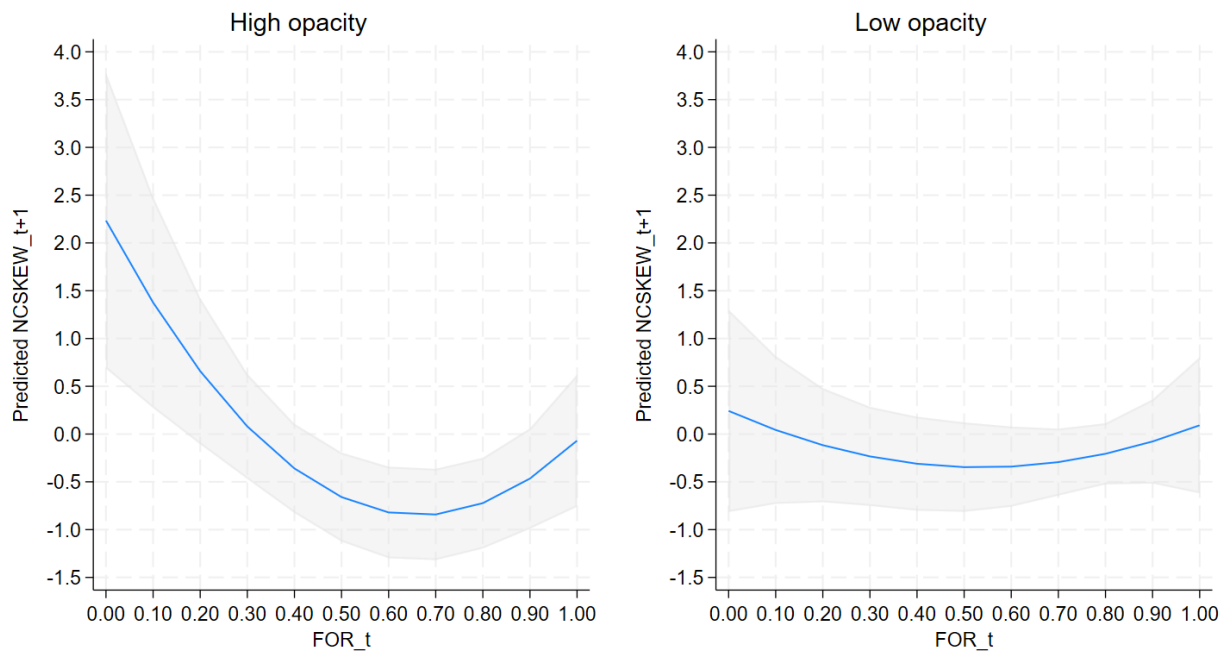
Panel B provides a formal moderation test using the full sample. The interaction between High DA and FOR_t is significantly negative, whereas the interaction between High DA and FOR_t^2 is significantly positive, and this pattern holds for both crash-risk proxies. This sign pattern implies that the fitted curve is more curved for high-opacity firms, relative to low-opacity firms. Consistent with H2, the moderation is most evident in a steeper decline in predicted crash risk as franchising moves from low toward moderate levels among opaque firms. The main effect

of High DA is also positive, indicating a higher level of crash risk in opaque environments.

Taken together, the split-sample and interaction results support the view that the information environment shapes the non-linear association between organizational reliance on franchising and subsequent tail risk.

The split-sample and interaction results in Table 6 jointly indicate that the non-linear association between franchising intensity and future crash risk is more pronounced in firms with poorer information environments, with the sharpest difference arising in the low-to-moderate franchising range. To make this heterogeneity more transparent, Figure 2 plots fitted relations separately for high- and low-opacity subsamples.

Figure 2. Subsample Analysis of Franchising Intensity and Crash Risk by Information Opacity



Notes: The figure plots fitted values of next-year crash risk measured by $NCSKEW_{t+1}$ from split-sample quadratic regressions estimated separately for high- and low-opacity firms, where opacity is proxied by DA and the split is based on the sample median. The solid line shows fitted values and the shaded area denotes 95% confidence intervals. All regressions include the baseline controls and absorb firm and year fixed effects, with standard errors clustered at the firm level.

Figure 2 shows that the fitted relation for high-opacity firms declines much more steeply when franchising intensity rises from low toward moderate levels, indicating a stronger association between early franchising adoption and lower subsequent tail risk in opaque environments. In contrast, the low-opacity group exhibits a flatter profile and economically smaller changes in predicted risk. This visualization aligns with Table 6 and supports our interpretation that, when transparency is weak, moderate increases in franchising may deliver larger incremental governance and verifiability gains, leaving less room for adverse information to remain trapped in internal reporting channels. Meanwhile, the high-opacity curve exhibits a more visible rebound at high levels of franchising intensity, consistent with a trade-off in which early governance and verifiability gains are gradually offset by rising complexity and monitoring frictions.

7. Conclusions

In this study, we examine the impact of organizational boundary choices on capital market tail risks, with a focus on the trade-off between incentive alignment and organizational complexity. Using a unique, manually verified panel of U.S. public franchisors, we document a robust U-shaped relationship between franchising intensity and future stock price crash risk. Our findings suggest that at low-to-moderate levels, the synergies of the plural form function as a dominant governance mechanism. By leveraging franchisee incentive alignment and utilizing company-owned units for cross-unit benchmarking, firms effectively enhance frontline monitoring and constrain the accumulation and concealment of bad news. However, as franchising intensity surpasses a critical threshold, this governance benefit is eventually outweighed by the combined forces of goal incongruence, monitoring complexity, and

informational fragmentation. These frictions create an environment conducive to withholding negative information, thereby facilitating bad news hoarding and delayed revelation, which leads to a significant escalation in crash risk. Further tests reveal that financial opacity significantly moderates this relationship: in opaque information environments, the marginal governance value of franchising is higher in the early stages, manifested as a steeper decline in crash risk.

The evidence is consistent with agency theory and the monitoring cost view of franchising. The decreasing segment at low to moderate intensity aligns with the incentive alignment argument that delegating residual claims to local operators can improve effort and information acquisition (Brickley & Dark, 1987). The increasing segment at high intensity is consistent with monitoring failure concerns that arise when headquarters loses visibility and control over outlet level fundamentals, which can aggravate free riding and goal incongruence (Lafontaine, 1992). Taken together, the results suggest that the governance benefits of franchising are not monotonic and can be offset when franchising becomes sufficiently extensive.

Beyond interpretation, our findings provide further empirical support for the ownership redirection hypothesis and life-cycle theory (Dant & Kaufmann, 2003). The results confirm that in the early stages, substantially increasing franchising intensity to facilitate rapid expansion is a beneficial strategy, as this resource-borrowing mode effectively mitigates operational risk. However, for mature systems, our findings also offer an economic rationale for ownership redirection through store repurchase or re-integration. Consistent with plural form theory, maintaining a mix of company-owned and franchised outlets serves vital governance and information functions (Bradach, 1997). From an information search

perspective, increasing company ownership can help the firm recover truthful operational signals and improve learning about local markets (Sorenson & Sørensen, 2001). In this sense, repurchasing is not merely an ownership change. It can be viewed as a risk mitigation response when extensive franchising and a weak information environment jointly increase the scope for delayed revelation of adverse operational news. By re integrating selected outlets, headquarters may reduce organizational complexity and weaken bad news hoarding incentives that are central in crash risk theories.

The study also has boundary conditions linked to data availability and the mechanism chain. Our evidence supports the interpretation that franchising can generate governance benefits within a certain range, but that these benefits may erode when high reliance on franchising constrains information feedback and monitoring execution, thereby increasing tail-risk exposure. Because public data do not directly quantify key elements of franchisor–franchisee relational governance and monitoring technology, we cannot disentangle whether the risk variation segment is primarily driven by contract enforcement and monitoring intensity, franchisor oversight investments, franchisee behavioral distortions, or heterogeneity in managerial capability and monitoring technology. Accordingly, we do not attempt to precisely decompose the relative contributions of these governance channels.

Future research could tighten the mechanism by building more direct measures of relational governance and managerial capability. Promising avenues include extracting contract and disclosure-based indicators from FDD materials and contractual texts, incorporating enforcement and dispute records and termination events, and measuring the adoption of monitoring technologies and internal control quality. Overall, this paper links a core

organizational form in retail and service industries to capital market tail risk, highlighting a non-monotonic association and the central role of the information environment in shaping when franchising reliance becomes a tail-risk concern.

Appendix A. Variable Definitions

Dependent Variable: Crash risk measures

DUVOL	Down-to-Up Volatility (DUVOL) is calculated over the fiscal year t . It is the natural logarithm of the ratio of the standard deviation of firm-specific weekly returns during "down" weeks (weeks with returns below the annual mean) to the standard deviation during "up" weeks. A higher value indicates higher crash risk.
NCSKEW	Negative Coefficient of Skewness (NCSKEW) is a measure of crash risk calculated over the fiscal year t . It is the negative of the third moment (skewness) of firm-specific weekly returns. Firm-specific returns are the residuals from the extended market model (including lead and lag market returns). A higher value implies a more negatively skewed distribution.

Independent Variable

FOR	Franchisee Outlet Ratio (FOR) measures franchising intensity as the share of franchisee-operated outlets among all outlets under the firm's brands in fiscal year t . $FOR = \text{Franchisee-operated outlets} / \text{Total outlets}$. Data: Outlet counts are hand-collected from Form 10-K (supplemented by FDD when necessary) and aggregated to the firm-year level across brands.
NCR	Non-Company-Owned Outlet Ratio (NCR) measures reliance on non-company outlets as the share of outlets not owned or directly operated by the firm (franchised + managed + licensed) among all outlets under the firm's brands in fiscal year t . $NCR = (\text{Franchised} + \text{Managed} + \text{Licensed outlets}) / \text{Total outlets}$. Data: Outlet counts are hand-collected from Form 10-K (supplemented by FDD when necessary) and aggregated to the firm-year level across brands.

Control Variable

Firm Size	Firm Size (Size) measures firm scale as the natural logarithm of total assets. $\text{Size} = \ln(AT)$.
MTB	Market-to-Book (MTB) measures valuation as market value of equity plus book assets minus book equity, scaled by book assets. $MTB = (PRCC_F \times$

$$\text{CSHO} + \text{AT} - \text{CEQ} / \text{AT}.$$

Leverage	Book Leverage measures leverage as total debt scaled by total assets. Leverage = $(\text{DLC} + \text{DLTT}) / \text{AT}$.
SG&A_Sales	SG&A Intensity (SG&A/Sales) measures operating expense intensity as SG&A expenses scaled by net sales; set to missing when sales are non-positive. $\text{SG\&A/Sales} = \text{XSGA} / \text{SALE}$ (missing if $\text{SALE} \leq 0$).
Emp_Sales	Labor Intensity (Employees/Sales) measures labor input intensity as number of employees scaled by net sales; set to missing when sales are non-positive. $\text{Employees/Sales} = \text{EMP} / \text{SALE}$ (missing if $\text{SALE} \leq 0$).
SIGMA	Idiosyncratic Volatility proxies for firm-specific risk. It is calculated as the standard deviation of the residuals from the extended market model regression estimated using weekly returns over the fiscal year t.
DTURN	Detrended Stock Turnover proxies for differences of opinion among investors. It is calculated as the average monthly share turnover in the current fiscal year t minus the average monthly share turnover in the prior fiscal year t-1. Monthly turnover is the ratio of trading volume to total shares outstanding.
RET	Mean Return controls for past performance. It is the arithmetic average of firm-specific weekly returns calculated over the fiscal year t
DA	Financial Opaqueness (or Earnings Management) measures information opacity. It is defined as the absolute value of discretionary accruals (Hutton et al., 2009).
SA_Index	SA_Index proxies financial constraints using the Hadlock and Pierce (2010) index based on size and age. $\text{SA} = -0.737 \cdot \ln(\text{Size}) + 0.043 \cdot [\ln(\text{Size})]^2 - 0.040 \cdot \text{FirmAge}$.

References

- Andreou, C. K., Andreou, P. C., & Lambertides, N. (2021). Financial distress risk and stock price crashes. *Journal of Corporate Finance*, 67, 101870.
- Antia, K. D., Mani, S., & Wathne, K. H. (2017). Franchisor–franchisee bankruptcy and the efficacy of franchisee governance. *Journal of Marketing Research*, 54(6), 952–967.
- Becker, C. L., DeFond, M. L., Jambalvo, J., & Subramanyam, K. (1998). The effect of audit quality on earnings management. *Contemporary accounting research*, 15(1), 1–24.
- Bleck, A., & Liu, X. (2007). Market transparency and the accounting regime. *Journal of accounting research*, 45(2), 229–256.
- Bradach, J. L. (1997). Using the plural form in the management of restaurant chains. *Administrative Science Quarterly*, 276–303.
- Brickley, J. A., & Dark, F. H. (1987). The choice of organizational form the case of franchising. *Journal of Financial Economics*, 18(2), 401–420.
- Burkle, T., & Posselt, T. (2008). Franchising as a plural system: A risk-based explanation☆. *Journal of Retailing*, 84(1), 39–47. <https://doi.org/10.1016/j.jretai.2008.01.004>
- Carney, M., & Gedajlovic, E. (1991). Vertical integration in franchise systems: Agency theory and resource explanations. *Strategic management journal*, 12(8), 607–629.
- Chen, J., Hong, H., & Stein, J. C. (2001). Forecasting crashes: Trading volume, past returns, and conditional skewness in stock prices. *Journal of Financial Economics*, 61(3), 345–381.
- Combs, J. G., & Ketchen Jr, D. J. (2003). Why do firms use franchising as an entrepreneurial strategy?: A meta-analysis. *Journal of Management*, 29(3), 443–465.
- Croonen, E. P., Broekhuizen, T. L., & Brand, M. J. (2025). Trust and control in franchise networks: A dyadic, multi-referent analysis on franchisee network exit intentions. *Entrepreneurship Theory and Practice*, 49(1), 129–158.
- Crosno, J. L., & Tong, P. Y. (2018). Just going through the motions? An empirical investigation of control, compliance, and performance in franchisor-franchisee relationships. *Journal of Business Research*, 92, 360–373.
- Dant, R. P., & Kaufmann, P. J. (2003). Structural and strategic dynamics in franchising. *Journal of Retailing*, 79(2), 63–75. [https://doi.org/https://doi.org/10.1016/S0022-4359\(03\)00011-3](https://doi.org/https://doi.org/10.1016/S0022-4359(03)00011-3)
- Dant, R. P., Kaufmann, P. J., & Paswan, A. K. (1992). Ownership redirection in franchised channels. *Journal of Public Policy & Marketing*, 11(1), 33–44.
- Davidson, R., Goodwin-Stewart, J., & Kent, P. (2005). Internal governance structures and earnings management. *Accounting & Finance*, 45(2), 241–267.
- de Jong, A., Jiang, T., & Verwijmeren, P. (2011). Strategic Debt in Vertical Relations: Evidence from Franchising. *Journal of Retailing*, 87(3), 381–392. <https://doi.org/10.1016/j.jretai.2010.12.002>
- Dechow, P. M., Sloan, R. G., & Sweeney, A. P. (1995). Detecting earnings management. *Accounting review*, 193–225.
- Gallini, N. T., & Lutz, N. A. (1992). Dual distribution and royalty fees in franchising. *JL Econ. & Org.*, 8, 471.

- Gillis, W., & Castrogiovanni, G. J. (2012). The franchising business model: an entrepreneurial growth alternative. *International Entrepreneurship and Management Journal*, 8(1), 75–98. <https://doi.org/10.1007/s11365-010-0158-8>
- Gim, J., Choi, K., & Jang, S. S. (2019). Do franchise firms manage their earnings more? Investigating the earnings management of restaurant firms. *International Journal of Hospitality Management*, 79, 70–77.
- Habib, A., Hasan, M. M., & Jiang, H. (2018). Stock price crash risk: review of the empirical literature. *Accounting & Finance*, 58, 211–251.
- Hadlock, C. J., & Pierce, J. R. (2010). New evidence on measuring financial constraints: Moving beyond the KZ index. *The review of financial studies*, 23(5), 1909–1940.
- He, G., & Ren, H. M. (2023). Are financially constrained firms susceptible to a stock price crash? *The European Journal of Finance*, 29(6), 612–637.
- Holmberg, S. R., & Morgan, K. B. (2003). Franchise turnover and failure: New research and perspectives. *Journal of Business Venturing*, 18(3), 403–418.
- Hong, H., & Stein, J. C. (2003). Differences of opinion, short-sales constraints, and market crashes. *The Review of Financial Studies*, 16(2), 487–525.
- Hribar, P., & Craig Nichols, D. (2007). The use of unsigned earnings quality measures in tests of earnings management. *Journal of accounting research*, 45(5), 1017–1053.
- Hsu, L.-T., & Jang, S. (2009). Effects of restaurant franchising: Does an optimal franchise proportion exist? *International Journal of Hospitality Management*, 28(2), 204–211. <https://doi.org/10.1016/j.ijhm.2008.07.002>
- Hsu, L., Kaufmann, P., & Srinivasan, S. (2017). How Do Franchise Ownership Structure and Strategic Investment Emphasis Influence Stock Returns and Risks? *Journal of Retailing*, 93(3), 350–368. <https://doi.org/10.1016/j.jretai.2017.04.004>
- Hutton, A. P., Marcus, A. J., & Tehranian, H. (2009). Opaque financial reports, R2, and crash risk. *Journal of Financial Economics*, 94(1), 67–86.
- Jin, L., & Myers, S. C. (2006). R2 around the world: New theory and new tests. *Journal of Financial Economics*, 79(2), 257–292.
- Kaufmann, P. J., & Dant, R. P. (2001). The pricing of franchise rights. *Journal of Retailing*, 77(4), 537–545.
- Kaufmann, P. J., & Eroglu, S. (1999). Standardization and adaptation in business format franchising. *Journal of Business Venturing*, 14(1), 69–85.
- Kidwell, R. E., & Nygaard, A. (2011). A strategic deviance perspective on the franchise form of organizing. *Entrepreneurship Theory and Practice*, 35(3), 467–482.
- Kim, J.-B., Li, Y., & Zhang, L. (2011). Corporate tax avoidance and stock price crash risk: Firm-level analysis. *Journal of Financial Economics*, 100(3), 639–662. <https://doi.org/10.1016/j.jfineco.2010.07.007>
- Kim, J.-B., Wang, Z., & Zhang, L. (2016). CEO Overconfidence and Stock Price Crash Risk. *Contemporary accounting research*, 33(4), 1720–1749. <https://doi.org/https://doi.org/10.1111/1911-3846.12217>
- Klein, B. (1995). The economics of franchise contracts. *Journal of Corporate Finance*, 2(1-2), 9–37.
- Kothari, S. P., Shu, S., & Wysocki, P. D. (2009). Do managers withhold bad news? *Journal of accounting research*, 47(1), 241–276.

- Lafontaine, F. (1992). Agency Theory and Franchising: Some Empirical Results. *The RAND Journal of Economics*, 23(2), 263–283. <https://doi.org/10.2307/2555988>
- Lafontaine, F., & Kaufmann, P. J. (1994). The evolution of ownership patterns in franchise systems. *Journal of Retailing*, 70(2), 97–113.
- Lafontaine, F., & Shaw, K. L. (2001). Targeting managerial control: evidence from franchising. In: National Bureau of Economic Research Cambridge, Mass., USA.
- Madanoglu, M., Castrogiovanni, G. J., & Kizildag, M. (2019). Franchising and firm risk among restaurants. *International Journal of Hospitality Management*, 83, 236–246. <https://doi.org/10.1016/j.ijhm.2018.10.021>
- Madanoglu, M., Lee, K., & Castrogiovanni, G. J. (2011). Franchising and firm financial performance among U.S. restaurants. *Journal of Retailing*, 87(3), 406–417. <https://doi.org/10.1016/j.jretai.2011.02.003>
- Martin, R. E. (1988). Franchising and risk management. *The American Economic Review*, 954–968.
- Mathewson, G. F., & Winter, R. A. (1985). The economics of franchise contracts. *The Journal of Law and Economics*, 28(3), 503–526.
- Meiseberg, B., & Perrigot, R. (2020). Pricing-based practices, conflicts and performance in franchising. *European Management Journal*, 38(6), 939–955.
- Michael, S. C. (1996). To franchise or not to franchise: An analysis of decision rights and organizational form shares. *Journal of Business Venturing*, 11(1), 57–71. [https://doi.org/https://doi.org/10.1016/0883-9026\(95\)00088-7](https://doi.org/https://doi.org/10.1016/0883-9026(95)00088-7)
- Michael, S. C. (2009). Entrepreneurial signaling to attract resources: the case of franchising. *Managerial and Decision Economics*, 30(6), 405–422.
- Norton, S. W. (1988). An Empirical Look at Franchising as an Organizational Form. *The Journal of Business*, 61(2), 197–218.
- Norton, S. W. (1995). Is franchising a capital structure issue? *Journal of Corporate Finance*, 2(1-2), 75–101.
- Peterson, A., & Dant, R. P. (1990). Perceived advantages of the franchise option from the franchisee perspective: Empirical insights from a service franchise. *Journal of Small Business Management*, 28(3), 46.
- Poretti, C., Jérôme, T., & Das, P. (2024). Plural form business strategy and financial reporting quality in hospitality firms. *Journal of Hospitality and Tourism Management*, 59, 60–69. <https://doi.org/https://doi.org/10.1016/j.jhtm.2024.03.008>
- Shane, S. A. (1996). Hybrid Organizational Arrangements and Their Implications for Firm Growth and Survival: A Study of New Franchisors. *The Academy of Management Journal*, 39(1), 216–234. <https://doi.org/10.2307/256637>
- Sorenson, O., & Sørensen, J. B. (2001). Finding the right mix: Franchising, organizational learning, and chain performance. *Strategic management journal*, 22(6-7), 713–724.
- Spinelli, S., & Birley, S. (1996). Toward a theory of conflict in the franchise system. *Journal of Business Venturing*, 11(5), 329–342.
- Wang, J. J., Grünhagen, M., Ji, L., & Zheng, X. (2020). Conflict Aftermath: Dispute Resolution and Financial Performance in Franchising. *Journal of Retailing*, 96(4), 548–562. <https://doi.org/10.1016/j.jretai.2020.03.001>
- Zhang, X.-J. (2013). Book-to-market ratio and skewness of stock returns. *The Accounting*

Review, 88(6), 2213–2240.

Zheng, X., Griffith, D. A., Ge, L., & Benoliel, U. (2020). Effects of contract ambiguity in interorganizational governance. *Journal of Marketing*, 84(4), 147–167.