Drinking Culture, State Ownership, and Corporate Capital Structure

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Abstract

This paper examines how informal social norms shape corporate leverage decisions. Using firm-level exposure to local drinking culture in China—measured by the density of alcohol-related points of interest around corporate headquarters—we show that stronger drinking culture causally reduces leverage among state-owned enterprises (SOEs). The effect is robust to extensive sample restrictions and alternative measures. To address endogeneity concerns, we implement an instrumental variable strategy based on agro-climatic suitability for sorghum cultivation interacted with global commodity price shocks, which confirms the causal interpretation. Mechanism analyses indicate that deleveraging reflects demand-side precautionary balance-sheet adjustments: SOEs reduce net debt issuance and increase cash holdings without cutting investment. The effect is stronger in regions with weaker formal institutions, consistent with institutional substitution. Overall, the findings demonstrate that informal cultural environments interact with ownership and governance structures to shape corporate financial policy.

Keywords: Drinking culture; Informal institutions; Corporate leverage; State ownership; Institutional quality

JEL Codes: G32, G38, P26, O17

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1 Introduction

Capital structure decisions are central to corporate risk management and long-term firm performance. A vast literature documents that leverage choices are shaped by firm fundamentals such as profitability, asset tangibility, growth opportunities, and tax considerations (Modigliani and Miller, 1958; Myers, 1984; Rajan and Zingales, 1995; Frank and Goyal, 2009), as well as by institutional factors including financial development, legal enforcement, and regulatory policy (La Porta et al., 1997; Demirgüç-Kunt and Maksimovic, 1999; Fan et al., 2012). While formal institutions—laws, financial markets, and regulatory frameworks—have long been recognised as key determinants of capital structure, an expanding body of research highlights that firms also operate within informal institutional environments, where social norms, cultural practices, and relational expectations influence economic behaviour (North, 1990; Williamson, 2000; Guiso et al., 2006).

Informal institutions shape economic outcomes by structuring interactions that occur outside formal contractual settings. Cultural norms influence trust formation, reciprocity, and perceptions of reputational risk, thereby affecting corporate decisions in economically meaningful ways (Tabellini, 2010; Ahern et al., 2015). Among various cultural dimensions, drinking culture occupies a distinctive position in China's social and business landscape. Alcohol-centred social interactions are closely intertwined with guanxi-based relationship networks that facilitate trust building, coordination, and resource exchange (Bian, 1997; Yang, 2016). Business banquets and drinking occasions often function as venues for reinforcing informal ties and signalling commitment. As such, drinking culture provides a concrete channel through which informal norms may intersect with firms' financial policies.

Recent research shows that drinking culture affects managerial networks, access to trade credit, and governance practices (Wang et al., 2023; Zhang et al., 2025; Li et al., 2025). For example, stronger drinking culture is associated with denser CEO social connections and enhanced relationship-based financing, particularly in regions where formal institutions are less developed. At the same time, relationship-based interactions may also exacerbate agency problems or weaken formal monitoring (Li et al., 2025). Despite these advances, little is known about how drinking culture influences firms' capital structure decisions. This gap is important because leverage directly determines firms' exposure to financial risk and their resilience to policy shocks.

Moreover, capital structure adjustments may reflect both external financing conditions and internal precautionary motives.

This paper examines how local drinking culture influences corporate leverage decisions in China, with particular attention to ownership heterogeneity. Our empirical setting focuses on the post–Eight-Point Regulation period, during which alcohol-related social activities became subject to heightened scrutiny and governance sensitivity. In such an environment, the economic meaning of drinking culture may shift. For state-owned enterprises (SOEs), which operate under closer political oversight and softer budget constraints (Kornai, 1986; Faccio, 2006; Cull et al., 2015), alcohol-intensive environments may heighten reputational and compliance concerns. We therefore examine whether exposure to stronger local drinking culture is associated with differential leverage behaviour among SOEs relative to non-state firms.

We consider two broad mechanisms. On the supply side, lenders may perceive higher compliance or reputational risk in alcohol-intensive environments and reprice credit accordingly, leading to higher borrowing costs or shorter debt maturity (Rajan and Zingales, 1995; Stulz, 2000). On the demand side, firms may proactively adjust their balance sheets by reducing debt and accumulating liquidity to preserve financial flexibility under heightened governance sensitivity (Acharya et al., 2007; Almeida et al., 2014). These mechanisms generate distinct empirical predictions for borrowing costs, debt maturity, cash holdings, and real investment. Distinguishing between them allows us to identify whether observed deleveraging reflects external credit constraints or internal precautionary adjustment.

To test these hypotheses, we construct a firm-level measure of drinking culture based on the density of alcohol-related points of interest surrounding corporate headquarters. This micro-level measure captures local exposure to alcohol-centred social environments while allowing us to incorporate firm fixed effects, province-by-year fixed effects, and industry-by-year fixed effects. Identification therefore relies on cross-firm differences in local alcohol exposure within the same province-year and industry-year context, net of time-invariant firm heterogeneity and common macroeconomic shocks.

Our baseline empirical specification exploits within-firm variation in exposure to local drinking culture while controlling for high-dimensional fixed effects. Specifically, we regress firm leverage on lagged drinking culture and its interaction with SOE status, including firm fixed effects, province-by-year fixed effects, and industry-by-year fixed effects. All firm-level controls are

lagged by one period to mitigate simultaneity concerns. This design absorbs time-invariant firm characteristics, region-specific macroeconomic shocks, and industry-level leverage dynamics, such that identification relies on within-province-year, within-industry-year cross-firm differences in exposure to local drinking culture. The baseline results show that stronger local drinking culture is associated with significantly lower leverage among SOEs relative to non-state firms. The estimated effects are economically meaningful and stable across progressively demanding specifications. These findings suggest that, conditional on firm fundamentals and rich fixed effects, SOEs systematically adjust their capital structure more conservatively when operating in alcohol-intensive social environments.

While the baseline specification addresses many sources of confounding, concerns may still remain regarding omitted regional characteristics or reverse causality. To further establish a causal interpretation, we implement a two-stage least squares strategy that instruments firm-level drinking culture using agro-climatic suitability for sorghum cultivation interacted with global relative commodity price shocks. This Bartik-type instrument combines predetermined geographic endowments with plausibly exogenous time-series variation in international agricultural markets. Because sorghum suitability is determined by long-run soil and climate conditions, and global commodity prices are set in international markets, the instrument is unlikely to be directly influenced by contemporary firm-level financing decisions. The IV estimates confirm that exogenous increases in local drinking culture causally reduce leverage among SOEs relative to non-state firms. The magnitude of the IV coefficients exceeds that of the OLS estimates, consistent with attenuation bias in the baseline specification. Weak-instrument diagnostics and identification tests further support the validity of the causal design.

We conduct a comprehensive set of tests to rule out alternative explanations. The results remain robust after excluding the COVID-19 period, the nationwide deleveraging campaign, financial firms, and highly diversified corporate groups. The findings are also insensitive to alternative measures of drinking culture, including different geographic radii and a Baidu search index proxy. Across all specifications, the interaction between drinking culture and SOE status remains negative and statistically significant, indicating that the main results are not driven by macroeconomic shocks, regulatory campaigns, measurement choices, or industry composition.

We next investigate the underlying mechanisms. The evidence strongly supports a demand-side precautionary adjustment channel. SOEs exposed to stronger drinking culture reduce net debt

issuance and increase cash holdings, while maintaining stable levels of capital and R&D investment. The decline in leverage is concentrated in more discretionary liability components rather than in bank loans or bond financing. Moreover, we find no systematic increase in borrowing costs or evidence of maturity shortening, providing limited support for a lender-driven supply-side explanation. Together, these patterns indicate that deleveraging reflects proactive balance-sheet conservatism rather than externally imposed credit constraints. Finally, the effect is significantly stronger in regions with weaker formal institutions. This heterogeneity is consistent with an institutional substitution mechanism, whereby informal norms exert greater influence when formal governance structures are less developed.[1]

This study contributes to several strands of literature on culture and corporate finance, state ownership, and informal institutions. First, the paper advances the growing literature on culture and corporate behavior (e.g., Li et al., 2013; Chen et al., 2015; DeBacker et al., 2015; Ahern et al., 2015; Hutton et al., 2015; Guiso et al., 2015; Liu, 2016; Gao et al., 2020; Pan et al., 2020; Li et al., 2021; Graham et al., 2022; Li et al., 2026)[2] by showing that informal social norms shape firms' capital structure decisions. While prior research documents that cultural values influence managerial preferences, risk-taking, disclosure practices, and financing access, little is known about whether and how localized social environments affect corporate leverage choices—particularly in politically sensitive ownership settings. By examining the interaction between local drinking culture and state ownership, we demonstrate that informal norms can causally influence firms' risk-taking through balance-sheet policies.

In particular, we extend the emerging literature linking drinking culture to corporate outcomes (Wang et al., 2023; Li et al., 2025; Tan et al., 2025; Zhang et al., 2025) in several important respects. Unlike prior studies that rely primarily on city- or province-level proxies for alcohol-related activity, we construct a granular firm-level measure of drinking culture based on the density of alcohol-related points of interest within a five-kilometre radius of each firm's headquarters. This localised measure enables a more precise characterisation of the social environment surrounding corporate decision-makers and facilitates the inclusion of firm fixed effects, province-by-year fixed effects, and industry-by-year fixed effects, thereby strengthening

[1] These channel and heterogeneity results are likewise robust to the instrumental variable strategy described above. Please see the Appendix for details.

[2] Interested readers may refer to Gorton et al. (2022) for a review of the related literature.

identification. Substantively, whereas existing research has largely examined how drinking culture influences managerial networks, access to trade credit, or governance practices, we focus on firms' capital structure decisions and show that stronger local drinking culture reduces leverage among state-owned enterprises. We further demonstrate that this effect operates through a demand-side precautionary channel: SOEs exposed to alcohol-intensive environments reduce net debt issuance and increase cash holdings, without evidence of higher borrowing costs or maturity shortening. In contrast to concerns that relationship-based social environments may foster excessive risk-taking or soft-budget behaviour, our findings suggest that drinking culture is associated with more conservative financial policies among politically accountable firms, underscoring the ownership-contingent and institutional nature of informal cultural effects.

Second, this study contributes to the literature on state ownership and corporate finance. Existing work emphasises SOEs' preferential access to credit, implicit government guarantees, and soft budget constraints (Kornai, 1986; Allen et al., 2005; Li et al., 2020). In contrast, we show that SOEs' leverage decisions are not determined solely by financing advantages or policy mandates. Instead, SOEs actively adjust their capital structure in response to informal social environments that carry political and reputational implications. Our findings reveal that stronger drinking culture causally reduces leverage among SOEs, primarily through precautionary balance-sheet adjustment rather than through supply-side credit tightening. This evidence highlights a previously underexplored channel through which political accountability and social norms jointly shape financial policy.

Third, this research contributes to the literature on the determinants of capital structure by extending earlier studies that examine the factors shaping firms' financing decisions (e.g., Modigliani and Miller, 1958; Myers, 1984; Rajan and Zingales, 1995; Frank and Goyal, 2009; Heider and Ljungqvist, 2015 Halling et al., 2016; Geelen et al., 2024). While this literature has traditionally focused on firm fundamentals, taxation, market timing, and financial development, considerably less attention has been paid to the role of informal institutions in influencing leverage choices. Our findings demonstrate that local cultural environments can systematically shape firms' capital structure decisions, particularly in politically sensitive ownership settings. Specifically, we show that drinking culture causally reduces leverage among state-owned enterprises through precautionary balance-sheet adjustment rather than through changes in formal financing conditions.

In doing so, we highlight an institutional channel—rooted in social norms and reputational considerations—through which firms adjust their financial risk exposure.

More broadly, this paper contributes to the literature on informal institutions and economic development (e.g., Cole et al., 1992; Sabatini, 2008; Gorodnichenko and Roland, 2017; Beugelsdijk et al., 2019) by providing micro-level evidence on how culturally embedded practices influence corporate risk-taking and financial policy. By showing that the impact of drinking culture is stronger in regions with weaker formal institutions, we document an institutional substitution mechanism whereby informal norms exert greater influence when rule-based governance is less developed. These findings underscore the importance of incorporating informal social environments into analyses of capital structure and corporate behaviour, particularly in emerging markets where political oversight and relational governance remain salient features of the economic system.

2 Related Literature and Hypothesis Development

A growing literature in corporate finance emphasises that firms' financial policies are shaped not only by formal institutions, but also by informal social norms and local cultural environments. In settings characterised by information asymmetry and relationship-based interactions, cultural practices influence managerial behaviour, risk-taking, and access to external finance by shaping expectations and constraints faced by firms (Petersen and Rajan, 1994; Guiso et al., 2006). These effects are particularly salient in emerging economies, where informal interactions have historically played an important role in business transactions.

Alcohol consumption occupies a distinctive position among informal social practices in China. Beyond individual preferences, alcohol-related socialisation has long been embedded in business interactions and official conduct, facilitating relationship building and informal coordination. Recent studies suggest that alcohol-related activities are correlated with corporate governance outcomes and risk-taking behaviour, indicating that alcohol culture captures systematic variation in the intensity and visibility of informal interactions rather than lifestyle choices alone. Importantly, the economic meaning of alcohol-related behaviour is not fixed, but depends critically on the surrounding institutional and regulatory environment.

The introduction of the Eight-Point Regulation in late 2012 marked a fundamental shift in this environment. By explicitly restricting official banquets, entertainment, and alcohol

consumption by public officials, the regulation transformed alcohol-related social activities from a tolerated or even functional practice into a potential source of governance and compliance risk. Prior research documents that the regulation significantly altered officials' behaviour and strengthened monitoring and enforcement mechanisms (Fan et al., 2015; Li and Zhou, 2015). In the post-regulation period, alcohol-intensive local environments are therefore more likely to be interpreted as signals of heightened scrutiny rather than as benign channels for relationship building.

These institutional changes are especially relevant for state-owned enterprises. SOEs operate at the intersection of market activity and political accountability, and their financial decisions are shaped by both economic incentives and public oversight. While existing studies emphasise the preferential access to finance and implicit guarantees enjoyed by SOEs (Kornai, 1986; Allen et al., 2005), a growing body of work highlights that SOEs are also more exposed to policy shocks and governance reforms. Following the Eight-Point Regulation, alcohol-related social practices may carry greater reputational and compliance risk for SOEs than for non-state firms, given their closer ties to government agencies and heightened political visibility.

The literature suggests that firms' leverage responses to such governance and regulatory changes may arise from both supply-side and demand-side forces. On the supply side, heightened governance and compliance risk can lead creditors and capital markets to reprice risk, resulting in higher borrowing costs and tighter financing conditions (Graham et al., 2015; Chen et al., 2018). In this view, deleveraging reflects a contraction in the supply of external finance, as lenders become more cautious in extending credit to firms perceived as exposed to regulatory or reputational risk. This mechanism implies that leverage reductions are driven, at least in part, by less favourable financing terms.

At the same time, an expanding literature highlights firms' active responses to heightened uncertainty and regulatory pressure. Rather than passively adjusting to external financing constraints, firms may engage in precautionary balance-sheet adjustment by reducing leverage and accumulating liquid assets in order to preserve financial flexibility (Acharya et al., 2007; Almeida et al., 2014). Such demand-side behaviour reflects firms' strategic anticipation of future financing conditions and policy risk, even when external finance remains available at a higher cost. From this perspective, deleveraging is a proactive choice aimed at limiting balance-sheet exposure rather than a mechanical outcome of binding credit constraints.

Importantly, these two forces are not mutually exclusive. In the post–Eight-Point Regulation environment, alcohol-intensive local culture may simultaneously trigger a repricing of financing conditions and induce firms to anticipate a less favourable financing environment. SOEs' closer ties to the state and higher political accountability imply that they are especially sensitive to both external discipline from capital markets and internal precautionary motives. As a result, observed leverage reductions among SOEs in alcohol-intensive environments may reflect the joint operation of supply-side financing pressures and demand-side precautionary adjustment.

Based on the above discussion, we develop the following hypotheses.

Hypothesis 1.

In the post–Eight-Point Regulation period, stronger local alcohol culture is associated with lower leverage among state-owned enterprises relative to non-state firms.

Hypothesis 2.

If leverage reductions among state-owned enterprises are driven by demand-side precautionary adjustment, they should be accompanied by higher cash holdings rather than a contraction in real investment.

Hypothesis 3.

If supply-side financing pressures are present, alcohol-intensive environments should be associated with higher borrowing costs and less favourable financing conditions for state-owned enterprises, reinforcing their incentives to reduce leverage.

3 Data and Empirical Approach

3.1 Empirical Approach

This study examines how local alcohol culture affects firms' leverage decisions, with particular attention to whether the effect differs between state-owned enterprises (SOEs) and non-state firms in the post–Eight-Point Regulation environment. The empirical strategy exploits cross-firm variation in exposure to alcohol-related social environments within the same location–time context while controlling for a rich set of firm fundamentals and unobserved heterogeneity using high-dimensional fixed effects.

Our baseline specification is implemented using the following regression:

$$\mathrm{Lev}_{\mathrm{i,c,t}} = \alpha + \beta_1 \mathrm{Drinking}_{\mathrm{i,c},t-1} + \beta_2 \mathrm{SOE}_{\mathrm{i,c},t-1} + \beta_3 (\mathrm{Drinking}_{\mathrm{i,c},t-1} \times \mathrm{SOE}_{\mathrm{i,c},t-1}) + \rho_1' X_{i,c,t-1} + \varphi_{\mathrm{i}} + \nu_{p\times t} + \lambda_{s\times t} + \varepsilon_{\mathrm{i,c,t}}, \quad (1)$$

where $\mathrm{Lev}_{\mathrm{i,c,t}}$ denotes the corporate leverage of firm i located in city c, measured as total liabilities by total assets. The key explanatory variable, $\mathrm{Drinking}_{\mathrm{i,c},t-1}$, captures firm-level exposure to local drinking culture and is constructed based on the density of alcohol-related points of interest within a 5-kilometer radius of the firm's headquarters. To examine heterogeneity by ownership structure, we interact the alcohol culture measure with an SOE indicator. The coefficient β_3 captures the differential effect for SOEs relative to non-SOEs. In line with our hypothesis development, we anticipate a negative and statistically significant estimate of β_3, which would suggest that, in the post-regulation environment, alcohol-intensive social contexts are associated with comparatively lower leverage among SOEs than among non-state firms.

The vector $X_{i,t-1}$ includes a comprehensive set of lagged firm-level control variables capturing financial performance and corporate governance characteristics: return on assets, firm size, firm age, asset tangibility, sales growth, the proportion of female managers, the proportion of independent directors, ownership–control separation, CEO duality, and an indicator for firm relocation. The relocation indicator is particularly important, as firms that change headquarters may experience exogenous shifts in local social environments, potentially altering their exposure to alcohol culture. All control variables are lagged by one period to mitigate simultaneity concerns and to maintain consistency with the timing of the main explanatory variable.

The empirical design incorporates multiple layers of fixed effects to reduce omitted-variable bias. First, firm fixed effects (ϕ_i) absorb all time-invariant firm characteristics, such as persistent managerial preferences, corporate culture, and long-standing financing policies. Secondly, province-by-year fixed effects ($\nu_{p\times t}$) flexibly control for shocks common to firms operating within the same province in a given year, including regional economic conditions, local policy intensity, and temporal variation in regulatory enforcement. Thirdly, industry-by-year fixed effects ($\lambda_{s\times t}$) account for sector-specific credit conditions, demand shocks, and industry-wide leverage dynamics that evolve over time. Standard errors are clustered at the firm level to accommodate serial correlation and heteroskedasticity within firms over time.

Identification relies on the assumption that, conditional on firm fixed effects, province-by-year fixed effects, industry-by-year fixed effects, and the full set of lagged controls, cross-firm differences in exposure to local alcohol culture are exogenous to time-varying unobserved determinants of leverage. With province-by-year fixed effects included, identification is derived from variation in alcohol culture exposure across firms within the same province and year, net of

shared macroeconomic and policy shocks. The inclusion of industry-by-year fixed effects further ensures that the estimates are not driven by sectoral credit cycles or industry-level leverage trends, thereby isolating within-province, within-industry, cross-firm variation in local social environments as the primary source of identification.

3.2 Data and Summary Statistics

The principal explanatory variable, $Drinking_{i,c,t-1}$, captures the intensity of the alcohol-related social environment surrounding listed firms. In the extant literature, drinking culture is typically proxied at an aggregate regional level, for instance by per capita alcohol consumption (Li et al., 2025) or by the density of Moutai speciality stores within a locality (Zhang et al., 2025). While informative, such measures are inherently coarse and may conflate firm-level exposure with broader regional characteristics. Our approach departs from these conventions by constructing a firm-level measure of drinking culture. This finer geographical granularity enables us to incorporate province-by-year fixed effects, thereby absorbing a wide range of time-varying regional confounders and strengthening identification.

More specifically, we measure drinking culture using data from the Pipixia database, which compiles geocoded information on points of interest (POIs). We identify liquor stores, bars, nightclubs, KTV venues, and discos as establishments that plausibly reflect the local drinking and entertainment environment. POI data prior to 2019 are obtained from Baidu Maps, while observations from 2019 onwards are sourced from Amap (Gaode Maps), ensuring consistent and comprehensive coverage over time. For each firm-year observation, we calculate the number of alcohol-related POIs located within a five-kilometre radius of the firm's registered headquarters. The drinking culture variable is defined as the natural logarithm of one plus this POI count, which mitigates right-skewness and enhances comparability across firms by reducing the influence of extreme values. Although POI coverage after 2020 may exhibit partial missingness due to the disruptions associated with the COVID-19 pandemic, the measure retains substantial cross-sectional dispersion and intertemporal variation throughout the 2012–2023 sample period. Importantly, any residual measurement noise arising from temporary closures or reporting delays is unlikely to be systematically correlated with firm-level leverage decisions, particularly after conditioning on rich fixed effects and lagged controls.

Figure 1 illustrates the spatial distribution of drinking culture across Chinese cities. Panel A presents the distribution in 2012, while Panel B depicts the corresponding pattern in 2022. Two salient features emerge. First, there is pronounced cross-sectional heterogeneity in drinking culture intensity. Significant variation exists not only across major geographical regions but also among cities within the same region, underscoring the uneven spatial distribution of alcohol-related social environments. Secondly, the spatial configuration of drinking culture evolves over time. A comparison of Panels A and B reveals noticeable shifts in both the relative intensity and geographic concentration of alcohol-related establishments between 2012 and 2022. These patterns suggest that local drinking culture is neither uniform nor static; rather, it exhibits meaningful spatial and temporal dynamics over the sample period. This variation provides the empirical foundation for identifying the relationship between alcohol culture and corporate leverage within a high-dimensional fixed-effects framework.

We obtain annual firm-level financial and accounting data from the China Stock Market and Accounting Research (CSMAR) database. The dependent variable, Leverage, is defined as total liabilities divided by total assets at the end of each fiscal year. Consistent with the corporate finance literature, we include a comprehensive set of firm-level control variables capturing profitability, size, age, asset structure, growth opportunities, governance characteristics, and organisational changes. Specifically, these controls comprise return on assets (ROA), firm size (measured as the natural logarithm of total assets), firm age since listing, asset tangibility, sales growth, the proportion of female managers, the proportion of independent directors, the degree of ownership–control separation, CEO duality, and an indicator for headquarters relocation. Detailed variable definitions and data sources are reported in Appendix A.

The sample is restricted to firm-year observations with non-missing values for all variables used in the baseline regressions to ensure internal consistency across specifications. The study period spans 2012–2023. After applying data filters and winsorising all continuous variables at the 1st and 99th percentiles to mitigate the influence of extreme observations, the final sample comprises 18,110 firm-year observations. Table 1 reports the summary statistics for the main variables used in the empirical analysis.

The average leverage ratio is 0.441 (s.d. = 0.209), indicating that liabilities account for approximately 44% of total assets for the typical listed firm. The distribution ranges from 0.065 to 0.976, suggesting substantial but economically plausible variation in capital structure choices

across firms. The absence of extreme outliers reflects the effect of winsorisation and sample screening. The key explanatory variable, Drinking culture, has a mean of 3.369 and a standard deviation of 1.939, with values spanning from 0 to 7.166. The wide dispersion indicates pronounced cross-sectional heterogeneity in firms' exposure to alcohol-related social environments. Importantly, the presence of observations with zero exposure suggests that some firms operate in areas with minimal alcohol-related commercial activity, further strengthening identification through cross-firm variation. Approximately 32.6% of firm-year observations correspond to state-owned enterprises (SOEs), confirming the mixed-ownership structure of China's listed sector and providing sufficient variation to examine ownership-based heterogeneity.

With respect to firm characteristics, the mean return on assets (ROA) is 3.10% (s.d. = 7.65%), with values ranging from –34.11% to 27.49%, indicating the coexistence of financially distressed and highly profitable firms. Firm size, measured as the logarithm of total assets, averages 22.289 (s.d. = 1.327), reflecting considerable variation in organisational scale. The average firm age since listing is 10.86 years (s.d. = 7.92), suggesting a balanced representation of relatively young and more mature listed firms. Asset tangibility averages 0.337, implying that, on average, approximately one-third of total assets are tangible. Sales growth exhibits notable volatility, with a mean of 10.18% and a standard deviation of 32.11%, and values ranging from –116.65% to 144.60%, highlighting substantial heterogeneity in expansion dynamics and operating performance.

Governance-related variables also display meaningful dispersion. The proportion of female managers remains relatively low (mean = 0.0013), although cross-firm variation is observable. The independent director ratio averages 0.0037, again with dispersion across firms. The ownership–control separation variable has a mean of 4.690 and a large standard deviation of 7.211, suggesting considerable heterogeneity in pyramidal ownership structures and potential agency frictions. CEO duality is observed in approximately 30.0% of firm-year observations. Finally, 5.9% of firm-year observations involve headquarters relocation, indicating that while relocation is not pervasive, it is sufficiently frequent to warrant explicit control in the regression framework.

4 Empirical Results

4.1 Baseline Results

Table 2 presents the baseline estimates of the relationship between local drinking culture and corporate leverage, with particular emphasis on heterogeneous effects across ownership types. The empirical design incorporates firm fixed effects, province-by-year fixed effects, and industry-by-year fixed effects, thereby absorbing time-invariant firm characteristics as well as time-varying regional and sectoral shocks. Under this demanding specification, identification relies on cross-firm differences in exposure to local alcohol-related social environments within the same province and year, net of common macroeconomic and policy influences. Across all specifications, the interaction term Drinking culture × SOE is negative and statistically significant, indicating that the effect of local drinking culture on leverage is systematically weaker for state-owned enterprises relative to non-state firms.

In Column (1), which includes firm and year fixed effects but excludes additional firm-level controls, the interaction coefficient is –0.0042 ($p < 0.01$). The main effect of **Drinking culture** is positive and marginally significant, suggesting that, among non-SOEs, greater exposure to alcohol-intensive social environments is associated with higher leverage. The coefficient on **SOE** is positive and highly significant, consistent with the well-documented tendency of SOEs to maintain higher leverage ratios.

Column (2) introduces a comprehensive set of firm-level controls capturing profitability, size, age, tangibility, growth, and governance characteristics. The interaction term remains negative and strongly significant (–0.0023, $p < 0.01$), indicating that the differential effect is not driven by observable differences in firm fundamentals.

Column (3) further incorporates industry-by-year fixed effects, which absorb sector-specific credit conditions and time-varying industry trends. The interaction coefficient remains stable at –0.0026 ($p < 0.01$), suggesting that the heterogeneous response is not attributable to industry-wide leverage dynamics.

Column (4) presents the most stringent baseline specification by additionally including province-by-year fixed effects. This specification flexibly controls for all shocks common to firms operating within the same province in a given year, including regional business cycles, policy enforcement intensity, financial development, and other macro-level influences. Under this high-dimensional structure, identification stems from within-province-year cross-firm variation in local

drinking exposure. Even under these stringent controls, the interaction coefficient remains negative and highly significant (–0.0026, $p < 0.01$).

Although we already control for relocation dummy in our setting, To further mitigate concerns regarding endogenous headquarters location choices, Column (5) restricts the sample to firms that never relocate during the sample period. Why??/ The number of observations decreases to 16,957, yet the interaction term remains negative and statistically significant (–0.0020, $p < 0.05$). This finding suggests that the documented heterogeneity is unlikely to be driven by strategic relocation decisions correlated with leverage.

Taken together, the results provide robust evidence that local drinking culture exerts differential effects on corporate leverage across ownership types. Conditional on firm fixed effects and rich province-by-year and industry-by-year controls, the negative interaction term suggests that SOEs adjust their leverage more conservatively in alcohol-intensive social environments relative to non-state firms. While residual micro-spatial heterogeneity cannot be entirely ruled out, the consistency of the estimates across increasingly stringent specifications supports an interpretation consistent with a causal ownership-contingent behavioural response to local social norms.

4.2 Channel Analysis

The baseline results document a differential leverage response of SOEs to alcohol-intensive local environments in the post–Eight-Point Regulation period. This section investigates the underlying mechanisms. Consistent with Hypotheses 2 and 3, we distinguish between (i) demand-side precautionary balance-sheet adjustment and (ii) supply-side financing pressures. While both channels may operate simultaneously, they generate distinct empirical implications for cash holdings, investment behaviour, borrowing costs, and financing conditions.

4.2.1 Demand-side evidence

We first examine demand-side channel. If SOEs reduce leverage as a proactive response to heightened governance scrutiny and policy uncertainty, the adjustment should originate from the demand side rather than from a contraction in credit supply. Under this mechanism, firms internalise the increased political and reputational risks associated with alcohol-intensive

environments following the Eight-Point Regulation and voluntarily adopt more conservative financial policies.

Specifically, precautionary motives would predict a rebalancing of the balance sheet characterised by (i) lower net debt issuance and (ii) higher cash holdings, as firms seek to preserve financial flexibility in the face of uncertainty (Acharya et al., 2007; Almeida et al., 2014). Importantly, if deleveraging is precautionary rather than constraint-driven, it should not be accompanied by a contraction in real activities such as capital investment or R&D expenditure. Instead, firms would substitute away from external financing while maintaining operating investment, consistent with intertemporal smoothing and liquidity buffer accumulation.

To examine this mechanism, we estimate specifications analogous to the baseline model but replace leverage with: (i) cash holdings scaled by total assets; (ii) net debt change, defined as the change in total debt scaled by lagged total assets; (iii) capital investment scaled by total assets; and (iv) R&D expenditure scaled by total assets. Table 3 reports the results.

Cash Holdings

Columns (1) and (2) show that the interaction term *Drinking culture* × *SOE* is positive and statistically significant. In Column (1), the coefficient is 0.0009 ($p < 0.10$), increasing to 0.0013 ($p < 0.05$) when restricting the sample to non-relocating firms in Column (2). These results indicate that, in alcohol-intensive environments, SOEs accumulate significantly more cash relative to non-state firms following the Eight-Point Regulation.

Although the economic magnitude is modest, it is meaningful. A one-standard-deviation increase in local drinking culture is associated with a non-trivial increase in cash holdings for SOEs relative to non-SOEs, consistent with the accumulation of liquidity buffers in response to heightened governance and policy uncertainty.

The main effect of *Drinking culture* is negative and weakly significant, suggesting that non-SOEs do not exhibit a similar increase in liquidity. The coefficient on *SOE* becomes statistically insignificant once firm fixed effects are included, indicating that the observed effect is driven by differential responses to the regulatory shock rather than by time-invariant ownership characteristics.

Net debt change

Columns (3) and (4) present results using net debt change as the dependent variable. The interaction term is negative in both specifications and statistically significant in both columns (–0.0024 and –0.0021, $p < 0.05$). This finding indicates that SOEs in alcohol-intensive regions reduce net debt issuance relative to non-state firms in the post-regulation period. Importantly, the reduction in net debt issuance occurs simultaneously with an increase in cash holdings. This combination is difficult to reconcile with a purely supply-driven credit contraction. If deleveraging were driven primarily by binding credit constraints, one would expect lower borrowing to coincide with declining liquidity or forced reductions in real activity. Instead, SOEs appear to actively rebalance their balance sheets by curbing external financing while strengthening internal liquidity positions.

Real-Side Outcomes: Capital and R&D Investment

Columns (5) to (8) examine whether deleveraging is accompanied by real-side contraction. The interaction term *Drinking culture* × *SOE* is statistically insignificant for both capital investment and R&D expenditure across specifications. The absence of a negative effect on investment suggests that SOEs do not reduce real activity in response to the regulatory shock.

Taken together, the evidence in Table 4 is consistent with a precautionary demand-side adjustment. SOEs in alcohol-intensive environments reduce net debt issuance and increase cash holdings, while maintaining stable levels of capital and R&D investment. This pattern supports the interpretation that deleveraging reflects voluntary balance-sheet conservatism aimed at preserving financial flexibility, rather than a tightening of external credit supply.

4.2.2 Supply-side evidence

We next examine whether alcohol-intensive environments are associated with lower leverage through a supply-side channel. To identify this mechanism, we conduct two sets of tests. The first assesses whether borrowing costs increase, reflecting a repricing of regulatory and reputational risk. The second investigates whether debt maturity shortens, as lenders adjust the structure of credit in response to heightened uncertainty.

If lenders perceive greater compliance or political risk following the implementation of the Eight-Point Regulation, they are likely to demand a higher risk premium. An increase in borrowing costs directly raises the marginal cost of external finance, thereby reducing firms' optimal leverage.

Even absent quantity rationing, a higher cost of debt can induce firms to scale back borrowing and rely more heavily on internal funds, leading to lower observed leverage. Thus, a rise in borrowing costs constitutes a direct channel through which supply-side risk repricing translates into deleveraging.

In addition to price adjustments, lenders may also respond along the maturity dimension. From the lender's perspective, short-term debt allows for more frequent monitoring and reassessment of borrower quality (e.g. Rajan and Zingales, 1995; Stulz, 2000), and therefore limits exposure under elevated uncertainty. Consequently, a supply-side response would predict not only higher borrowing costs but also a shift away from long-term debt. The overall reduction in leverage should therefore be driven primarily by a contraction in long-term borrowing, while short-term debt either increases or declines less markedly.

Borrowing Costs.

To test the effect on borrowing costs, we employ three alternative measures of the cost of debt: (i) the ratio of financial expenses to total liabilities (COD1); (ii) the ratio of the sum of interest, commissions, and other financial expenses to total liabilities (COD2); and (iii) interest expenses divided by the average of short- and long-term interest-bearing debt during the year (COD3). To examine the cost of equity, we estimate expected returns using four models commonly adopted in the literature: the Ohlson–Juettner (OJ) model, the PEG and MPEG models (Easton, 2004; Ohlson and Juettner-Nauroth, 2005), and the CAPM.[3] We replace the dependent variable separately for cost of borrowing measures, and all other setting are the same as we do in baseline settings. The Panels A and B of Table 4 summarise the results.

Across the three measures of the cost of debt (Panel A), the interaction term Drinking culture × SOE is statistically insignificant in all specifications. The coefficients are economically small and precisely estimated around zero. Moreover, the coefficient on Drinking culture itself is either insignificant or negative in some specifications. Overall, we find no evidence that alcohol-intensive environments are associated with higher debt financing costs for SOEs following the Eight-Point Regulation. Panel B presents the results for the cost of equity. Again, the interaction

[3] We acknowledge the existence of an alternative method—namely, the Residual Income Model proposed by Gebhardt et al. (2001). However, this approach has been shown to be unsuitable for estimating the cost of equity in the context of Chinese firms, as evidenced by Mao et al. (2012).

term is largely insignificant across alternative expected return models and sample specifications. Although we observe isolated significance in the CAPM specification, the effect is not robust across models. In short, the evidence does not suggest a systematic increase in equity financing costs or decrease in cost of debt financing in alcohol-intensive environments. These findings provide limited support for a supply-side repricing channel operating through higher financing costs.

Short-term versus Long-term Leverage.

We next examine whether the composition of leverage shifts along the maturity dimension. As discussed above, if the supply-side mechanism dominates, the decline in leverage associated with alcohol-intensive environments should be concentrated in long-term borrowing, reflecting lenders' preference for shorter maturities under heightened uncertainty. Panel C of Table 4 reports the results for short-term and long-term leverage. The interaction term Drinking culture × SOE is negative and statistically significant for short-term leverage, but insignificant for long-term leverage. This pattern does not support a maturity-substitution mechanism in which lenders shorten debt maturity in response to increased risk. Instead, the reduction in leverage appears to be driven primarily by a decline in short-term borrowing. Taken together, the evidence from Table 3 provides limited support for a supply-side explanation based on risk repricing or maturity shortening. Neither borrowing costs nor long-term leverage exhibit the predicted increase in risk premia or contraction consistent with a lender-driven maturity adjustment. The observed reduction in leverage in alcohol-intensive environments therefore appears unlikely to be driven predominantly by a tightening of credit supply.

4.3 The Role of Formal Institutions

We next examine whether the association between drinking culture and SOE leverage varies with the quality of local formal institutions. Although our empirical setting coincides with a period of heightened governance scrutiny, our focus here is not on the direct effect of any specific policy intervention. Rather, we investigate how informal institutions interact with formal institutional frameworks in shaping corporate financial behaviour, and whether the economic relevance of drinking culture depends on the surrounding rule-based environment.

Institutional theory posits that formal rules and informal norms jointly structure economic activity (North, 1990; Williamson, 2000). Formal institutions—such as legal enforcement, regulatory quality, financial development, and market-supporting mechanisms—govern transactions through codified rules and contract enforcement. Informal institutions, by contrast, operate through shared norms, social expectations, and relational governance embedded in local culture. Where formal institutions are well developed, firms' financing decisions are disciplined primarily by legal protections, transparent contracting, and external monitoring. In such settings, informal norms play a supplementary role. By contrast, where formal institutions are weaker and enforcement is less effective, economic exchange relies more heavily on relational mechanisms, trust-based interactions, and socially embedded networks.

Drinking culture constitutes one such informal institution. Alcohol-based social interactions may facilitate trust formation, reinforce relational governance, and influence access to political or financial resources. In regions with weaker formal institutional development, these informal mechanisms are likely to carry greater economic weight, as firms depend more on social ties to navigate uncertainty and coordinate transactions. Prior evidence suggests that alcohol-related norms are closely intertwined with guanxi-based relational governance (Fang and Jin, 2019) and that their economic consequences, such as rent-seeking and earnings management, are more pronounced where governance constraints are weaker (Li et al., 2016). Consequently, the influence of drinking culture on corporate financial policies—particularly leverage decisions—should be more pronounced in such environments. Conversely, where formal institutions are stronger and rule-based governance prevails, reliance on informal social norms is reduced, and the marginal impact of drinking culture on leverage should be attenuated. This framework implies an institutional substitution mechanism, whereby informal institutions matter more precisely when formal institutions are less effective.

To test this proposition, we partition the sample according to provincial formal institutional quality from Fan et al. (2007) and Shi et al. (2017) and re-estimate the baseline specification separately for high- and low-quality institutional environments. Table 5 reports the results. In regions with stronger formal institutions (Columns (1) and (2)), the interaction term *Drinking culture* × *SOE* is statistically insignificant. The coefficients are economically small and precisely estimated around zero, indicating that drinking culture does not have a discernible association with SOE leverage in these provinces.

In contrast, in regions with weaker formal institutions (Columns (3) and (4)), the interaction term is negative and statistically significant. The estimated coefficients (–0.0039 and –0.0022) indicate that SOEs located in alcohol-intensive environments exhibit significantly lower leverage relative to non-state firms in these regions. The economic magnitude suggests a materially stronger association in weaker institutional settings, consistent with the view that informal norms exert greater influence where formal constraints are limited.

Overall, the evidence supports an institutional substitution mechanism. Informal institutions such as drinking culture exert greater influence on corporate financial behaviour when formal governance structures are less developed. In regions characterised by weaker formal institutions, social norms and relational practices play a more substantial role in shaping leverage decisions. By contrast, in stronger formal institutional environments, the disciplining effect of formal rules attenuates the impact of informal cultural norms. These findings highlight the conditional nature of informal institutions and underscore the importance of institutional context in understanding corporate financial policy.

4.4 Composition of Leverage

Having documented that SOEs located in alcohol-intensive environments exhibit lower overall leverage, we next investigate which components of debt account for this decline. Examining the composition of leverage allows us to distinguish whether the reduction reflects constraints in formal financing channels, a withdrawal of relationship-based funding, or a broader restructuring of liabilities. To this end, we decompose total leverage into four components—bank borrowing, trade credit, bond financing, and other liabilities—each scaled by total assets, and re-estimate the baseline specification using each component as the dependent variable. Table 6 reports the results.

The estimates indicate that the decline in leverage is not driven by reductions in formal debt channels. The interaction term Drinking culture × SOE is statistically insignificant for bank borrowing, suggesting that SOEs in alcohol-intensive regions do not experience a contraction in bank credit. Similarly, we find no significant effect for trade credit. This implies that financing obtained from suppliers and business partners remains stable, indicating that firms' commercial relationships are not materially disrupted. Bond financing also exhibits no significant change, suggesting that access to public debt markets is unaffected. In contrast, the reduction in leverage

is concentrated in the category of "other liabilities." The interaction term is negative and statistically significant in both specifications, indicating that SOEs located in alcohol-intensive environments reduce this residual component of debt. The magnitude of the coefficients suggests a meaningful decline relative to the baseline.

This pattern is informative. Bank loans and bond issuance are typically governed by formal contracts, regulatory oversight, and market-based pricing mechanisms. Trade credit, while relational in nature, is closely tied to operational transactions and supply-chain relationships.[4] The absence of significant changes in these categories suggests that the observed deleveraging does not stem from a tightening of formal financial constraints or a deterioration in core business relationships. By contrast, "other liabilities" often include financing arrangements that are more discretionary, less transparent, or less strictly regulated. Such liabilities may encompass temporary borrowings, non-standard credit arrangements, or other forms of financing that rely more heavily on managerial discretion and informal coordination. The concentration of the leverage reduction in this category is therefore consistent with the notion that firms adjust the more flexible and relationship-sensitive components of their capital structure.

4.5 Robustness Checks

To ensure that our main findings are not driven by confounding macroeconomic shocks, regulatory campaigns, industry composition, or measurement choices, we conduct a series of robustness tests. Table 7 reports the results.

Addressing Alternative Explanations

We begin by addressing several potential confounding factors that could provide alternative explanations for the documented association between drinking culture and SOE leverage. Columns (1) and (2) of Panel A exclude the COVID-19 period. The pandemic introduced unprecedented liquidity shocks, large-scale policy stimulus, and regulatory forbearance that substantially altered firms' financing environments, particularly for state-owned enterprises that

[4] One noteworthy finding is that drinking culture itself is not associated with access to trade credit. This result differs from Zhang et al. (2025), who argue that drinking culture facilitates firms' access to trade credit. Using a more detailed and firm-level measure of drinking culture, rather than a broader regional proxy, we do not find evidence that drinking culture improves access to credit.

may have benefited from targeted credit support. At the same time, widespread lockdowns and mobility restrictions led to the temporary closure of bars, restaurants, and other alcohol-related venues, potentially weakening the economic relevance of alcohol-related POIs as a proxy for local drinking culture. If the observed deleveraging among SOEs were driven either by pandemic-induced financing distortions or by short-term disruptions to alcohol-related social activity, excluding the COVID-19 period should attenuate the estimated effect. However, the interaction term *Drinking culture* × *SOE* remains negative and statistically significant, indicating that our findings are not driven by crisis-specific credit conditions or temporary closures of alcohol-related establishments.

Columns (3) and (4) of Panel A exclude the nationwide deleveraging campaign period. Beginning in the 2016, China implemented broad macro-prudential policies aimed at reducing systemic financial risk, with particular emphasis on curbing leverage in state-owned enterprises. Given that SOEs were primary targets of these regulatory initiatives, one potential concern is that the decline in leverage simply reflects centrally mandated deleveraging rather than firm-level responses associated with drinking culture. By removing this policy-intensive period, we isolate variation unrelated to macro-level tightening. As shown in Columns (3) and (4) of Panel A, the interaction term remains strongly negative and statistically significant, with even larger magnitudes, indicating that the documented effect is not subsumed by nationwide deleveraging policies but instead reflects a distinct and persistent relationship.

Columns (5) and (6) of Panel A exclude financial firms. Financial institutions operate under fundamentally different capital requirements, regulatory constraints, and leverage norms compared to non-financial firms (Adrian and Shin, 2010). Their balance sheets are more sensitive to monetary policy and prudential regulation, which could confound the interpretation of leverage dynamics. By restricting the sample to non-financial firms, we ensure that our results are not driven by industry-specific capital structure mechanics. The persistence of the negative interaction term indicates that the main findings are not attributable to the unique leverage structures of financial institutions.

Finally, Columns (7) and (8) of Panel A exclude firms with a large number of subsidiaries. Firms with complex organisational structures often rely more heavily on intra-group financing, cross-guarantees, and internal capital markets (Stein, 1997), which may mechanically influence measured leverage and obscure the true source of debt adjustments. In addition, firms with

numerous subsidiaries are typically geographically diversified, implying exposure to multiple regional environments. In such cases, using headquarters-based measures of local drinking culture may introduce measurement error if subsidiaries operate in regions with different cultural intensity. To mitigate these concerns, we restrict the sample to firms whose number of subsidiaries falls below the 30th percentile of the full sample distribution (i.e., fewer than six subsidiaries), thereby focusing on firms with relatively simple organisational and geographic structures.[5] If the observed deleveraging were merely an artefact of internal reallocation within diversified corporate groups or cross-regional exposure, the estimated effect should weaken under this restriction. Instead, the interaction term remains negative and statistically significant, suggesting that the documented relationship is not driven by internal capital market dynamics or geographic measurement bias associated with highly diversified firms.

Across all specifications in Panel A, the coefficient on *Drinking culture* × *SOE* remains negative and statistically significant. The stability in sign, magnitude, and statistical significance across alternative samples reinforces the robustness of our main result and mitigates concerns that it is driven by macroeconomic shocks, regulatory campaigns, industry-specific capital structures, or corporate complexity.

Alternative Measures of Drinking Culture

In the baseline specification, drinking culture is measured at the firm level using the logarithm of the number of alcohol-related points of interest (POIs) within a 5-kilometre radius of the firm's headquarters. To assess whether our results are sensitive to the choice of geographic radius, we re-estimate the model using alternative distance thresholds—10 km, 3 km, and 1 km—around the firm's location. These alternative measures capture broader and narrower definitions of local alcohol intensity. The results remain consistent: the interaction term Drinking culture × SOE is negative and statistically significant across all distance specifications.

In addition, we employ an alternative proxy based on the Baidu search index related to alcohol consumption, which captures regional public attention and cultural salience of drinking behaviour. Using this alternative measure, the interaction term continues to be negative and

[5] We acknowledge that this approach is not perfect, as firms may still operate multiple subsidiaries. However, further restricting the sample to firms with zero or fewer than five subsidiaries is not feasible, as such restrictions would substantially reduce the sample size and prevent reliable estimation.

statistically significant (see Columns (7) and (8) at Panel B). Taken together, the evidence from demonstrates that our main findings are robust to alternative measurement approaches of alcohol culture.

Instrumental variable method

To further address concerns regarding reverse causality and omitted variable bias, we adopt an instrumental variable strategy that exploits exogenous variation in agro-climatic suitability for sorghum cultivation, interacted with global commodity price shocks. This approach leverages both long-run geographic endowments and plausibly exogenous time-series variation in international agricultural markets.

Our identification strategy is grounded in the historical role of sorghum as a key raw material in the production of traditional Chinese distilled spirits. Regions that are naturally more suitable for sorghum cultivation were historically more likely to develop sorghum-based agricultural systems and related liquor production activities. Over time, such production structures contributed to the persistence of alcohol-related social norms and drinking culture. Importantly, agro-climatic suitability is determined by long-run soil characteristics, terrain conditions, and climatic patterns, and thus predates contemporary firm-level financial decisions.

We measure sorghum suitability using data from the FAO–IIASA Global Agro-Ecological Zones (GAEZ v4) database. Specifically, we construct a province-level index defined as the share of total land classified as either "Very Suitable" or "Suitable" for sorghum cultivation. The measure is aggregated across agro-ecological zones using total land area weights to capture the overall geographic endowment of each province. Because these suitability measures are based on historical climate conditions and biophysical characteristics, they are plausibly exogenous to firms' capital structure choices.

To introduce time variation, we interact this time-invariant suitability measure with global relative price shocks derived from the World Bank's Global Economic Monitor (GEM) Commodities database (Pink Sheet). The instrument is defined as:

$$Z_{it} = Suitability_i \times \ln\left(\frac{P^{WB}_{sorghum,t}}{P^{WB}_{maize,t}}\right)$$

where $P^{WB}_{sorghum,t}$ and $P^{WB}_{maize,t}$ denote annual international prices of sorghum and maize, respectively. Using relative prices rather than the absolute sorghum price isolates sorghum-specific

profitability shocks and purges common movements in agricultural commodity prices that may reflect global inflation, energy price fluctuations, or broad macroeconomic cycles. In this way, the instrument captures changes in the relative attractiveness of sorghum production in globally integrated markets.

Importantly, our baseline specification includes both Drinking culture and its interaction with the SOE indicator. If drinking culture is endogenous—due to omitted regional characteristics or reverse causality—then the interaction term Drinking culture × SOE is mechanically endogenous as well. To address this issue, we instrument both endogenous regressors simultaneously. In addition to Z_{it}, we include its interaction with the SOE indicator, $Z_{it} \times SOE_i$, as an excluded instrument. This approach ensures that both Drinking culture and Drinking culture × SOE are properly instrumented and that the heterogeneous effect across ownership types is identified using exogenous variation.

As shown in Table 8, The first-stage results confirm the relevance of the instruments. The Sanderson–Windmeijer F-statistics equal 30.77 for Drinking culture × SOE and 14.37 for Drinking culture, both exceeding conventional thresholds for weak instrument concerns. The Kleibergen–Paap rk LM statistic rejects the null of underidentification ($\chi^2 = 14.80$, $p < 0.001$), indicating that the model is identified. The Kleibergen–Paap rk Wald F-statistic equals 7.18, which exceeds the Stock–Yogo critical value corresponding to a 10% maximal IV size, suggesting that weak identification is not a serious concern. In addition, the Anderson–Rubin test rejects the joint null that the endogenous regressors are insignificant ($F = 20.91$, $p < 0.001$), providing inference robust to potential weak instrument problems. Taken together, these statistics indicate that the Bartik-type instrument and its interaction with ownership status generate sufficiently strong exogenous variation.

The exclusion restriction requires that sorghum suitability interacted with global relative price shocks affects SOE leverage only through its influence on drinking culture. This assumption is plausible given several features of our empirical design. Sorghum suitability reflects predetermined geographic and agro-climatic conditions—such as soil quality, terrain, and long-run climate patterns—that are orthogonal to contemporary corporate financing decisions. The World Bank commodity prices are determined in international markets and driven by global supply–demand forces, making it implausible that leverage choices of Chinese firms could influence these prices. By using sorghum prices relative to maize prices, we further purge common

agricultural price movements that may reflect global inflation or broad macroeconomic cycles. Our specification includes firm and year fixed effects, absorbing time-invariant firm characteristics and nationwide shocks, and additionally incorporates industry-by-year fixed effects[6], which flexibly control for time-varying industry-level financing conditions and cost exposures to commodity price fluctuations. Identification therefore relies on within-industry-year variation across firms located in regions with different sorghum suitability, substantially reducing the likelihood that the instrument captures direct credit supply or industry-wide cost shocks unrelated to local alcohol culture.

In the second stage, the coefficient on *Drinking culture* × *SOE* remains negative and statistically significant, consistent with the baseline OLS results. Notably, the magnitude of the IV estimate is approximately twice as large as its OLS counterpart, which aligns with classic causal inference literature (e.g., Angrist and Krueger, 2001; Card, 2001; Angrist and Pischke, 2009). This suggests that OLS may understate the true effect due to attenuation bias or other sources of endogeneity. The economic magnitude remains meaningful, indicating that SOEs located in regions with stronger drinking culture exhibit substantially lower leverage. Taken together, these findings support a causal interpretation of the deleveraging effect and mitigate concerns that the baseline results are driven by reverse causality or omitted macroeconomic factors.[7]

5 Conclusion

This paper examines how informal social norms shape corporate capital structure decisions. Exploiting firm-level exposure to local drinking culture in China, we document that state-owned enterprises (SOEs) located in alcohol-intensive environments exhibit significantly lower leverage relative to non-state firms. The result is robust to extensive alternative specifications and sample restrictions, including the exclusion of the COVID-19 period, nationwide deleveraging campaigns, financial firms, and highly diversified corporate groups. To address potential endogeneity, we

[6] We do not include province-by-year fixed effects in the IV specification because the instrument varies at the province-year level. Absorbing province-year fixed effects would mechanically eliminate the identifying variation generated by province-level suitability interacted with global price shocks.

[7] To further alleviate concerns regarding endogeneity, we re-examine all mechanism and heterogeneity analyses using the same instrumental variable strategy as in the baseline specification. The second-stage estimates are presented in the Appendix and confirm that the main conclusions remain robust.

implement an instrumental variable strategy that leverages exogenous variation in agro-climatic suitability for sorghum cultivation interacted with global relative commodity price shocks. The IV estimates confirm and amplify the baseline results, supporting a causal interpretation. Weak-instrument diagnostics and identification tests further indicate that the estimated effect is not driven by spurious correlation or omitted macroeconomic shocks.

Mechanism analyses indicate that drinking culture induces demand-side precautionary adjustments in SOEs' financial policies. SOEs exposed to stronger drinking culture reduce net debt issuance and increase cash holdings, while maintaining stable levels of capital expenditures and R&D investment. The decline in leverage is concentrated in more discretionary liabilities, suggesting active balance-sheet management rather than externally imposed credit constraints. The effect is significantly stronger in regions with weaker formal institutions, consistent with an institutional substitution mechanism in which informal norms exert greater causal influence when formal governance structures are less developed.

These findings demonstrate that informal cultural environments can shape corporate financial risk-taking through politically mediated channels. In transitional economies, where ownership structure and institutional quality condition firms' exposure to social norms, culturally embedded behaviors translate into systematic differences in capital structure choices. For politically connected firms such as SOEs, changes in the social salience or regulatory implications of drinking-related practices can materially alter risk management decisions.

Overall, our evidence establishes that informal social norms are not merely background cultural traits but causal determinants of corporate financial policy. By integrating culture, ownership, and institutional context, this study advances understanding of how informal institutions interact with political economy to shape firm behavior.

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Table 1. Summary Statistics

This table reports the summary statistics of the sample with non-missing variables. All variables are measured at the annual frequency from 2012 to 2023.

Variable name	N	Mean	Std. Dev.	Min	Max
Leverage	25,024	0.4406	0.2090	0.0649	0.9763
Drinking culture	25,024	3.3689	1.9394	0.0000	7.1655
SOE	25,024	0.3262	0.4688	0.0000	1.0000
ROA	25,024	0.0310	0.0765	-0.3411	0.2749
Size	25,024	22.2886	1.3268	18.8678	26.7881
Age	25,024	10.8629	7.9207	0.0000	27.0000
Tangibility	25,024	0.3369	0.1717	0.0116	0.8076
Sales growth	25,024	0.1018	0.3211	-1.1665	1.4460
Female manager	25,024	0.0013	0.0027	0.0000	0.0222
Independent director ratio	25,024	0.0037	0.0065	0.0000	0.0682
Separation	25,024	4.6895	7.2109	0.0000	28.3314
Duality	25,024	0.3002	0.4584	0.0000	1.0000
Relocate	25,024	0.0593	0.2362	0.0000	1.0000

Table 2. Baseline Results

Notes: This table reports regressions of corporate leverage on local drinking culture and its interaction with state ownership. The dependent variable is Leverage (total liabilities/total assets). Drinking culture is measured as ln (1 + # alcohol-related POIs) within a 5-kilometre radius of the firm's headquarters; SOE equals one for state-owned enterprises. All regressors are lagged by one year. Column (1) includes firm and year fixed effects; Column (2) additionally includes firm-level controls. Column (3) further includes industry-by-year fixed effects. Columns (4)–(5) additionally include county-by-year fixed effects. Column (5) restricts the sample to firms that never relocate during the sample period; consequently, Relocate is not included. Standard errors are clustered at the firm level and reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Dep. Var.: Leverage				
	(1)	(2)	(3)	(4)	(5)
Drinking culture × SOE	-0.0042***	-0.0023***	-0.0026***	-0.0026***	-0.0020**
	(0.0007)	(0.0006)	(0.0007)	(0.0007)	(0.0009)
Drinking culture	0.0020*	0.0016	0.0016	0.0017	0.0026**
	(0.0011)	(0.0010)	(0.0010)	(0.0011)	(0.0013)
SOE	0.0384***	0.0267***	0.0250***	0.0231***	0.0298***
	(0.0097)	(0.0085)	(0.0085)	(0.0085)	(0.0105)
ROA		-0.4603***	-0.4551***	-0.4488***	-0.4493***
		(0.0192)	(0.0192)	(0.0189)	(0.0234)
Size		0.0561***	0.0558***	0.0550***	0.0580***
		(0.0041)	(0.0040)	(0.0040)	(0.0051)
Age		0.0105***	0.0072	0.0090*	0.0093
		(0.0049)	(0.0052)	(0.0054)	(0.0059)
Tangibility		0.1005***	0.1002***	0.0993***	0.0932***
		(0.0152)	(0.0151)	(0.0150)	(0.0181)
Sales growth		0.0140***	0.0131***	0.0137***	0.0168***
		(0.0032)	(0.0032)	(0.0032)	(0.0039)
Female manager		0.4794	0.2748	0.2264	-0.1613
		(1.0824)	(1.0381)	(1.0348)	(1.3387)
Independent director ratio		0.1057	-0.0251	0.0902	-0.0785
		(0.4695)	(0.4419)	(0.4402)	(0.6865)
Separation		-0.0004*	-0.0005*	-0.0004	-0.0002
		(0.0003)	(0.0003)	(0.0003)	(0.0003)
Duality		-0.0006	-0.0010	0.0004	0.0007
		(0.0034)	(0.0033)	(0.0033)	(0.0036)
Relocate		0.0030	0.0028	0.0023	--
		(0.0033)	(0.0033)	(0.0033)	
Industry-year FE	No	No	Yes	Yes	Yes
Province-year FE	No	No	No	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.7781	0.8049	0.8072	0.8095	0.8319
Observations	25,024	25,024	25,024	25,024	16,957

Table 3. Demand-Side Channel: Cash Holdings, Net Debt Issuance, and Investment

This table examines whether the reduction in leverage among SOEs in alcohol-intensive environments reflects precautionary balance-sheet adjustment. The dependent variable is cash holdings scaled by total assets in Columns (1) and (2), net debt change in Columns (3) and (4), capital investment scaled by total assets in Columns (5) and (6), and R&D expenditure scaled by total assets in Columns (7) and (8). Cash holdings are defined as cash and cash equivalents divided by total assets. Net debt change is measured as the annual change in total interest-bearing debt scaled by lagged total assets. Capital investment is defined as capital expenditures divided by total assets. R&D investment is measured as R&D expenditure divided by total assets. Drinking culture is a measure of regional alcohol intensity. SOE is an indicator variable equal to one if the firm is state-owned, and zero otherwise. The coefficient of interest is the interaction term Drinking culture × SOE. Columns labelled "Explicitly control for relocation dummy" include an indicator for firm relocation, while columns labelled "Exclude relocation firms" restrict the sample to firms that do not relocate during the sample period. All regressions include firm fixed effects, industry-year fixed effects, and province-year fixed effects. Control variables are identical to those used in the baseline specification. Standard errors are clustered at the firm level and reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Cash holdings		Net debt change		Capital Investment		R&D investment	
	Explicitly control for relocation dummy	Exclude relocation firms	Explicitly control for relocation dummy	Exclude relocation firms	Explicitly control for relocation dummy	Exclude relocation firms	Explicitly control for relocation dummy	Exclude relocation firms
Drinking culture × SOE	0.0009*	0.0013**	-0.0024**	-0.0021**	-9.35e-06	0.0002	-0.00004	-0.00004
	(0.0005)	(0.0006)	(0.0009)	(0.0010)	(0.0002)	(0.0003)	(0.00004)	(0.00004)
Drinking culture	-0.0016*	-0.0019*	-0.0011	-0.0020	0.0006*	0.0001	-0.0001*	-0.0002**
	(0.0009)	(0.0010)	(0.0013)	(0.0015)	(0.0003)	(0.0004)	(0.00006)	(0.0001)
SOE	-0.0115*	-0.0127	-0.0022	-0.0010	-0.0061***	-0.0076	0.0008***	0.0009**
	(0.0062)	(0.0081)	(0.0096)	(0.0113)	(0.0021)	(0.0028)	(0.0003)	(0.0004)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.7189	0.7387	0.2035	0.2249	0.5341	0.5629	0.7251	0.7301
Observations	22,717	15,588	18,096	12,174	25,024	16,957	25,024	16,957

Table 4. Supply-Side Channel: Borrowing Costs and Debt Maturity

This table reports the results of tests examining the supply-side channel. Panels A and B present regressions where the dependent variables measure the cost of debt and the cost of equity, respectively. Panel C reports regressions in which leverage is decomposed into short-term and long-term components. In Panel A, the cost of debt is measured alternatively as: (i) financial expenses divided by total liabilities (COD1); (ii) the sum of interest, commissions, and other financial expenses divided by total liabilities (COD2); and (iii) interest expenses divided by the average of short- and long-term interest-bearing debt during the fiscal year (COD3). In Panel B, the cost of equity is estimated using four implied cost of capital models: the Ohlson–Juettner (OJ) model, the PEG model, the modified PEG (MPEG) model (Easton, 2004; Ohlson and Juettner-Nauroth, 2005), and the CAPM. In Panel C, short-term leverage is defined as short-term liabilities divided by total assets, and long-term leverage is defined as long-term liabilities divided by total assets. Drinking culture is a measure of regional alcohol intensity. SOE is an indicator variable equal to one if the firm is state-owned, and zero otherwise. The coefficient of interest is the interaction term Drinking culture × SOE. Columns labelled "Explicitly control for relocation dummy" include an indicator for firm relocation; columns labelled "Exclude relocation firms" exclude firms that relocate during the sample period. All regressions include firm fixed effects, industry-year fixed effects, and province-year fixed effects. Control variables are identical to those used in the baseline specification. Standard errors are clustered at the firm level and reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Cost of Debt						
	COD1		COD2		COD3	
	(1)	(2)	(3)	(4)	(5)	(6)
	Explicitly control for relocation dummy	Exclude relocation firms	Explicitly control for relocation dummy	Exclude relocation firms	Explicitly control for relocation dummy	Exclude relocation firms
Drinking culture × SOE	-0.0002	-0.0001	-1.91e-06	-0.00002	0.0005	-0.0005
	(0.0002)	(0.0002)	(0.00008)	(0.0001)	(0.0007)	(0.0008)
Drinking culture	-0.00004	-0.00003	0.00006	0.0001	-0.0019**	-0.0021*
	(0.0002)	(0.0003)	(0.0001)	(0.0001)	(0.0009)	(0.0011)
SOE	-0.0023	-0.0026	-0.0006	-0.0002	-0.0021	0.0046
	(0.0020)	(0.0026)	(0.0008)	(0.0011)	(0.0057)	(0.0053)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes
Province-year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.3656	0.3538	0.4415	0.4355	0.2375	0.2459
Observations	23,899	16,204	23,899	16,204	21,740	14,673

Panel A: Cost of Equity								
	Ohlson and Juettner-Nauroth		PEG		MPEG		CAPM	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Explicitly	Exclude	Explicitly	Exclude	Explicitly	Exclude	Explicitly	Exclude

	control for relocation dummy	relocation firms	control for relocation dummy	relocation firms	control for relocation dummy	relocation firms	control for relocation dummy	relocation firms
Drinking culture × SOE	0.0001	-0.00006	-0.0001	-0.0004	0.0007	0.0005	0.0003*	0.0001
	(0.0005)	(0.0005)	(0.0004)	(0.0005)	(0.0005)	(0.0006)	(0.0001)	(0.0002)
Drinking culture	-0.0002	-0.0005	-0.0002	-0.0004	-0.0003	-0.0007	0.0001	0.0003
	(0.0006)	(0.0007)	(0.0005)	(0.0006)	(0.0007)	(0.0008)	(0.0002)	(0.0003)
SOE	-0.0096**	-0.0070	-0.0061	-0.0036	-0.0189***	-0.0148***	-0.0028**	-0.0021
	(0.0041)	(0.0047)	(0.0042)	(0.0046)	(0.0051)	(0.0052)	(0.0012)	(0.0016)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.4223	0.4280	0.4191	0.4247	0.4955	0.5072	0.6176	
Observations	8,842	6,296	9,201	6,505	8,988	6,391	15,836	

Panel C: short-term versus long-term leverage

	Short-term leverage		Long-term leverage	
	(1)	(2)	(3)	(4)
	Explicitly control for relocation dummy	Exclude relocation firms	Explicitly control for relocation dummy	Exclude relocation firms
Drinking culture × SOE	-0.0011**	-0.0019***	-0.0006	-0.0007
	(0.0005)	(0.0006)	(0.0004)	(0.0005)
Drinking culture	-0.0005	0.0001	-0.0001	-0.00008
	(0.0007)	(0.0008)	(0.0005)	(0.00007)
SOE	0.0042	-0.0040	-0.0011	0.0026
	(0.0051)	(0.0065)	(0.0039)	(0.0045)
Controls	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes
Province-year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Adj. R-squared	0.6739	0.7018	0.5884	0.5985
Observations	20,663	13,736	25,024	16,957

Table 5. Formal Institutions and the Conditional Effect of Drinking Culture

This table examines whether the association between drinking culture and SOE leverage varies with the quality of local formal institutions. The sample is partitioned into provinces with high and low levels of formal institutional development based on the provincial marketisation index. Provinces above (below) the median marketisation index are classified as high (low) formal institutional quality. All regressions include firm fixed effects, industry-year fixed effects, and province-year fixed effects. Control variables are identical to those used in the baseline specification. Standard errors are clustered at the firm level and reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	High quality		Low quality	
	Explicitly control for relocation dummy	Exclude relocation firms	Explicitly control for relocation dummy	Exclude relocation firms
Drinking culture × SOE	-0.0006	-0.0013	-0.0039***	-0.0022*
	(0.0013)	(0.0014)	(0.0011)	(0.0012)
Drinking culture	0.0019	0.0026	0.0007	-0.0007
	(0.0018)	(0.0018)	(0.0015)	(0.0016)
SOE	0.0243*	0.0205	0.0212*	0.0256*
	(0.0142)	(0.0165)	(0.0119)	(0.0150)
Controls	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes
Province-year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Adj. R-squared	0.8204	0.8417	0.8156	0.8316
Observations	10,058	7,108	9,541	6,626

Table 6. Decomposition of Leverage by Debt Type

This table examines which components of leverage account for the observed reduction in total leverage among SOEs in alcohol-intensive environments. The dependent variables are the individual components of debt scaled by total assets: bank borrowing in Columns (1) and (2), trade credit in Columns (3) and (4), bond financing in Columns (5) and (6), and other liabilities in Columns (7) and (8). Bank borrowing includes short-term and long-term bank loans. Trade credit is measured as accounts payable and notes payable scaled by total assets. Bond financing refers to outstanding corporate bonds scaled by total assets. Other liabilities represent the residual category of total liabilities excluding bank loans, trade credit, and bonds. All regressions include firm fixed effects, industry-year fixed effects, and province-year fixed effects. Control variables are identical to those used in the baseline specification. Standard errors are clustered at the firm level and reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Bank Loans		Trade credit		Bond Financing		Other Liabilities	
	Explicitly control for relocation dummy	Exclude relocation firms	Explicitly control for relocation dummy	Exclude relocation firms	Explicitly control for relocation dummy	Exclude relocation firms	Explicitly control for relocation dummy	Exclude relocation firms
Drinking culture × SOE	-0.0001	0.0004	0.0002	0.0002	-0.0001	-0.0002	-0.0027**	-0.0026*
	(0.0007)	(0.0009)	(0.0007)	(0.0008)	(0.0002)	(0.0003)	(0.0013)	(0.0016)
Drinking culture	-0.0001	0.0003	-0.0004	-0.0012	0.00007	0.0004	0.0023	0.0035*
	(0.0010)	(0.0012)	(0.0010)	(0.0011)	(0.0003)	(0.0004)	(0.0018)	(0.0021)
SOE	-0.0156**	-0.0195**	0.0009	0.0026	-0.0027	-0.0036	0.0385***	0.0518***
	(0.0074)	(0.0096)	(0.0068)	(0.0090)	(0.0022)	(0.0030)	(0.0132)	(0.0170)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.4408	0.4443	0.2924	0.2997	0.3606	0.3654	0.6090	0.6189
Observations	25,024	16,957	25,024	16,957	25,024	16,957	25,024	16,957

Table 7. Robustness Checks

Notes: This table reports robustness tests of the baseline results. Panel A addresses alternative explanations by (i) excluding the COVID-19 period, (ii) excluding the deleveraging campaign period, (iii) excluding financial firms, and (iv) excluding firms with many subsidiaries. For each setting, we further (a) explicitly control for a firm relocation dummy and (b) exclude relocation firms from the sample. Panel B uses alternative measures of local alcohol culture, including the number of alcohol-related POIs within 10 km, 3 km, and 1 km of the firm's headquarter address, and the Baidu search index related to alcohol consumption. The dependent variable is defined as in the baseline specification. Drinking culture measures local alcohol culture, and SOE is an indicator equal to one for state-owned enterprises. The interaction term Drinking culture × SOE captures the differential effect of local drinking culture on SOEs relative to non-SOEs. All regressions include the same set of firm-level control variables as in the baseline model. Industry-year, province-year, and firm fixed effects are included in all specifications. Standard errors are reported in parentheses and are clustered at the firm level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

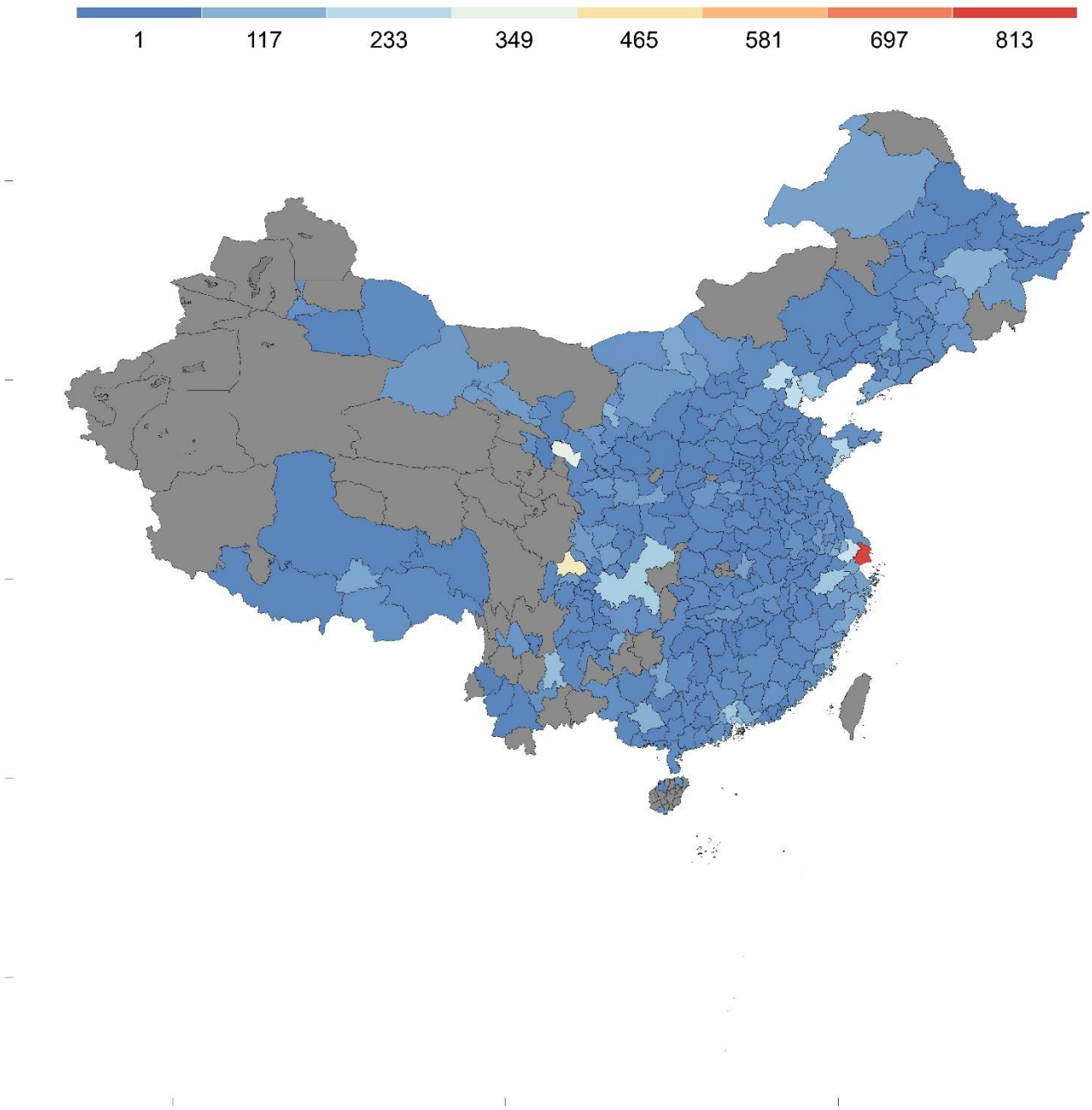
Panel A: Addressing alternative explanations								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Exclude COVID-19 period		Exclude Deleverage period		Exclude financial firms		Exclude firms with many subsidiaries	
	Explicitly control for relocation dummy	Exclude relocation firms	Explicitly control for relocation dummy	Exclude relocation firms	Explicitly control for relocation dummy	Exclude relocation firms	Explicitly control for relocation dummy	Exclude relocation firms
Drinking culture × SOE	-0.0016**	-0.0013*	-0.0141***	-0.0205***	-0.0026***	-0.0020**	-0.0035**	-0.0037*
	(0.0007)	(0.0008)	(0.0050)	(0.0067)	(0.0007)	(0.0009)	(0.0018)	(0.0019)
Drinking culture	0.0008	0.0008	0.0099***	0.0071	0.0016	0.0025**	0.0004	0.0011
	(0.0014)	(0.0015)	(0.0038)	(0.0045)	(0.0011)	(0.0013)	(0.0020)	(0.0021)
SOE	0.0145	0.0209*	0.0125***	0.0290	0.0225***	0.0294***	0.0047	0.0183
	(0.0113)	(0.0113)	(0.0292)	(0.0282)	(0.0084)	(0.0105)	(0.0189)	(0.0200)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.8206	0.8374	0.7701	0.8207	0.8100	0.8319	0.8143	0.8216
Observations	13,720	11,084	4,729	2,882	24,926	16,931	7,574	5,411
Panel B: Alternative alcohol culture measures								
	POIs within 10km		POIs within 3km		POIs within 1km		Baidu index	
	Explicitly control for relocation dummy	Exclude relocation firms	Explicitly control for relocation dummy	Exclude relocation firms	Explicitly control for relocation dummy	Exclude relocation firms	Explicitly control for relocation dummy	Exclude relocation firms
Drinking culture × SOE	-0.0043***	-0.0029***	-0.0051***	-0.0043***	-0.0040***	-0.0028*	-0.0239***	-0.0158*
	(0.0010)	(0.0011)	(0.0011)	(0.0013)	(0.0015)	(0.0014)	(0.0076)	(0.0093)

Drinking culture	0.0021*	0.0035***	0.0020*	0.0025**	0.0004	-0.0002	0.0072	0.0138
	(0.0013)	(0.0013)	(0.0011)	(0.0013)	(0.0013)	(0.0015)	(0.0095)	(0.0127)
SOE	0.0336***	0.0360***	0.0276***	0.0344***	0.0192**	0.0268***	0.1772***	0.1289**
	(0.0092)	(0.0113)	(0.0086)	(0.0107)	(0.0083)	(0.0103)	(0.0525)	(0.0636)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.8096	0.8319	0.8097	0.8319	0.8095	0.8318	0.8107	0.8325
Observations	25,024	16,957	25,024	16,957	25,024	16,957	24,814	16,794

Table 8. Instrumental Variable Estimates

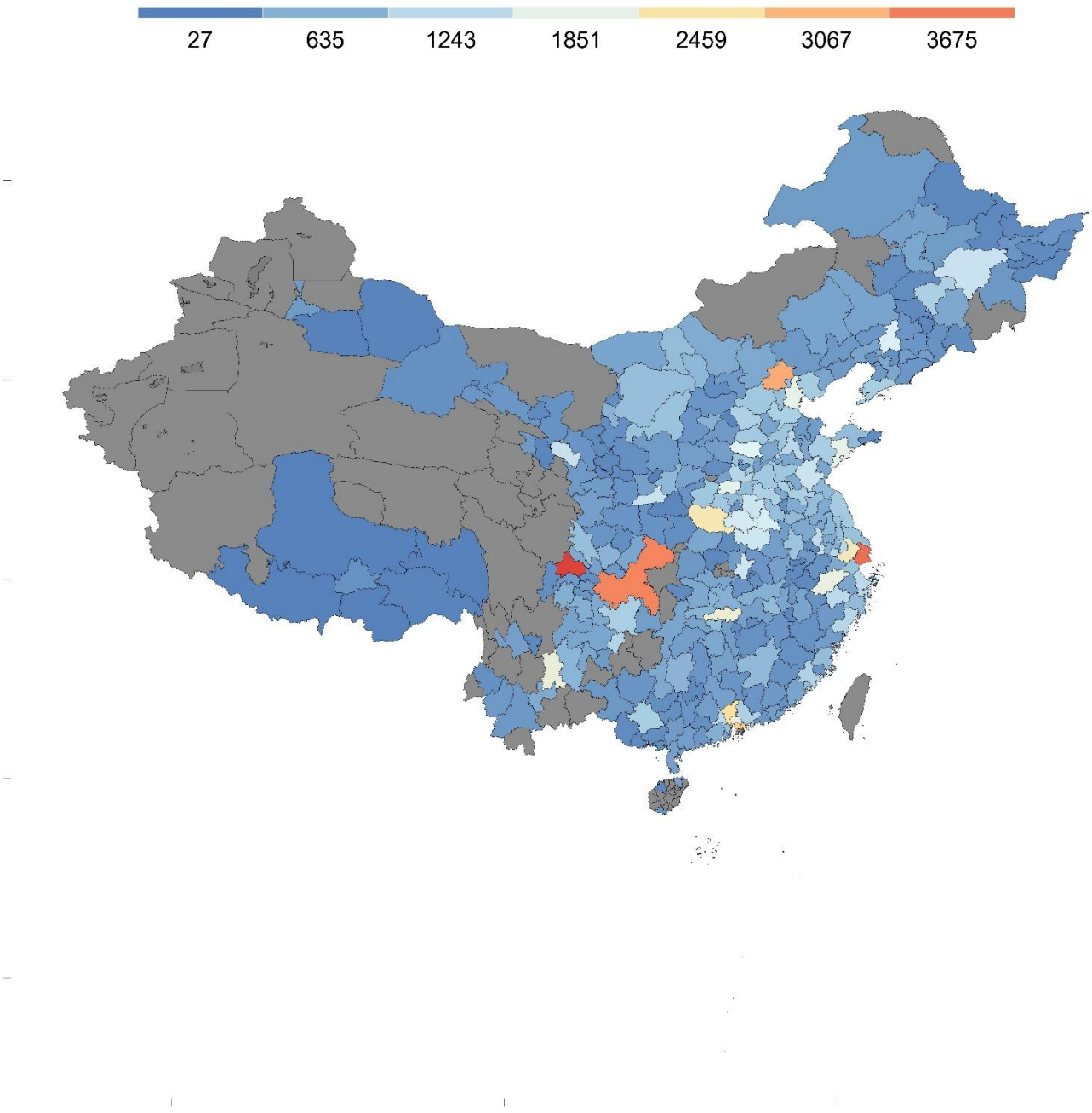
This table reports two-stage least squares (2SLS) estimates examining the causal effect of drinking culture on firm leverage. The instrumental variable (Bartik IV) is constructed as the interaction between province-level sorghum suitability from the FAO–IIASA Global Agro-Ecological Zones (GAEZ v4) database and the log relative price of sorghum to maize from the World Bank Global Economic Monitor (GEM) Commodities database. To account for the potential endogeneity of both Drinking culture and its interaction with SOE, we instrument these variables using the Bartik IV and its interaction with the SOE indicator. Columns (1) and (2) report first-stage regressions for Drinking culture and Drinking culture × SOE, respectively. The Sanderson–Windmeijer F-statistics assess the strength of the excluded instruments for each endogenous regressor. The Kleibergen–Paap rk LM statistic tests for underidentification, while the Kleibergen–Paap rk Wald F-statistic evaluates weak instrument concerns. The Anderson–Rubin test provides weak-instrument-robust inference for the joint significance of endogenous regressors. Column (3) reports the second-stage results, where the dependent variable is next-period leverage. All regressions include firm and year fixed effects as well as industry-by-year fixed effects. Standard errors are clustered at the firm level and reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	First stage		**Second Stage**
	(1) Drinking culture	**(2) Drinking culture × SOE**	**(3) Leverage**
Sorghum Suitability × Relative Price Shock	0.310*** (0.1238)	–2.7472*** (0.1400)	
Sorghum Suitability × Relative Price Shock × SOE	0.3316*** (0.1019)	7.834*** (0.1086)	
Drinking culture × SOE			-0.0047** (0.0021)
Drinking culture			-0.0583** (0.0297)
SOE			0.0260** (0.0118)
Controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes
Observations	16,782	16,782	16,782
Clusters	3,415	3,415	3,415
Sanderson and Windmeijer F-stat	14.37***	30.77***	
Kleibergen-Paap rk LM (p-val)		14.80 (0.0001)	
Kleibergen-Paap rk Wald F		7.18	
Anderson-Rubin test p-val		0.0000	



(a) year of 2012

Figure 1. Geographic Distribution of Drinking Culture across Cities



(b) year of 2022

Figure 1. Geographic Distribution of Drinking Culture across Cities (continued)

Appendix A Variable Definitions

Variable	Definition	Source
Leverage	Total liabilities divided by total assets	CSMAR
Short-term leverage	Short-term liabilities divided by total assets	CSMAR
Long-term leverage	Long-term liabilities divided by total assets	CSMAR
Drinking culture	Measure of regional alcohol intensity based on the number of alcohol-related POIs within a 5-kilometre radius of the firm's headquarters	Pipixia database
POIs within 10km	Number of alcohol-related POIs within a 10-kilometre radius of firm headquarters	Pipixia database
POIs within 3km	Number of alcohol-related POIs within a 3-kilometre radius of firm headquarters	Pipixia database
POIs within 1km	Number of alcohol-related POIs within a 1-kilometre radius of firm headquarters	Pipixia database
Baidu index	Baidu search index related to alcohol consumption at the city level	Baidu Index
SOE	Indicator variable equal to one if the firm is state-owned, and zero otherwise	CSMAR
Relocate	Indicator variable equal to one if the firm relocates its headquarters during the sample period	CSMAR / Manual collection
ROA	Net income divided by total assets	CSMAR
Size	Natural logarithm of total assets	CSMAR
Age	Number of years since firm establishment	CSMAR
Tangibility	Net fixed assets divided by total assets	CSMAR
Sales growth	Annual percentage change in operating revenue	CSMAR
Female manager	Proportion of female executives in top management	CSMAR
Independent director ratio	Proportion of independent directors on the board	CSMAR
Separation	Separation between control rights and cash flow rights	CSMAR
Duality	Indicator equal to one if CEO and board chair positions are held by the same person	CSMAR
Cash holdings	Cash and cash equivalents divided by total assets	CSMAR
Net debt change	Annual change in total interest-bearing debt scaled by lagged total assets	CSMAR
Capital investment	Capital expenditures divided by total assets	CSMAR
R&D investment	R&D expenditure divided by total assets	CSMAR
COD1	Financial expenses divided by total liabilities	CSMAR
COD2	Sum of interest, commissions, and other financial	CSMAR

Variable	Definition	Source
	expenses divided by total liabilities	
COD3	Interest expenses divided by the average interest-bearing debt during the fiscal year	CSMAR
Cost of equity (OJ)	Implied cost of capital estimated using the Ohlson–Juettner model	CSMAR + analyst forecast data
Cost of equity (PEG)	Implied cost of capital estimated using the PEG model	CSMAR + analyst forecast data
Cost of equity (MPEG)	Implied cost of capital estimated using the modified PEG model	CSMAR + analyst forecast data
Cost of equity (CAPM)	Expected return estimated using the Capital Asset Pricing Model	CSMAR
Bank loans	Short-term and long-term bank borrowing divided by total assets	CSMAR
Trade credit	Accounts payable and notes payable divided by total assets	CSMAR
Bond financing	Outstanding corporate bonds divided by total assets	CSMAR
Other liabilities	Total liabilities excluding bank loans, trade credit, and bond financing, divided by total assets	CSMAR
Sorghum Suitability × Relative Price Shock	Interaction between province-level sorghum suitability (FAO–IIASA GAEZ v4) and the log relative price of sorghum to maize (World Bank GEM)	FAO–IIASA GAEZ; World Bank GEM

Appendix B1. IV Estimates: Robustness to Alternative Samples and Measures

This table reports second-stage two-stage least squares (2SLS) estimates examining the robustness of the baseline results to alternative sample restrictions and alternative measures of drinking culture. The endogenous variables, Drinking culture and its interaction with SOE, are instrumented using the Sorghum Suitability × Relative Price Shock and its interaction with SOE. The first-stage results are reported in Table 8 of the main text. All regressions include firm fixed effects, industry-year fixed effects, and year fixed effects. Control variables are identical to those used in the baseline specification. Standard errors are clustered at the firm level and reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Exclude COVID-19 period	Exclude Deleverage period	Exclude financial firms	Exclude firms with many subsidiaries	POIs within 10km	POIs within 3km	POIs within 1km	Baidu index
Drinking culture	-0.0036*	-0.0445**	-0.0044**	-0.0098**	-0.0090***	-0.0151***	-0.0397***	-2.3509***
× *SOE*	(0.0022)	(0.0217)	(0.0022)	(0.0040)	(0.0016)	(0.0036)	(0.0098)	(0.6149)
Drinking culture	-0.0302	0.1202	-0.0607**	-0.0371	-0.0243*	0.0464*	0.0743**	3.7165*
	(0.0295)	(0.1118)	(0.0303)	(0.0392)	(0.0130)	(0.0257)	(0.0341)	(2.0697)
SOE	0.0198	0.0849	0.0245**	0.0372	0.0470***	0.0686***	0.0442***	0.1190***
	(0.0127)	(0.0549)	(0.0118)	(0.0290)	(0.0119)	(0.0163)	(0.0125)	(0.0330)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,540	6,983	16,714	3,937	16,782	16,782	16,782	13,417
Clusters	3,306	2,574	3,404	1,061	3,415	3,415	3,415	3,279

Table B2. IV Estimates: Demand-Side and Maturity Mechanisms

This table reports second-stage 2SLS estimates examining whether the demand-side mechanisms and debt maturity effects documented in the main text remain robust when using instrumental variables. The dependent variables include cash holdings, net debt change, capital investment, R&D investment, short-term leverage, and long-term leverage. Drinking culture and Drinking culture × SOE are instrumented using the Sorghum Suitability × Relative Price Shock and its interaction with SOE. The first-stage results are presented in Table 8. All regressions include firm fixed effects, industry-year fixed effects, and year fixed effects. Control variables are identical to those in the baseline specification. Standard errors are clustered at the firm level.

	(1)	(2)	(3)	(4)	(5)	(6)
	Cash holdings	Net debt change	Capital Investment	R&D investment	Short-term leverage	Long-term leverage
Drinking culture × *SOE*	0.0037***	-0.0048**	0.0004	0.0256	-0.0021*	-0.0035
	(0.0011)	(0.0019)	(0.0006)	(0.0438)	(0.0011)	(0.0026)
Drinking culture	0.0015	-0.0228*	-0.0046	-0.1882	-0.0133	0.0364
	(0.0139)	(0.0130)	(0.0085)	(0.7975)	(0.0097)	(0.0327)
SOE	-0.0186**	0.0053	-0.0076***	-0.1788	0.0103	0.0031
	(0.0075)	(0.0137)	(0.0029)	(0.2339)	(0.0076)	(0.0135)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,480	14137	16782	14,325	14177	16779
Clusters	3,366	0.0839	3,415	3,062	3,129	3,415

Table B3. IV Estimates: Heterogeneity by Formal Institutional Quality

This table reports second-stage 2SLS estimates examining whether the heterogeneous effects across regions with different levels of formal institutional development remain robust to instrumental variable estimation. Provinces are classified as high or low formal institutional quality based on the median provincial marketisation index. Drinking culture and Drinking culture × SOE are instrumented using the Sorghum Suitability × Relative Price Shock and its interaction with SOE. First-stage results are reported in Table 8 of the main text. All specifications include firm fixed effects, industry-year fixed effects, and year fixed effects. Control variables follow the baseline specification. Standard errors are clustered at the firm level.

	(1)	(2)
	High quality	Low quality
$Drinking\ culture \times SOE$	-0.0054	-0.0107***
	(0.0046)	(0.0030)
Drinking culture	-0.0435	0.0540*
	(0.1087)	(0.0282)
SOE	0.0171	0.0477***
	(0.0218)	(0.0160)
Controls	Yes	Yes
Industry-year FE	Yes	Yes
Firm FE	Yes	Yes
Year FE	Yes	Yes
Observations	5,528	7,029
Clusters	1,443	1,587

Table B4. IV Estimates: Decomposition of Leverage by Debt Type

This table reports second-stage 2SLS estimates decomposing leverage into bank loans, trade credit, bond financing, and other liabilities. The endogenous regressors, Drinking culture and Drinking culture × SOE, are instrumented using the Sorghum Suitability × Relative Price Shock and its interaction with SOE. The first-stage regressions are reported in Table 8. All regressions include firm fixed effects, industry-year fixed effects, and year fixed effects. Control variables are identical to those used in the baseline specification. Standard errors are clustered at the firm level.

	(1)	(2)	(3)	(4)
	Bank Loans	Trade credit	Bond Financing	Other Liabilities
$Drinking\ culture \times SOE$	-0.0019	-0.0012	-0.0005	-0.0055**
	(0.0017)	(0.0016)	(0.0005)	(0.0027)
Drinking culture	0.0018	0.0031	0.0057	-0.0256
	(0.0249)	(0.0230)	(0.0079)	(0.0223)
SOE	-0.0125	0.0052	-0.0016	0.0486***
	(0.0092)	(0.0086)	(0.0027)	(0.0179)
Controls	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	16,782	16,782	16,782	16,782
Clusters	3,415	3,415	3,415	3,415