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Collectivism and the Costs of High Leverage

Abstract

Prior literature shows that high leverage is associated with losses in market share due to unfavorable actions by customers and competitors. Building on this literature, we investigate the effect of collectivism on the product market performance of highly leveraged firms. Using a sample of 46 countries over the 1989–2016 period, we find significantly lower costs of high leverage for countries with higher collectivism scores. Moreover, we find that the impact of collectivism on high leverage costs is more pronounced for firms with high product specialization and with financially healthy rivals. In additional analysis, we find that collectivism helps highly leveraged firms retain employees and obtain trade credit from suppliers. Our findings thus suggest that a country's culture affects corporate financial outcomes by influencing the actions of firm stakeholders.

Key Words: Collectivism; National Culture; Costs of High Leverage; Stakeholder Theory; Predation Theory

JEL Classification: G32

1. Introduction

Prior literature on capital structure and product market interactions suggests that high leverage leads to substantial stakeholder-induced deadweight costs that adversely affect firm product market performance.[1,2] First, high leverage can lead to lower sales (Maksimovic and Titman, 1991; Titman, 1984), as customers anticipate that the firm will face strong incentives to cut costs (e.g., by reneging on warranties or reducing product quality). High leverage can therefore lead to a customer-driven loss of market share. Second, high leverage can lead to predatory attacks from competitors (Bolton and Scharfstein, 1990; Opler and Titman, 1994; Chevalier, 1995) and thus to a competitor-driven loss of market share. In this paper we extend the literature on the costs of high leverage to a cross-country setting and examine the role of national culture on the link between capital structure and product market performance.

Culture refers to the "unwritten codes of conduct" (North, 1990, p. 4) that guide decisions and behaviors in a country. We focus on the role of Hofstede's (2001) collectivism/individualism dimension of culture[3] as this dimension is a fundamental driver of differences across countries

[1] Following Freeman (1984), we define stakeholders as those entities that affect or are affected by a firm's decisions. This definition includes entities that have implicit or explicit contracts with the firm, such as customers, suppliers, and employees, as well as those that have no contracting relation with the firm but nonetheless influence the firm, such as competitors.

[2] The literature identifies two types of high leverage costs: 1) agency costs of high leverage, the costs of underinvestment and risk-shifting (Jensen and Meckling, 1976; Myers, 1977), and 2) stakeholder-related costs of high leverage, the costs of unfavorable stakeholder actions. In this paper we follow the framework of Campello (2006) and examine the effect of culture on the second type of high leverage costs.

[3] In our analysis, we control for the effects of Hofstede's (2001) other dimensions of national culture,

(Markus and Kitayama, 1991; Triandis, 2001) and, as we argue below, has a theoretical link to high leverage. In individualist countries, agents tend to emphasize the individual's needs over the collective interest (Miller, 1994), to exhibit overconfidence (Gelfand et al., 2002; Heine et al., 1999; Markus and Kitayama, 1991; Odean, 1998), and to respond more to calculative than moral incentives (Etzioni, 1975; Hofstede, 2001). In collectivist countries, in contrast, agents tend to suppress their inner attributes, avoid standing out, and are more morally driven.

Building on the theory of incomplete contracts, we argue that under the condition of high leverage, the coordination function of formal institutions is less efficient and thus the informal constraints of culture can play a more important role in affecting firm outcomes. First, because a highly leveraged firm has incentives to cut costs by reneging on its implicit contracts with customers, and these implicit contracts have little legal standing, customers avoid making purchases from highly leveraged firms. We expect collectivism to reduce these customer-driven costs of high leverage by constraining opportunism on the part of highly leveraged firms, as reneging on implicit contracts with customers may be perceived as immoral. In addition, to the extent that customers in collectivist countries are more willing to support firm survival, they may be more patient with highly leveraged firms struggling to meet their obligations in difficult times. Second, because imperfect financing contracts limit the ability of highly leveraged firms to raise external funds, these firms' competitors have incentives to take predatory actions against the firm. We expect collectivism to reduce these competitor-driven costs of high leverage by constraining opportunism on the part of highly leveraged firms' competitors, as preying on weak firms may be perceived as unethical. In addition, to the extent that firms in collectivist countries exhibit less

namely, uncertainty avoidance, masculinity, and power distance.

overconfidence bias, they may engage in less predatory behavior as investments in this strategy can yield negative returns if they fail to drive the highly leveraged firm out of the market.

To empirically examine the role of collectivism on the costs of high leverage, we employ Hofstede's (2001) widely used collectivism/individualism index and we capture the costs of high leverage by regressing industry-adjusted sales growth, a measure of a firm's growth in market share, on a high-leverage dummy. In our primary analysis we follow Campello (2006) and set the high-leverage dummy to one if in a given year the firm's long-term debt ratio is in the top three deciles in the country in which the firm is headquartered. A more negative coefficient on the high-leverage dummy would indicate more adverse actions from customers and competitors and thus greater costs associated with high leverage.[4] Using a large sample of 241,906 firm-year observations from 46 countries over the 1989–2016 period, we document significantly lower costs of high leverage in countries with higher collectivism scores.

To address the sensitivity of our result to using the three-decile cutoff in constructing the high-leverage dummy, we rerun our main analysis following Opler and Titman (1994) and set the high-leverage dummy to one for top-decile leverage observations and zero for bottom-decile observations. Using this more extreme proxy for high-leverage firms, we continue to find significantly lower costs of high leverage in countries with higher collectivism scores.

Next, we examine whether the effect of collectivism on the costs of high leverage is greater for firms likely to face more severe costs of high leverage, namely, firms that produce highly specialized products (i.e., whose customers would suffer more from firm losses and thus respond more negatively to high leverage) and firms in low-debt industries (i.e., whose competitors have

[4] Positive (negative) industry-adjusted sales growth implies that the firm's market share is increasing (decreasing).

greater financial ability to prey on a highly leveraged firm). We find that the effect of collectivism on high leverage costs is more pronounced for firms with high product specialization and for firms with financially healthy rivals, that is, firms likely to experience more severe costs of high leverage.

To shed additional light on the effect of collectivism on high leverage costs, we employ the framework of Opler and Titman (1994) and study the product market performance of a group of firms with high ex-ante leverage in industry downturns. The results suggest that collectivism further reduces the costs of high leverage in periods of industry distress. We also conduct a two-step estimation procedure that helps disentangle the influence of culture from that of other country-level characteristics. We find that the effect of collectivism continues to hold after controlling for other dimensions of national culture, as well as for variables related to a country's economic, legal, and political environments. These results lend further support to the view that collectivism reduces the costs of high leverage.

In robustness tests, we use firm fixed effects to control for unobserved time-invariant firm characteristics and we use propensity score matching to address self-selection into high leverage. In addition, we address concerns related to an unbalanced sample, variable measurement, and alternative explanations. The negative relation between collectivism and high leverage costs remains unchanged.

We conduct two sets of additional analyses. First, we consider whether the mitigating effect of collectivism on high leverage costs also works through stakeholder groups other than customers and competitors, in particular, through suppliers and employees (Titman, 1984). We find that both supplier- and employee-driven leverage costs are significant and that the beneficial role of collectivism extends to both of these channels. Moreover, the effect of collectivism is more pronounced for firms that lack employee or supplier relation policies, which suggests that

employees and suppliers may act more aggressively towards these firms. These results together with our main evidence suggest that collectivism mitigates the costs of high leverage by influencing the behaviors of various stakeholders—not only customers and competitors, but also employees and suppliers. Second, we consider the effect of collectivism on high leverage costs in countries with weak formal institutions, that is, in countries where contracts cannot efficiently regulate the behaviors of market participants. We find that in these countries, collectivism exerts greater influence on the costs of high leverage. This finding suggests that culture plays a more important role than formal institutions in influencing the product market performance of highly leveraged firms.

Our study contributes to the growing literature on culture and finance (Guiso, Sapienza, and Zingales, 2008; Chui, Titman, and Wei, 2010; Shao, Kwok, and Guedhami, 2010; Gorodnichenko and Roland, 2011; Eun, Wang, and Xiao, 2015; Karolyi, 2016; Griffin et al., 2017). Prior studies suggest that culture shapes firms' outcomes by influencing investors' and managers' subjective perceptions and behaviors. For example, trust affects perceptions of the risk of being cheated and in turn stock market participation decisions (Guiso et al., 2008); overconfidence and self-attribution biases lead to the use of momentum trading strategies (Chui et al., 2010); an emphasis on not deviating from others' behaviors leads to similar trading patterns and hence higher stock return co-movement (Eun et al., 2015); and conservativism conditions managers to be self-disciplined, reducing the need for leverage as a disciplinary device (Chui, Lloyd, and Kwok, 2002; El Ghoul et al., 2018). Our findings extend this literature by showing that in addition to affecting firm outcomes by conditioning investors' and managers' behavior, culture imposes informal constraints on the behaviors of suppliers, customers, competitors, and employees.[5] Thus, our

[5] This result is consistent with Maksimovic (1995), who argues that firms' financial outcomes are

analysis of the interactions between capital structure and product market performance sheds new light on the role of national culture in conditioning the behavior of key firm stakeholder groups.

Our paper also contributes to the literature on capital structure and product market performance. Prior studies focus largely on the consequences of high leverage, with little attention paid to the factors that mitigate high leverage costs. An exception is Bae et al. (2019), who find that for a sample of U.S. firms corporate social responsibility alleviates customer dissatisfaction and competitor predation associated with high leverage. To the best of our knowledge, ours is the first international study to show that the informal constraints associated with culture also influence the costs of high leverage. Our findings suggest that by affecting the interactions between a firm and its key stakeholders, national culture as captured by collectivism/individualism mitigates the costs of high leverage.

Finally, our paper adds to the literature on the costs of high leverage (e.g., Opler and Titman, 1994; Campello, 2003, 2006; El Ghoul et al., 2019) by documenting the costs driven by various stakeholder groups. Extant research focuses largely on the behavior of highly levered firms' customers (e.g., Matsa, 2011; Kini, Shenoy, and Subramaniam, 2017) and competitors (e.g., Bolton and Scharfstein, 1990; Chevalier, 1995). Our study provides the first empirical analysis of the behavior of not only these commonly studied stakeholder groups but also other relatively overlooked stakeholders (i.e., employees and suppliers).[6]

influenced by various stakeholder groups.

[6] One notable exception is Cohn and Wardlaw (2016), who find higher employee injury rates with increased leverage.

The rest of this paper is organized as follows. Section 2 describes our sample and variables. Section 3 presents results of our empirical analysis on the relation between collectivism and the costs of high leverage. Section 4 concludes the paper.

2. Sample and variables

2.1. Sample construction

To examine the impact of culture on the costs of high leverage, we compile data from six sources: 1) Compustat, which we use to construct firm-level financial variables; 2) Hofstede (2001), which we use to obtain cultural indices; 3) the World Development Indicators (WDI) database, which we use to construct country-level economic development variables; 4) Djankov et al. (2008), which we use to obtain a country's revised anti-director rights index; 5) International Country Risk Guide (ICRG), which we use to obtain a country's law and order index; and 6) Fraser Institute's Economic Freedom of the World (EFW), which we use to construct a country's legal system and property rights index.

To construct the sample, we start with Compustat North America and Global for the period 1987–2016. We exclude firm-year observations with negative total assets and sales, missing equity, or long-term debt-to-assets less (greater) than zero (one). We also omit firm-years with asset growth or sales growth greater than 200% to control for outliers. Following prior research, we further remove financial firms (SIC codes between 6000 and 6999) and utilities (SIC codes between 4900 and 4999). We classify industries according to Campbell (1996). To further ensure that our industry or country means are not biased by outliers, we require each country-industry-year to have no fewer than four observations and each country to have no fewer than ten observations. These filters lead to an initial sample of 492,402 observations that represent 40,906 unique firms from 77 countries. We next merge this sample with Hofstede's (2001) cultural indices,

WDI, Djankov et al. (2008), ICRG, and EFW to obtain our main explanatory variables. We exclude firm-years with missing values for variables used in the main regression. The final sample comprises an unbalanced panel of 241,906 observations representing 29,068 firms from 46 countries over the period 1989–2016.

2.2. Measuring national culture

Our measure of national culture comes from Hofstede (2001), whose framework is arguably the most influential of the various cultural classifications in cross-cultural research (Kirkman, Lowe, and Gibson, 2006) and is employed extensively in prior finance studies (e.g., Chui et al., 2010; Gorodnichenko and Roland, 2011; Eun et al., 2015). As we discuss above, we employ Hofstede's individualism/collectivism index (*IDV*) as our main measure of national culture. This index, which captures the strength of ties among people in a community, is based on a survey of IBM employees that asked them to rate their 1) work-life balance, 2) physical work environment (good ventilation and lighting, adequate workspace, etc.), 3) job security, and 4) degree of variety and adventure on the job. Higher ratings in areas 1) and 4) and lower ratings in areas 2) and 3) suggest higher individualism (lower collectivism). For ease of interpretation, we construct collectivism (*COL*) as an index equal to (100 – *IDV*). In additional analysis, we also examine Hofstede's (2001) three other cultural dimensions, namely, uncertainty avoidance (*UAI*), masculinity (*MAS*), and power distance (*PDI*). Detailed variable definitions are provided in Appendix A.

2.3. Measuring the costs of high leverage

Campello (2006) finds a negative relation between high leverage and relative-to-rival sales growth.[7] We extend Campello's (2006) model to measure the costs of high leverage in a cross-

[7] Campello's (2006) main model, which is used to test for a non-monotonic relation between leverage and

country setting. Specifically, we estimate the following specification:

$$SALES\_G_{i,c,t} = \lambda_0 + \lambda_1 HLEV_{i,c,t-2} + \lambda_2 SIZE_{i,c,t} + \sum_{k=1}^{2} \lambda_{3k} PROFIT_{i,c,t-k} + \sum_{k=1}^{2} \lambda_{4k} INVESTMENT_{i,c,t-k} + \sum_{k=1}^{2} \lambda_{5k} SELLEXP_{i,c,t-k} + \lambda_6 DEVELOPED_c + \lambda_7 GDP_{c,t} + \lambda_8 INFLATION_{c,t} + \lambda_9 LEGAL_c + \varepsilon_{i,c,t}, \quad (1)$$

where *i*, *c*, and *t* index firms, countries, and years, respectively. Our outcome variable, *SALES_G*, captures both the purchasing behavior of customers and the predation behavior of competitors. We expect a decrease in sales growth if customers choose not to purchase from a highly leveraged firm or if competitors attempt to take over the market share of the highly leveraged firm. Our measure of high leverage, *HLEV*, is a dummy variable equal to one in a given year if the firm's long-term debt ratio is in the top three deciles in the country in which the firm is headquartered. A positive coefficient on *HLEV* (λ_1) indicates higher sales growth for the highly leveraged firm thus lower costs of high leverage.[8]

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sales growth, is not our focus. Rather, because we are interested in the effect of high leverage, we use the model in Campello (2006) that revisits the work of Opler and Titman (1994).

[8] One might ask why a firm would choose to have high leverage if high leverage is costly. With this in mind, we follow prior research (e.g., Opler and Titman, 1994) and assume that otherwise-identical firms choose different leverage ratios. This assumption is motivated by Maksimovic and Zechner (1991), who argue that firms in the same industry are indifferent between a high-leverage/high-risk strategy and a low-leverage/low-risk strategy, and by Opler and Titman (1994), who argue that otherwise-identical firms may simultaneously choose a high-leverage/tax-advantage strategy and a low-leverage/cheap-assets-acquisition strategy during industry downturns. This assumption also finds empirical support in our propensity score matching analysis, where we match each high-leverage firm to a low-leverage firm that shares similar

Note that if firms anticipate greater costs of high leverage, they may adjust their debt financing downward. In this case, reverse causality problems could arise. Two features of our model mitigate this concern. First, since firms can more readily adjust short-term debt compared to long-term debt, we rely only on the long-term debt ratio when calculating *HLEV* (following Campello, 2006). Second, *HLEV* is lagged two years relative to the year in which *SALES_G* is measured (the base year), which implies that debt adjustment in response to firm performance is less likely to take place.

Our choice of the firm-level control variables is motivated by Campello (2006). Specifically, we control for firm size (*SIZE*), the natural logarithm of total assets; profitability (*PROFIT*), operating earnings plus depreciation divided by total assets; investment (*INVESTMENT*), capital expenditures over total assets; and selling expenses (*SELLEXP*), the ratio of advertising and selling expenses to total sales. At the country level, we include a developed country indicator (*DEVELOPED*), GDP growth (*GDPG*), inflation (*INFLATION*), as well as the strength of a country's legal regime (*LEGAL*) to account for potential macroeconomic influences.

Consistent with common practice (Opler and Titman, 1994; Campello, 2003, 2006), we use the relative measurement method when calculating the firm-level variables in Equation (1). Specifically, a firm's *HLEV* is measured relative to its country peers,[9] and the other firm-level

characteristics. To preview the results, *HLEV* continues to load significantly negatively on *SALES_G* with an impact of similar magnitude.

[9] Employing the relative measurement method to measure *HLEV* mitigates concerns about a high correlation between collectivism and leverage (Chui et al., 2002), the two components of the interaction term discussed in Section 3.1.1. As Table 1, Panel A suggests, for each country around 30% of firm-year observations are highly levered, which means that country-level variables such as collectivism are not likely

variables are constructed relative to their country-industry-year means. This method accounts for the fact that firm-level variables are determined in part by peer performance or financial condition. Since peer performance is beyond a given firm's control, relative-to-peer variables are less subject to endogeneity (Campello, 2003, 2006). To control for the influence of outliers, we winsorize *PROFIT*, *INVESTMENT*, and *SELLEXP* at the 1% and 99% levels.

2.4. Descriptive statistics

Table 1 presents descriptive statistics for the key variables used in our analysis (before country-industry-year adjustment) by country (Panel A) and for the full sample (Panel B). The sample distribution in Panel A exhibits a fair amount of variation. Similar to other cross-country studies, we find that the U.S. and Japan account for the largest percentage of firm-year observations (22.9% and 15.2%, respectively); in robustness tests we show that this unbalanced sample does not drive our main findings. Table 1, Panel C presents pairwise correlation coefficients between the variables used in our analysis. We find that the correlations between the variables are relatively low, suggesting that multicollinearity is not a serious issue in our tests.

Insert Table 1 about here

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3. Empirical analysis

Building on extant literature, in Section 3.1 we conduct our main analysis on the effects of collectivism on customer- and competitor-driven costs of high leverage, and we provide additional evidence based on the framework of Opler and Titman (1994) and a two-step estimation approach.

to significantly influence *HLEV*. Consistent with this view, Table 1, Panel C shows that the correlation between *COL* and *HLEV* is minimal (0.01).

In Section 3.2 we present results of robustness checks. In additional analyses in Section 3.3, we examine whether collectivism influences high leverage costs through employees and suppliers in addition to competitors and customers, and in Section 3.4, we examine whether the impact of collectivism is more pronounced in weak legal environments.

3.1. Collectivism and the costs of high leverage

3.1.1. Main analysis

We start by measuring the costs of high leverage in a cross-country setting based on the framework of Campello (2006). Model 1 of Table 2 presents ordinary least squares (OLS) results for Equation (1). To mitigate concerns that observations from the same firm are autocorrelated across years, we cluster *t*-statistics at the firm level.[10] We find that the high-leverage dummy (firm-years with a long-term debt ratio in the top three deciles of the country in which the firm is headquartered) enters the regression with a negative coefficient that is statistically significant at

[10] One could also adjust standard errors for clustering at the country level to account for within-country dependence. However, because of the relatively few countries in our sample and the few observations for some countries, clustering standard errors at the country level may suffer from the problem of "too few clusters", which would lead to biased standard errors (Cameron and Miller, 2015; Petersen, 2009). Replicating our main analysis in Table 2 using standard errors clustered by country and by country and year yields lower significance levels. The results are reported in the Internet Appendix Tables IA1 and IA2. Because of the too few clusters problem, the results presented in Appendix Tables IA1 and IA2 are of questionable statistical validity, but are presented to give a sense of the potential relative impact of a more complex cross-firm, within-country correlated error structure. While the problem of too few clusters make exact inference impossible, the results give some confidence that our main results are not driven by a more complex underlying error structure.

the 1% level, which implies that high leverage is costly. The control variables exhibit significant coefficients that are consistent with our expectations: firm size, profitability, investment, and selling expenses are positively related to sales growth while the developed country indicator is negatively related to sales growth.

To examine the effect of collectivism and other dimensions of national culture on the costs of high leverage, we first estimate Equation (1) for each country to obtain country-specific estimates of the costs of high leverage, λ_1. Figure 1 plots the estimated costs of high leverage against collectivism. The upward-sloping regression line provides initial evidence that collectivism helps mitigate the costs of high leverage.

Insert Figure 1 about here

Next, we augment Equation (1) by adding *COL* and its interaction with *HLEV*. Specifically, we run the following model:

$$\begin{aligned} SALES\_G_{i,c,t} = {} & \beta_0 + \beta_1 COL_c \times HLEV_{i,c,t-2} + \beta_2 COL_c + \beta_3 HLEV_{i,c,t-2} + \beta_4 SIZE_{i,c,t} \\ & + \sum_{k=1}^{2} \beta_{5k} PROFIT_{i,c,t-k} + \sum_{k=1}^{2} \beta_{6k} INVESTMENT_{i,c,t-k} + \sum_{k=1}^{2} \beta_{7k} SELLEXP_{i,c,t-k} \\ & + \beta_8 DEVELOPED_c \times HLEV_{i,c,t-2} + \beta_9 DEVELOPED_c + \beta_{10} GDPG_{c,t} \times HLEV_{i,c,t-2} \\ & + \beta_{11} GDPG_{c,t} + \beta_{12} INFLATION_{c,t} \times HLEV_{i,c,t-2} + \beta_{13} INFLATION_{c,t} + \beta_{14} LEGAL_c \\ & \times HLEV_{i,c,t-2} + \beta_{15} LEGAL_c + \varepsilon_{i,c,t}. \qquad (2) \end{aligned}$$

Here we are interested in the coefficient on *COL*×*HLEV*, β_1. If collectivism reduces the costs of high leverage as we predict, β_1 should be positive and significant. To help distinguish the effect of collectivism on high leverage costs from the effects of other country characteristics, we control for the interactions between *HLEV* and the country-level variables *DEVELOPED*, *GDPG*, *INFLATION*, and *LEGAL*.

The results are reported in Model 2 of Table 2. We find a positive and significant coefficient on *COL×HLEV*. Economically, increasing collectivism from the first (e.g., Denmark) to the third (e.g., Mexico) quartile is associated with a 1.3% increase in highly leveraged firms' relative-to-industry sales growth two years later. This result is consistent with our prediction that the costs of high leverage are lower in collectivist countries.

In Model 3 of Table 2, we examine whether our main evidence holds using a more extreme measure of high leverage. Recall that our main measure of high leverage is a dummy equal to one if a firm's leverage ratio in a given year is in the top three deciles of the full sample. To address the concern that the three-decile cutoff might be arbitrary, we follow Opler and Titman (1994) and assign the value of one to top-decile leverage observations and zero to bottom-decile observations. Comparisons based on this definition are thus between extremely high-leveraged firms and extremely low-leveraged firms. We expect that under this more extreme definition of high leverage, the effect of collectivism on high leverage costs should be more pronounced. As can be seen in Model 3, extremely high-leveraged firms experience larger losses in market share, and the ability of collectivism to mitigate the losses associated with extremely high leverage is more pronounced (the coefficient on *COL×HLEV* is almost double that in the baseline model, going from 0.028 to 0.041). This finding lends further support to our prediction that collectivism is associated with lower costs of high leverage.

Insert Table 2 about here

3.1.2. The effect of culture on the actions of customers and competitors

Our main theoretical argument holds that in an incomplete contracts environment, collectivism allows highly leveraged firms to retain customers and protects highly leveraged firms

from the predatory actions of competitors. In Table 3 we examine whether the effect of collectivism on the costs of high leverage is more pronounced for firms whose customers and competitors are more sensitive to firms' use of high leverage.

Focusing first on customers, prior studies show that when customers purchase highly specialized products, they have more to lose if the firm fails to honor its implicit contracts (Opler and Titman, 1994). Because highly leveraged firms face strong incentives to renege on their implicit contracts, we therefore predict that customers are particularly likely to avoid purchasing from these firms. To proxy for the degree of product specialization, we use R&D expenditures (Titman and Wessels, 1988). A firm is classified as having high (low) product specialization if its R&D-to-sales ratio is above (below) the sample median two years before the base year. Models 2 to 3 of Table 3 show that the effect of collectivism on high leverage costs is indeed stronger in the high-product-specialization subsample. Thus, consistent with our prediction, this finding suggests that the effect of collectivism on high leverage costs is more pronounced for firms that are likely to experience more adverse actions from customers (i.e., to suffer a larger customer-driven loss in market share).

Turning to competitors, predation is more likely if competitors are financially healthy (Campello, 2003), as financially sound competitors can fund predatory activities (e.g., reduce prices) more easily. Following Campello (2003) and Campello and Fluck (2006), we employ the industry-average debt level to proxy for the financial condition of a firm's competitors. In particular, we classify the industry peers of a highly leveraged firm as financially unhealthy (healthy) if the industry average long-term debt ratio is greater than (less than or equal to) the median of the overall sample two years before the base year. In Models 4 and 5 of Table 3 we find that the effect of collectivism on high leverage costs is stronger for industries with more aggressive

competitor predation, suggesting that competitor actions also drive our main results.

Insert Table 3 about here

To summarize, the results above show that the effect of collectivism on high leverage costs operates through firms' customers and competitors.

3.1.3. Additional evidence: Applying the framework of Opler and Titman (1994)

To provide further evidence on our findings based on Campello's (2006) framework, in this section we rely on the model of Opler and Titman (1994), which focuses on the product market performance of a group of firms with high ex-ante leverage in industry downturns. This model provides a natural experiment to test whether our main evidence holds after introducing an unexpected shock of industry distress. In addition, this model allows us to investigate the conditions under which different stakeholders have stronger reactions, which allows for a better understanding of the roles of customers and competitors in driving the costs of high leverage. We extend Opler and Titman's (1994) evidence from the U.S. to an international setting by adding *COL* and country-level controls as follows:

$$\begin{aligned} SALES\_G_{i,c,t} = {} & \delta_0 + \delta_1 COL_c \times INDUSTRY\ \ DISTRESS_{i,c,t} \times HLEV_{i,c,t-2} \\ & + \delta_2 INDUSTRY\ \ DISTRESS_{i,c,t} \times HLEV_{i,c,t-2} + \delta_3 COL_c \times INDUSTRY\ \ DISTRESS_{i,c,t} \\ & + \delta_4 COL_c \times HLEV_{i,c,t-2} + \delta_5 COL_c + \delta_6 INDUSTRY\ \ DISTRESS_{i,c,t} + \delta_7 HLEV_{i,c,t-2} \\ & + \delta_8 LOG(SALE)_{i,c,t-2} + \delta_9 PROFITABILITY_{i,c,t-2} + \delta_{10} INVESTMENT_{i,c,t-2} \\ & + \delta_{11} ASSET\ \ SALE_{i,c,t-2} + \delta_{12} DEVELOPED_c \times HLEV_{i,c,t-2} + \delta_{13} DEVELOPED_c \\ & + \delta_{14} GDPG_{c,t} \times HLEV_{i,c,t-2} + \delta_{15} GDPG_{c,t} + \delta_{16} INFLATION_{c,t} \times HLEV_{i,c,t-2} \\ & + \delta_{17} INFLATION_{c,t} + \delta_{18} LEGAL_c \times HLEV_{i,c,t-2} + \delta_{19} LEGAL_c + \varepsilon_{i,c,t}. \end{aligned} \quad (3)$$

The variables *SALES_G*, *COL*, and *HLEV* are defined as in our baseline model (Table 2). We use

all firm- and industry-level controls from Opler and Titman (1994): *INDUSTRY DISTRESS*, a dummy set to one for industry-years with negative mean sales growth and mean stock returns below -30%; *LOG(SALE),* the natural logarithm of total sales; *PROFITABILITY,* operating earnings over total assets; *INVESTMENT,* capital expenditures over total assets; and *ASSET SALE*, asset sales over total assets. Similar to our baseline model, the firm-level variables are adjusted relative to their country-industry-year means. Our country-level controls follow the baseline model.

Table 4, Model 1 reports the results from estimating Equation (3). We find that the coefficient on $COL \times INDUSTRY\ \ DISTRESS \times HLEV$ is significantly positive, which suggests that collectivism further reduces the costs of high leverage in periods of industry distress. This finding lends support to our main evidence based on Campello's (2006) framework. Notice that this finding reflects the joint actions of customers and competitors. To understand the actions of each group separately, we follow the analysis in Table 3 and conduct subsample tests based on the degree of product specialization and the financial condition of the firm's competitors. Similar to the arguments above, we expect the effect of collectivism on the costs of high leverage during periods of industry distress to be greater for firms that produce highly specialized products and for firms in low-debt industries. Models 2 and 3 of Table 4 show that the impact of collectivism on high leverage costs is statistically significant in the high-product-specialization (coef=0.793; *t*-stat=1.97) and low-industry-debt (coef=1.104; *t*-stat=1.88) subsamples, but insignificant in the low-product-specialization (coef=0.309; *t*-stat=0.51) and high-industry-debt (coef=0.531; *t*-stat=1.24) subsamples. These results further support our prediction that collectivism reduces high leverage costs by conditioning the actions of customers and competitors.

Insert Table 4 about here

3.1.4. Additional evidence: Using two-step estimation[11]

To better assess the role of culture and other country-level characteristics in influencing high leverage costs, we employ a two-step analysis. In the first step, each year we regress *SALES_G* on the interactions between *HLEV* and 46 separate country dummies, as well as on a set of controls. Specifically, we estimate the following regression:

$$SALES\_G_{i,c,t} = \varphi_0 + \varphi_1 HLEV_{i,c,t-2} + \varphi_2 SIZE_{i,c,t} + \sum_{k=1}^{2} \varphi_{3k} PROFIT_{i,c,t-k} + \sum_{k=1}^{2} \varphi_{4k} INVESTMENT_{i,c,t-k} + \sum_{k=1}^{2} \varphi_{5k} SELLEXP_{i,c,t-k} + \mu_c \times HLEV_{i,c,t-2} + \varepsilon_{i,c,t}, \quad (4)$$

where μ_c is a vector of country fixed effects. A positive coefficient on *HLEV* (φ_1) indicates higher sales growth for the highly leveraged firm, hence lower costs of high leverage. This regression yields coefficients on the interactions of *HLEV* with the 46 country dummies in each year. Panel A of Table 5 reports the averages of these coefficients across the 46 countries, and Figure 2 plots them against collectivism. In Figure 2 the regression line is upward sloping, which suggests that firms in high-collectivism countries exhibit lower costs of high leverage. This evidence provides further support to the findings in Table 2.

Insert Figure 2 about here

In the second step, we regress the coefficients from the first step on various country-level characteristics. Specifically, we estimate the following regression model:

[11] We thank an anonymous referee for suggesting this analysis.

$$\mu_c \times HLEV_{i,c,t-2}$$

$$= \omega_0 + \omega_1 CULTURAL\ \ ENVIRONMENT_c + \omega_2 ECONOMIC\ \ ENVIRONMENT_{c,t}$$

$$+ \omega_3 LEGAL\ \ AND\ \ POLITICAL\ \ ENVIRONMENT_{c,t} + \varepsilon_{c,t}. \qquad (5)$$

In this regression we include country-level variables related to the cultural, economic, legal, and political environment. The cultural environment variables include our key test variable collectivism (*COL*) as well as the other cultural dimensions of Hofstede (2001), namely, uncertainty avoidance (*UAI*), masculinity (*MAS*), and power distance (*PDI*). Uncertainty avoidance captures the extent to which individuals feel anxiety when facing unpredictable situations. In high-*UAI* societies, customers may prefer not to purchase from highly leveraged firms out of fear of getting low-quality products, which would increase the costs of high leverage, while competitors may be more conservative out of fear of predation not succeeding, which would decrease the costs of high leverage. Masculinity captures the extent to which individuals emphasize male assertiveness and material success. In high-*MAS* societies, customers may tend to leave financially weak firms and competitors may be more aggressive in preying on financially weak firms. Power distance captures the extent to which people challenge hierarchies and inequality. It is ex-ante unclear how power distance would affect the costs of high leverage, and thus we consider the role of power distance to be an empirical question.

Turning to the economic environment, we include a developed country indicator (*DEVELOPED*), GDP growth (*GDPG*), inflation (*INFLATION*), and stock market capitalization to GDP (*STOCK MARKET DEVELOPMENT*). With respect to the legal and political environments, we control for the strength of a country's legal regime (*LEGAL*), the perceived ability of a country's citizens to participate in the selection of their government (*VOICE AND ACCOUNTABILITY)*, political stability and absence of violence (*POLITICAL STABILITY*), the perceived extent to which public power is exercised for private gain (*CONTROL OF*

CORRUPTION), the perceived quality of public service and its independence from political pressures (*GOVERNMENT EFFECTIVENESS*), the extent to which individuals are free to work, produce, consume, and invest, with this freedom protected by the state (*ECONOMIC FREEDOM*), the level of government expenditures as a percentage of GDP (*SIZE OF GOVERNMENT*), and the extent of government enterprises and investment (*GOVERNMENT INVESTMENT*).

We run eight specifications of Equation (5) that include different combinations of the cultural, economic, legal, and political environments variables. The results are reported in Panel B of Table 5. We are mainly interested in the effect of collectivism on high leverage costs in the presence of other country-level factors. In Model 1 we include *COL* only. In Model 2 we add Hofstede's other three cultural dimensions (*UAI*, *MAS*, and *PDI*). In Model 3 (Model 4), we augment Model 1 by adding the economic (legal and political) environment variables. In Model 5 (Model 6), we augment Model 2 by controlling for the economic (legal and political) environment variables. Model 7 augments Model 1 by including the economic and legal environment variables. The horse-race regression in Model 8 includes collectivism as well as all other cultural, economic, legal, and political environment variables.[12]

Across all eight models, we find that *COL* loads positively and significantly at the 5% level or better. Interestingly, among the other cultural variables, we find that the coefficient on *UAI* is consistently negative and significant. This result is in line with the argument above that in high-*UAI* societies, customers may avoid purchasing products from highly leveraged firms due to

[12] One may be concerned about the possibility of multicollinearity in regressions with a large number of independent variables (for example, in Tables 4 and 5). However, the mean values of the variance inflation factors (VIF) are lower than the threshold value of 10, which suggests that multicollinearity is not a major concern.

concerns of getting low-quality products. Taken together, the results from this two-step analysis reinforce our main evidence that collectivism mitigates high leverage costs.[13]

Insert Table 5 about here

3.2. Robustness tests

Firm fixed effect models. Omitted time-invariant firm characteristics may be correlated with high leverage and sales growth, which in turn could drive our results. To address this possibility, we report results of firm fixed effect models in Internet Appendix Table IA3, Models 1 and 2. In these models, all variables are unadjusted (without de-meaning).[14] Model 1 includes all firm observations. Model 2 includes only those firms that experience a change in high leverage status over the sample period. We find that *COL*×*HLEV* continues to load significantly at the 1% level, which suggests that our main results are not driven by omitted unobserved firm characteristics.

Self-selection into high leverage. Firms' choice of high leverage may not be a random decision. To address potential self-selection, we use propensity score matching. We first employ a Probit model to predict the choice of high leverage based on firm- and country-level characteristics. Specifically, we regress *HLEV* on the full set of control variables, including firm size (*SIZE*), profitability (*PROFIT*), investment (*INVESTMENT*), selling expenses (*SELLEXP*), the developed country indicator (*DEVELOPED*), GDP growth (*GDPG*), inflation (*INFLATION*), as well as the

[13] In Figure 3, we plot the relation between collectivism and the residuals from the second-step regression minus *COL*. The regression line is moderately upward-sloping, lending further support to the findings in Table 2.

[14] The results are qualitatively similar when we de-mean the variables as in the baseline model.

strength of a country's legal regime (*LEGAL*).[15] We then match each highly leveraged firm to the less leveraged firm with the closest propensity score. Model 3 of Table IA3 reports the results. Our main finding continues to hold, which suggests that self-selection into high leverage does not drive our results.

Sample composition. Similar to other cross-country studies, our sample is unbalanced across countries. As shown in Table 1, U.S. and Japanese firms account for the largest percentage of firm-year observations at 22.9% and 15.2%, respectively. To mitigate concerns that our main finding is driven by sample composition biases, in Table IA4, Panel A we re-estimate our baseline regressions after sequentially excluding U.S. firms, Japanese firms, and firms from both countries. In addition, we run a weighted regression in which each country is assigned a weight equal to the reciprocal of its number of observations. The results show significant positive loadings of *COL*×*HLEV* on *SALES_G*, mitigating concerns about sample composition biases.[16]

Alternative proxies. We next consider whether our main evidence on the link between collectivism and high leverage costs is sensitive to alternative proxies for high leverage and collectivism. Recall that our main measure of high leverage is two-year lagged *HLEV*. In Table IA4, Panel B we instead lag *HLEV* by three years. We find that while the impact of collectivism on high leverage costs weakens after three years, it is still significant.

Turning to alternative proxies for *COL*, we first use the collectivism index of Tang and

[15] To address potential omitted country-level characteristics related to the cultural, economic, legal, and political environment, we repeat the propensity score matching after also including proxies for omitted country-level characteristics in the leverage selection model. The results continue to go through.

[16] In unreported tests, we further find that our main evidence holds over the pre- and post-global financial crisis periods.

Koveos (2008), who update Hofstede's index by incorporating the changing economic environment within each country (*COL_TK*). We also use the Institutional Collectivism (*COL_INST*) measure from the GLOBE database constructed by House et al. (2004). The results reported in Table IA4, Panel C based on these alternative measures of collectivism continue to be consistent with collectivism reducing the costs of high leverage.

Alternative explanations. One alternative explanation for our main empirical result is firm exit bias. Firms that go out of business are not tracked by Compustat. As a result, the firms in Compustat are surviving firms, that is, firms that tend to be good performers with low costs of high leverage. If either *COL* or *HLEV* is correlated with firms' exit rate, then the observed relation between collectivism and high leverage costs could simply reflect firm exit bias. To address this concern, in Table IA5, Panel A, we examine the mean rate of firm exits based on Compustat item DLRSN (reason for deletion). We find that highly leveraged firms are more likely to exit the sample. This implies that, if anything, our high-leverage sample should be biased toward better-performing (i.e., surviving) firms, which would work against documenting a negative relation between high leverage and sales growth. Thus, our evidence on high leverage costs is not likely to be explained by firm exit bias. When we empirically investigate whether the relation between collectivism and high leverage costs is driven by firm exit bias, we indeed find in Table IA5, Panel B, that firms in high collectivism countries have a significantly lower probability of exiting the sample. The high collectivism sample is therefore biased toward low-performing firms, which works against a negative relation between collectivism and high leverage costs. This suggests that the relation we document between collectivism and high leverage costs is not affected by firm exit bias.

Another alternative explanation for our main result is product market structure. Culture may

be correlated with product market structure if, for instance, industries in high (low) collectivism countries are less (more) competitive. In less competitive environments, customers may have fewer choices and hence may stick with their original product choice regardless of the financial condition of the firm. In this case our evidence of lower costs of high leverage in high collectivism countries may simply reflect less competition.

To test whether our results are driven by this explanation, in Table IA6 we further control for product market structure variables as well as their interactions with high leverage. We employ two types of market structure variables. In Model 1, we use the natural logarithm of the four-firm concentration ratio (*FFC*), which captures the total market share of the four largest firms in an industry. In Model 2, we use the natural logarithm of the Herfindahl–Hirschman index (*HHI*), which captures the degree of market concentration in an industry. We find that the interaction terms *FFC*×*HLEV* and *HHI*×*HLEV* load insignificantly, which suggests that the product market structure explanation is not likely to hold. More importantly, our main interaction *COL*×*HLEV* is positive and statistically significant at the 1% level, consistent with our main evidence.

Overall, the results above reinforce our main finding that collectivism mitigates the costs of high leverage.

3.3. The effect of culture on the actions of employees and suppliers

So far, our results suggest that collectivism reduces the costs of high leverage driven by customers and competitors. Our focus on these two stakeholder groups builds on extant literature on high leverage costs, which generally overlooks the role of other stakeholder groups (e.g., Maksimovic and Titman, 1991; Titman, 1984; Bolton and Scharfstein, 1990; Chevalier, 1995; Opler and Titman, 1994; Campello, 2003, 2006). However, while Titman (1984) and Maksimovic and Titman (1991) focus on the behavior of customers, they argue that their analyses can be applied

to other stakeholder groups such as employees and suppliers.[17] Accordingly, in this section we extend our analysis on the relation between collectivism and the costs of high leverage to include these stakeholder groups. In particular, in the spirit of Titman (1984) and Maksimovic and Titman (1991), we extend the "customer" story to high leverage costs driven by employees and suppliers.

Like customers, employees and suppliers are less likely to do business with highly leveraged firms because they have strong incentives to retain cash flows by cutting those costs not guaranteed in explicit contracts. In the case of employees, high leverage can be costly because highly leveraged firms may cut job training, the quality of the work environment, or salaries and benefits in an effort to increase cash flows.[18] High leverage is therefore expected to induce employees to leave the firm. We conjecture that this effect is stronger for more talented employees in labor-intensive industries because their contracts contain more implicit components such as training and quality of facilities. In the case of suppliers, high leverage can be costly because a highly leveraged firm may have unstable or lower demand for a supplier's products, or may have difficulty making timely payments on trade credit.[19] High leverage should therefore induce suppliers to extend less

[17] Titman (1984) argues that liquidation can impose costs on employees and suppliers in addition to customers. Similarly, Maksimovic and Titman (1991) suggest that while high leverage negatively impacts a firm's ability to ensure product quality, their analysis is applicable to many other types of implicit contracts such as those with suppliers or employees.

[18] For example, according to the *Washington Post* (October 28, 2004, E07), "Delta is seeking $1 billion in pay and benefit cuts from its pilots" because "without the cuts, it would have to file for bankruptcy court protection."

[19] For example, according to *The Economist* (January 22, 2002), "Kmart's suppliers became nervous as they saw the cash run out. Fleming, which supplies food and groceries to the discount chain's 2,100 stores,

trade credit to the firm.

Also, as in the case of customers, we posit that collectivism mitigates unfavorable actions on the part of employees and suppliers with respect to highly leveraged firms, which results in lower costs of high leverage. For example, tight group structures are likely to reduce agency conflicts between a highly leveraged firm and its employees and suppliers, and cultural norms that emphasize other stakeholders' interests are likely to reduce the tendency to behave opportunistically towards employees and suppliers. Accordingly, we hypothesize that, in addition to its effects on the actions of customers and competitors, collectivism mitigates high leverage costs through its effects on the actions of employees and suppliers.

To test these predictions, we re-run our main analysis after replacing the dependent variable (*SALES_G*) with employee growth (*EMPLOYEE_G*) and accounts payable growth (*AP_G*) as follows:

$$EMPLOYEE\_G_{i,c,t} \text{ or } AP\_G_{i,c,t}$$
$$= \eta_0 + \eta_1 HLEV_{i,c,t-2} + \eta_2 SIZE_{i,c,t} + \sum_{k=1}^{2} \eta_{3k} PROFIT_{i,c,t-k}$$
$$+ \sum_{k=1}^{2} \eta_{4k} INVESTMENT_{i,c,t-k} + \sum_{k=1}^{2} \eta_{5k} SELLEXP_{i,c,t-k} + \eta_6 DEVELOPED_c$$
$$+ \eta_7 GDPG_{c,t} + \eta_8 INFLATION_{c,t} + \eta_9 LEGAL_c + \varepsilon_{i,c,t}, \qquad (6)$$

stopped making shipments. Other vendors kept their delivery trucks away."

$$EMPLOYEE\_G_{i,c,t} \text{ or } AP\_G_{i,c,t}$$
$$= \gamma_0 + \gamma_1 COL_c \times HLEV_{i,c,t-2} + \gamma_2 COL_c + \gamma_3 HLEV_{i,c,t-2} + \gamma_4 SIZE_{i,c,t}$$
$$+ \sum_{k=1}^{2} \gamma_{5k} PROFIT_{i,c,t-k} + \sum_{k=1}^{2} \gamma_{6k} INVESTMENT_{i,c,t-k} + \sum_{k=1}^{2} \gamma_{7k} SELLEXP_{i,c,t-k}$$
$$+ \gamma_8 DEVELOPED_c \times HLEV_{i,c,t-2} + \gamma_9 DEVELOPED_c + \gamma_{10} GDPG_{c,t} \times HLEV_{i,c,t-2}$$
$$+ \gamma_{11} GDPG_{c,t} + \gamma_{12} INFLATION_{c,t} \times HLEV_{i,c,t-2} + \gamma_{13} INFLATION_{c,t} + \gamma_{14} LEGAL_c$$
$$\times HLEV_{i,c,t-2} + \gamma_{15} LEGAL_c + \varepsilon_{i,c,t}. \qquad (7)$$

Under the employee dimension, we examine *EMPLOYEE_G*, which captures employees' willingness to work for a firm. We classify an industry as a high (low) labor intensity industry in a given year if it has wage-to-capital ratio greater than (less than or equal to) the median of all industries two years before the base year. In Models 1 through 4 of Table 6, Panel A, we find that high leverage is negatively associated with relative-to-industry employee growth. Additionally, an increase in collectivism from the 25th to the 75th percentile allows highly leveraged firms to reduce relative-to-industry employee growth losses by 1.53% (2.52% for high labor intensity industries, 0.81% for low labor intensity industries). These results suggest that employees tend to leave a highly leveraged firm, but are less likely to do so if the firm is in a collectivist country.

Under the supplier dimension, we examine *AP_G*, which captures suppliers' incentives to extend trade credit. In Model 5 of Table 6, Panel A, we find that high leverage significantly lowers accounts payable growth. This result suggests that suppliers are less willing to extend trade credit to highly leveraged firms. Model 6 further shows that increasing collectivism from the 25th to the 75th percentile is associated with 2.39% higher relative-to-industry accounts payable growth for highly leveraged firms, which indicates that collectivism significantly attenuates suppliers' reluctance to extend trade credit.

To shed more light on whether the actions of employees and suppliers ultimately contribute to highly leveraged firms' market share losses, we examine whether collectivism plays a more

important role in curbing such losses when employees and suppliers act more strongly. To capture the actions of employees (suppliers) with respect to a highly leveraged firm, we consider the presence of an employee (supplier) relations policy. If a highly leveraged firm has a policy in place that aims to improve relations with the firm's employees (suppliers), we would expect the adverse actions of employees (suppliers) toward the firm to be less pronounced. In this case, collectivism would play a less important role in curbing employee- and supplier-driven costs. We rely on Thomson Reuters' ASSET4 ESG data to determine whether a firm has an established policy related to employee relations (Does the company describe, claim to have, or mention the processes in place to improve its labor-union relations?) and supplier relations (Does the company describe, claim to have, or mention processes in place to improve its partnership with suppliers and contractors?). As reported in Table 6, Panel B, we find that for firms that do not have policies related to improving employee or supplier relations, collectivism has a strong and significant influence on the costs of high leverage, while such influence is insignificant for firms that do have such policies. These results suggest that in addition to customers and competitors, employees and suppliers also help explain the relation between collectivism and high leverage costs.

Insert Table 6 about here

The results above, together with those reported in Section 3.1, suggest that collectivism reduces high leverage costs driven by customers and competitors, as well as employees and suppliers. These findings thus suggest that national culture affects firm outcomes by simultaneously influencing various stakeholders in the firm and its environment.

3.4. Collectivism, legal institutions, and the costs of high leverage

We posit that in weak legal environments, where contracts cannot efficiently regulate the

behaviors of market participants, collectivism exerts greater influence on the costs of high leverage. High leverage costs capture contracting costs: customer-driven costs arise because highly leveraged firms may renege on implicit contracts with customers, and competitor-driven costs arise because imperfect financing contracts limit the ability of highly leveraged firms to raise external funds, which induces competitors to take predatory actions. Under incomplete contracts (Hart and Moore, 1988; Williamson, 1998), the degree to which these contracting costs can be reduced depends on a country's contracting environment, which includes both formal institutions, such as rule of law and property rights protection, and informal institutions, such as national culture. A country's legal system and culture can act as substitutes in regulating the behaviors of economic agents and hence in reducing the costs of high leverage. For example, in countries with a highly developed legal framework, firms' implicit contracts with customers (e.g., promises on product quality) may turn into explicit contracts (warranties on products sold), in which case high leverage costs would be regulated largely by the legal system. In contrast, in a country with a weak legal system, culture becomes more important in mitigating high leverage costs. We test this idea in Table 7 using two proxies for the strength of a country's legal system: the law and order index from ICRG and the legal system and property rights index from EFW.

A country is defined as having a strong (weak) legal system if its law and order index is greater than (less than or equal to) the median of the overall sample two years before the base year. Similarly, a country is defined as having a strong (weak) legal system and property rights if the legal system and property rights index is greater than (less than or equal to) the median of the overall sample two years before the base year. Consistent with our expectation, Models 2 to 5 of Table 7 show that the effects of collectivism on high leverage costs are significant and more pronounced for firms in countries with a weak legal system, but are insignificant for firms in

countries with a more developed legal system.[20] These findings should be interpreted with caution, however, because as shown at the bottom of Table 7, the difference in the coefficients on *COL*×*HLEV* between the low and high subsamples is not statistically significant.

Insert Table 7 about here

In sum, the results above suggest that collectivism has a significant effect on high leverage costs in an imperfect contracting environment, consistent with our prediction.

4. Conclusion

Prior research suggests that high leverage is costly because highly leveraged firms have incentives to take opportunistic actions that result in a loss of customers, and highly leveraged firms' competitors have incentives to take predatory actions that result in a reduction in sales growth. In this study, we investigate whether national culture as captured by a country's collectivism score mitigates these market share losses of high leverage.

We argue that due to incomplete contracting, a country's culture is an important determinant of the costs of high leverage. Based on a large sample of 241,906 firm-year observations from 46 countries over the 1989–2016 period, we find that collectivism reduces highly leveraged firms' relative-to-industry market share (i.e., sales growth) losses. In particular, the results suggest that, in line with our predictions, customer- and competitor-driven costs of high leverage are lower in

[20] One could argue that these results are an artifact of the effect of national culture on the effectiveness of a country's legal system (Stulz and Williamson, 2003; Licht, Goldschmidt, and Schwartz, 2005). In unreported tests, we repeat our split-sample analysis using the residuals from regressing proxies for the strength of legal protection on collectivism and a set of controls. Our results remain unaffected.

collectivist countries. Subsample tests further show that the effect of collectivism on the costs of high leverage is more pronounced for firms whose customers and competitors are more sensitive to firms' use of high leverage, consistent with Campello (2006) and Opler and Titman (1994). Our main findings are robust to accounting for the unbalanced sample composition as well as to considering other measures of culture and alternative explanations. In additional analysis we build on extant theoretical models of high leverage to examine whether high leverage costs are also driven by employees and suppliers, and if so, whether collectivism reduces the costs of high leverage driven by these stakeholder groups. Using the extended model, we find that collectivism helps highly leveraged firms retain customers, guard against rival predation, retain employees, and obtain trade credit from suppliers. Finally, we provide evidence suggesting that culture plays a more important role than legal institutions in shaping the product market performance of highly leveraged firms. In sum, our analysis on the interactions between capital structure and product market performance improves our understanding of the effect of national culture on the behavior of key firm stakeholder groups and in turn on firm outcomes.

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Figure 1. Collectivism and high leverage costs across countries

This figure plots the relation between a country's collectivism score and the costs of high leverage (λ_1) obtained from estimating Equation (1) for each country. A positive λ_1 indicates higher sales growth for the highly leveraged firm thus lower costs of high leverage. The fitted line shows an upward-sloping trend.

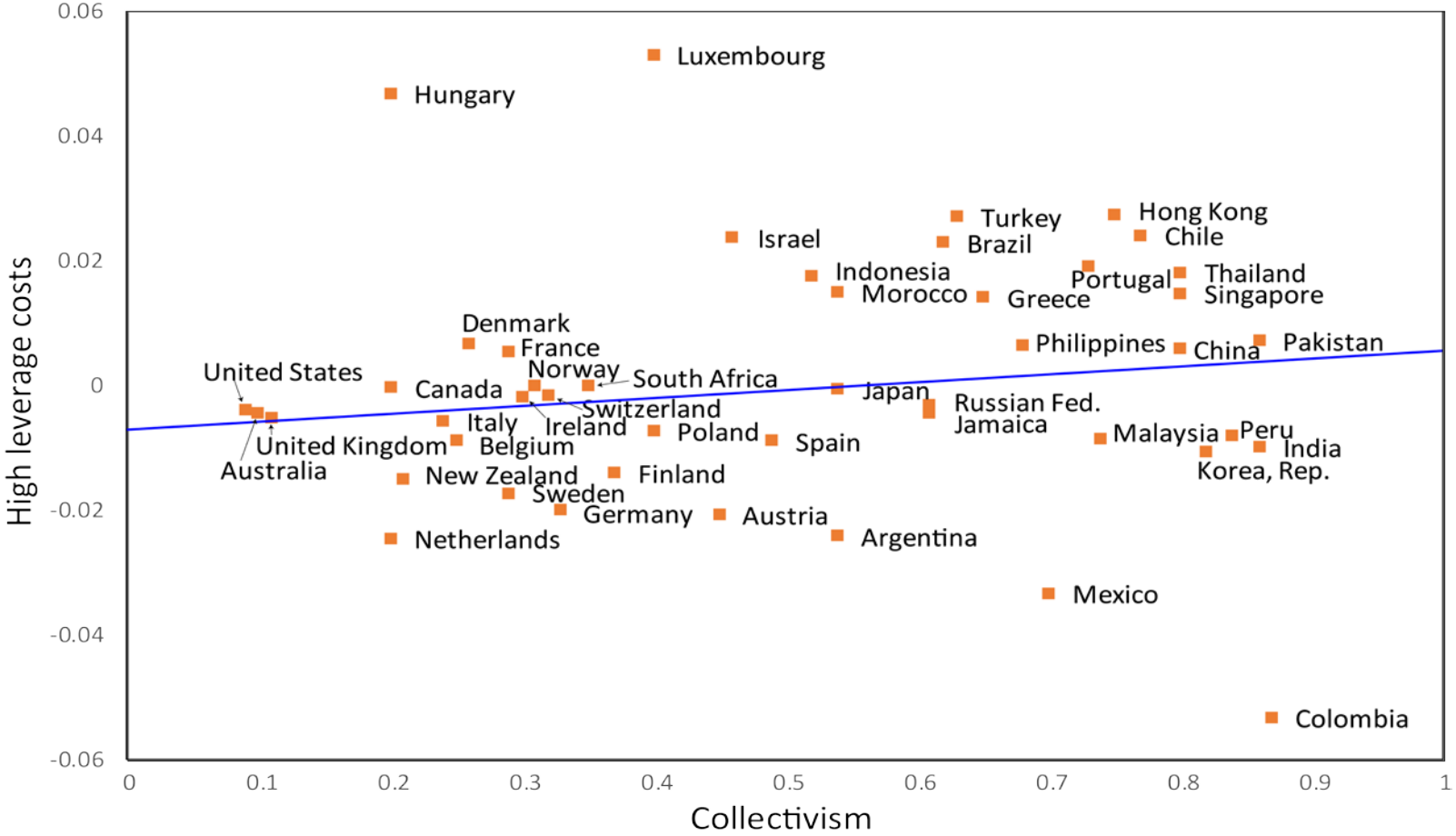

Figure 2. Collectivism and the interactions between high leverage and the country dummies

This figure plots the relation between a country's collectivism score and averages of the coefficients on the interactions between high leverage and the 46 country dummies, where the coefficients come from a regression of *SALES_G* on the interaction terms and a set of controls (Equation (4)). A positive coefficient on the interaction term indicates lower cost of high leverage. The fitted line shows an upward-sloping trend.

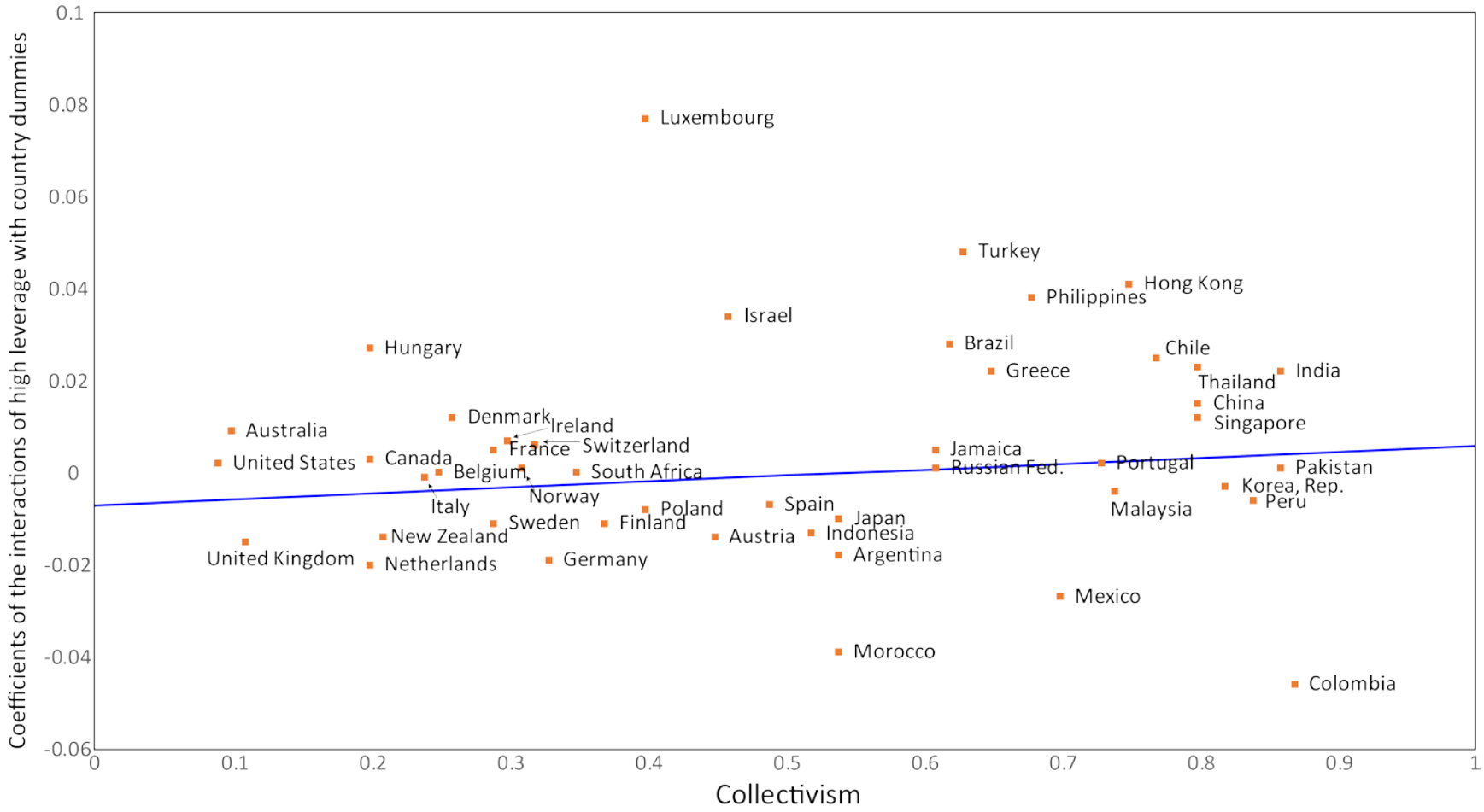

Figure 3. Collectivism and second-step regression residuals (excluding collectivism)

This figure plots a country's collectivism score against its second-step regression residuals, where collectivism is omitted from the independent variables in the second-step regression. The fitted line shows an upward-sloping trend.

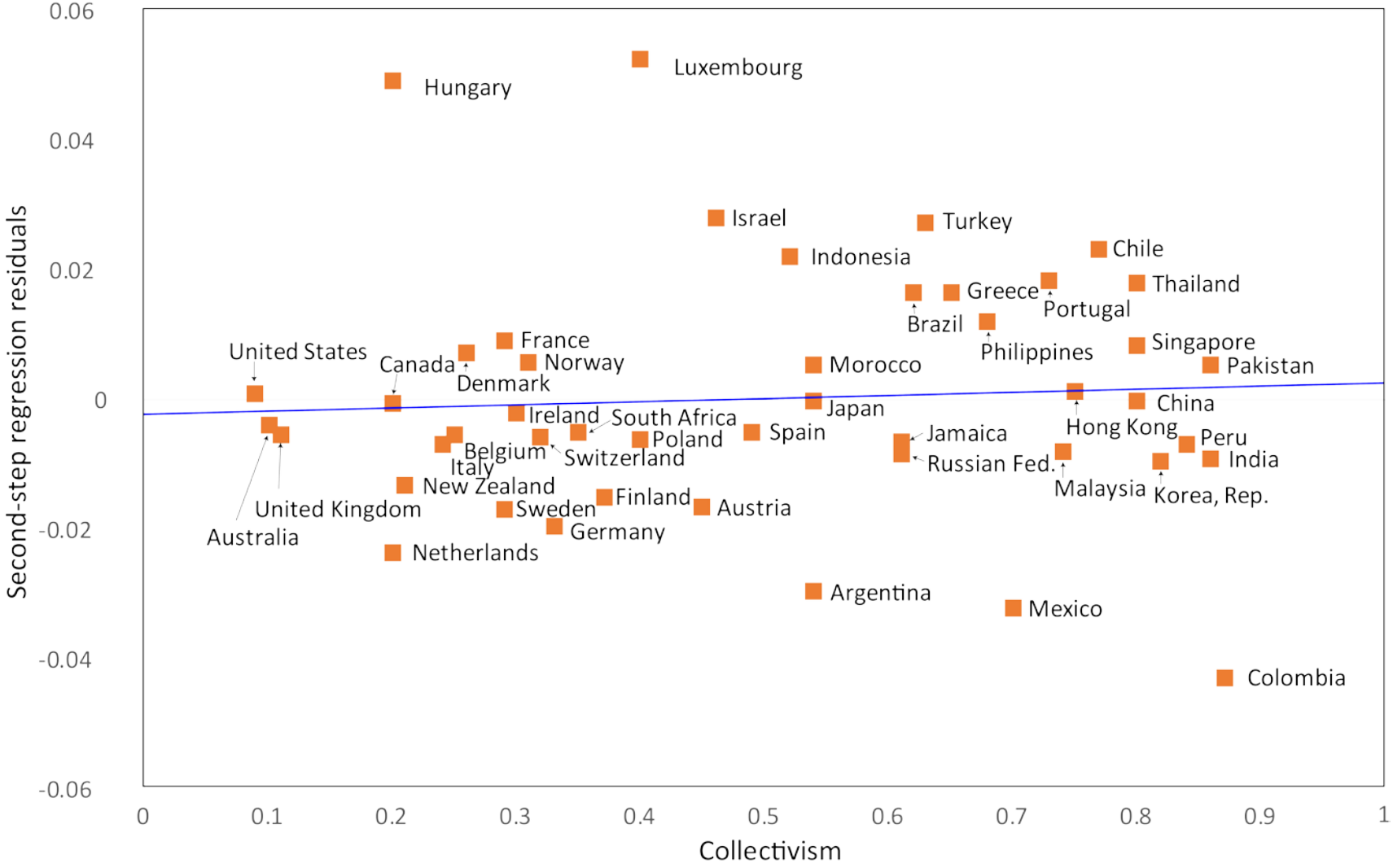

Table 1. Descriptive statistics

Panel A. Descriptive statistics by country

Country	N	$SALES\_G_t$	$EMPLOYEE\_G_t$	AP_G_t	COL_c	PDI_c	UAI_c	MAS_c	$HLEV_t$	$SIZE_t$	$PROFIT_{t-1}$	$PROFIT_{t-2}$	$INVESTMENT_{t-1}$	$INVESTMENT_{t-2}$	$SELLEXP_{t-1}$	$SELLEXP_{t-2}$	$DEVELOPED_c$	$GDP_{c,t}$	$INFLATION_{c,t}$	$LEGAL_c$
Argentina	430	0.07	-0.01	0.10	0.54	0.49	0.86	0.56	0.28	4.83	0.07	0.07	0.05	0.05	0.16	0.16	0.00	1.59	19.46	5.17
Australia	7,757	0.05	0.05	0.06	0.10	0.36	0.51	0.61	0.33	3.81	-0.09	-0.06	0.07	0.07	1.19	1.02	1.00	1.40	2.77	22.41
Austria	695	0.08	0.04	0.08	0.45	0.11	0.70	0.79	0.35	5.97	0.07	0.07	0.06	0.06	0.17	0.16	1.00	1.03	1.76	15.00
Belgium	954	0.07	0.04	0.06	0.25	0.65	0.94	0.54	0.33	6.04	0.07	0.08	0.06	0.06	0.14	0.14	1.00	0.80	1.72	15.00
Brazil	2,466	0.09	0.06	0.13	0.62	0.69	0.76	0.49	0.34	6.32	0.06	0.06	0.06	0.06	0.21	0.21	0.00	1.54	8.13	10.13
Canada	7,850	0.11	0.05	0.10	0.20	0.39	0.48	0.52	0.28	5.13	0.01	0.01	0.09	0.09	0.42	0.40	1.00	1.01	2.15	23.12
Chile	1,281	0.08	0.02	0.11	0.77	0.63	0.86	0.28	0.34	5.84	0.08	0.08	0.06	0.06	0.18	0.18	0.00	3.09	4.93	19.23
China	21,376	0.16	0.05	0.19	0.80	0.80	0.30	0.66	0.30	5.84	0.06	0.06	0.06	0.07	0.18	0.17	0.00	8.78	3.60	4.03
Colombia	115	0.08	0.14	0.17	0.87	0.67	0.80	0.64	0.35	6.62	0.06	0.07	0.04	0.05	0.14	0.14	0.00	3.01	5.87	5.41
Denmark	1,322	0.05	0.02	0.09	0.26	0.18	0.23	0.16	0.30	5.20	0.06	0.06	0.05	0.06	0.28	0.26	1.00	0.65	1.92	24.00
Finland	1,542	0.06	0.02	0.08	0.37	0.33	0.59	0.26	0.25	5.70	0.08	0.08	0.05	0.06	0.13	0.12	1.00	1.04	1.71	21.00
France	6,680	0.07	0.04	0.08	0.29	0.68	0.86	0.43	0.30	5.79	0.05	0.06	0.05	0.05	0.18	0.17	1.00	0.67	1.48	17.32
Germany	6,739	0.07	0.03	0.08	0.33	0.35	0.65	0.66	0.34	5.48	0.05	0.05	0.05	0.05	0.19	0.18	1.00	1.27	1.20	17.60
Greece	1,656	0.01	0.02	0.03	0.65	0.60	1.12	0.57	0.34	5.23	0.02	0.03	0.04	0.04	0.22	0.20	1.00	-1.61	1.22	8.81
Hong Kong	1,066	0.07	0.03	0.07	0.75	0.68	0.29	0.57	0.29	6.13	0.05	0.05	0.04	0.05	0.25	0.23	0.00	3.19	0.98	24.58
Hungary	40	0.10	0.00	0.23	0.20	0.46	0.82	0.88	0.48	5.91	0.08	0.09	0.09	0.10	0.21	0.21	1.00	2.92	5.45	8.07
India	3,271	0.08	0.02	0.11	0.86	0.78	0.48	0.46	0.28	4.91	0.07	0.07	0.06	0.06	0.16	0.15	0.00	3.97	9.55	10.98
Indonesia	17,481	0.12	0.05	0.11	0.52	0.77	0.40	0.56	0.27	4.35	0.08	0.08	0.07	0.08	0.16	0.15	0.00	5.88	5.86	20.14
Ireland	408	0.07	0.02	0.06	0.30	0.28	0.35	0.68	0.34	6.05	0.03	0.04	0.05	0.06	0.26	0.26	0.00	2.61	2.00	30.00
Israel	1,551	0.09	0.06	0.07	0.46	0.13	0.81	0.47	0.29	5.11	0.05	0.05	0.04	0.04	0.29	0.29	0.00	1.80	1.94	20.00
Italy	2,452	0.05	0.04	0.06	0.24	0.50	0.75	0.70	0.33	6.23	0.04	0.05	0.04	0.04	0.14	0.13	1.00	-0.33	1.83	8.19
Jamaica	49	0.01	-0.01	0.02	0.61	0.45	0.13	0.68	0.35	4.67	0.19	0.19	0.04	0.04	0.18	0.18	0.00	0.15	9.72	8.53
Japan	36,780	0.04	0.02	0.04	0.54	0.54	0.92	0.95	0.24	6.09	0.05	0.05	0.03	0.03	0.21	0.21	1.00	0.75	-0.68	22.50
Korea, Rep.	7,555	0.06	0.13	0.07	0.82	0.60	0.85	0.39	0.26	6.00	0.05	0.05	0.05	0.06	0.16	0.16	0.00	3.15	1.93	22.10
Luxembourg	164	0.08	0.05	0.07	0.40	0.40	0.70	0.50	0.30	7.80	0.08	0.08	0.06	0.06	0.24	0.21	1.00	0.80	2.56	12.00
Malaysia	8,500	0.06	0.04	0.08	0.74	1.04	0.36	0.50	0.30	4.35	0.05	0.06	0.04	0.04	0.16	0.15	0.00	3.12	3.49	19.46

Mexico	1,131	0.07	0.05	0.10	0.70	0.81	0.82	0.69	0.33	7.16	0.08	0.08	0.05	0.06	0.20	0.20	0.00	0.94	5.08	6.63
Morocco	170	0.05	0.00	0.05	0.54	0.70	0.68	0.53	0.34	5.27	0.12	0.12	0.06	0.07	0.18	0.17	0.00	2.98	1.22	9.72
Netherlands	1,484	0.07	0.02	0.08	0.20	0.38	0.53	0.14	0.33	6.43	0.07	0.07	0.05	0.06	0.16	0.16	1.00	0.94	1.85	15.00
New Zealand	738	0.10	0.06	0.13	0.21	0.22	0.49	0.58	0.25	4.53	0.06	0.05	0.06	0.06	0.19	0.18	1.00	1.06	2.46	22.27
Norway	1,516	0.09	0.04	0.10	0.31	0.31	0.50	0.08	0.25	5.59	0.04	0.04	0.07	0.07	0.14	0.13	1.00	0.62	3.92	21.00
Pakistan	1,786	0.08	0.01	0.10	0.86	0.55	0.70	0.50	0.28	4.24	0.10	0.10	0.06	0.06	0.08	0.08	0.00	1.92	10.36	12.65
Peru	631	0.11	0.01	0.17	0.84	0.64	0.87	0.42	0.31	5.43	0.11	0.12	0.06	0.06	0.16	0.16	0.00	3.88	2.98	10.79
Philippines	979	0.08	0.02	0.10	0.68	0.94	0.44	0.64	0.27	4.69	0.07	0.07	0.05	0.05	0.20	0.19	0.00	3.55	3.64	9.69
Poland	2,649	0.08	0.06	0.08	0.40	0.68	0.93	0.64	0.34	4.36	0.06	0.07	0.06	0.06	0.19	0.18	1.00	3.77	2.24	8.87
Portugal	419	0.04	0.03	0.06	0.73	0.63	1.04	0.31	0.38	6.49	0.06	0.06	0.04	0.04	0.16	0.14	1.00	0.25	2.06	12.50
Russian Fed.	805	0.09	0.03	0.12	0.61	0.93	0.95	0.36	0.37	7.70	0.11	0.12	0.09	0.09	0.13	0.13	0.00	2.58	12.44	14.63
Singapore	5,398	0.08	0.07	0.09	0.80	0.74	0.08	0.48	0.27	4.62	0.05	0.06	0.05	0.05	0.17	0.15	0.00	3.33	1.21	25.17
South Africa	2,243	0.07	0.04	0.08	0.35	0.49	0.49	0.63	0.33	5.31	0.10	0.10	0.06	0.07	0.16	0.15	0.00	1.43	6.83	11.56
Spain	1,107	0.04	0.05	0.05	0.49	0.57	0.86	0.42	0.38	6.86	0.06	0.07	0.04	0.05	0.17	0.16	1.00	0.51	1.55	24.32
Sweden	3,486	0.09	0.04	0.08	0.29	0.31	0.29	0.05	0.29	4.75	0.03	0.03	0.04	0.04	0.35	0.34	1.00	1.47	1.69	21.00
Switzerland	2,389	0.07	0.04	0.08	0.32	0.34	0.58	0.70	0.27	6.28	0.08	0.08	0.04	0.05	0.23	0.20	1.00	0.92	0.58	15.32
Thailand	5,199	0.07	0.05	0.09	0.80	0.64	0.64	0.34	0.28	4.53	0.09	0.09	0.06	0.06	0.16	0.16	0.00	3.27	2.62	11.27
Turkey	1,180	0.05	0.05	0.13	0.63	0.66	0.85	0.45	0.33	5.93	0.08	0.09	0.06	0.06	0.15	0.15	0.00	3.53	10.01	11.49
United Kingdom	13,001	0.08	0.04	0.07	0.11	0.35	0.35	0.66	0.33	5.13	0.04	0.04	0.05	0.05	0.32	0.32	1.00	1.23	2.33	27.68
United States	55,415	0.08	0.04	0.09	0.09	0.40	0.46	0.62	0.29	5.50	0.01	0.02	0.05	0.06	0.41	0.40	1.00	1.10	2.14	15.82

Panel B. Descriptive statistics for the full sample

	$SALES\_G_t$	$EMPLOYEE\_G_t$	AP_G_t	COL_c	PDI_c	UAI_c	MAS_c	$HLEV_t$	$SIZE_t$	$PROFIT_{t-1}$	$PROFIT_{t-2}$	$INVESTMENT_{t-1}$	$INVESTMENT_{t-2}$	$SELLEXP_{t-1}$	$SELLEXP_{t-2}$	$DEVELOPED_c$	$GDP_{c,t}$	$INFLATION_{c,t}$	$LEGAL_c$
Mean	0.11	0.03	0.11	0.39	0.53	0.56	0.62	0.28	5.24	0.04	0.04	0.06	0.06	0.25	0.25	0.69	2.43	2.59	17.88
Min	-1.00	-0.64	-1.00	0.09	0.11	0.08	0.05	0.00	-6.91	-1.75	-1.75	0.00	0.00	0.00	0.00	0.00	-11.73	-6.01	3.00
Q1	-0.05	-0.05	-0.14	0.09	0.40	0.40	0.52	0.00	3.92	0.03	0.03	0.02	0.02	0.07	0.07	0.00	0.83	0.89	15.00
Median	0.09	0.01	0.07	0.33	0.50	0.46	0.62	0.00	5.19	0.07	0.07	0.04	0.04	0.15	0.15	1.00	1.91	2.29	18.00
Q3	0.24	0.09	0.30	0.54	0.68	0.81	0.66	1.00	6.50	0.11	0.11	0.07	0.07	0.28	0.28	1.00	3.76	3.70	22.50
Max	2.00	1.27	2.00	0.87	1.04	1.12	0.95	1.00	13.08	0.35	0.35	0.39	0.39	6.00	6.00	1.00	13.57	52.85	30.00
SD	0.31	0.23	0.44	0.27	0.19	0.23	0.19	0.45	2.03	0.20	0.19	0.06	0.07	0.49	0.46	0.46	3.53	3.28	6.10

Panel C. Correlation matrix

	$SALES\_G_t$	$EMPLOYEE\_G_t$	AP_G_t	COL_c	PDI_c	UAI_c	MAS_c	$HLEV_t$	$SIZE_t$	$PROFIT_{t-1}$	$PROFIT_{t-2}$	$INVESTMENT_{t-1}$	$INVESTMENT_{t-2}$	$SELLEXP_{t-1}$	$SELLEXP_{t-2}$	$DEVELOPED_c$	$GDP_{c,t}$	$INFLATION_{c,t}$	$LEGAL_c$
$SALES\_G_t$	1																		
$EMPLOYEE\_G_t$	0.42***	1																	
AP_G_t	0.37***	0.30***	1																
COL_c	-0.01***	-0.01**	-0.02***	1															
PDI_c	0.01*	0.00	0.00	0.74***	1														
UAI_c	-0.05***	-0.02***	-0.05***	0.54***	0.28***	1													
MAS_c	-0.05***	-0.02***	-0.05***	0.30***	0.13***	0.65***	1												
$HLEV_t$	0.01**	0.01***	0.00	-0.03***	-0.02***	-0.04***	-0.05***	1											
$SIZE_t$	0.05***	0.06***	0.02***	0.05***	-0.01***	0.14***	0.07***	0.25***	1										
$PROFIT_{t-1}$	0.09***	0.15***	0.07***	0.09***	0.06***	0.03***	-0.01***	0.02***	0.32***	1									
$PROFIT_{t-2}$	0.04***	0.09***	0.04***	0.09***	0.06***	0.03***	-0.01***	0.02***	0.31***	0.64***	1								
$INVESTMENT_{t-1}$	0.08***	0.07***	0.03***	-0.07***	-0.02***	-0.14***	-0.14***	0.13***	0.06***	0.11***	0.15***	1							
$INVESTMENT_{t-2}$	0.09***	0.05***	0.04***	-0.08***	-0.02***	-0.14***	-0.15***	0.13***	0.05***	0.10***	0.11***	0.71***	1						
$SELLEXP_{t-1}$	0.00	-0.04***	-0.01***	-0.16***	-0.12***	-0.10***	-0.02***	-0.08***	-0.26***	-0.50***	-0.45***	-0.03***	-0.03***	1					
$SELLEXP_{t-2}$	0.01***	-0.03***	-0.01**	-0.16***	-0.12***	-0.10***	-0.02***	-0.08***	-0.26***	-0.47***	-0.50***	-0.04***	-0.03***	0.89***	1				
$DEVELOPED_c$	-0.03***	-0.02***	-0.04***	-0.57***	-0.66***	0.23***	0.26***	00.00	0.07***	-0.08***	-0.08***	-0.07***	-0.07***	0.08***	0.08***	1			
$GDPG_{c,t}$	0.16***	0.08***	0.10***	0.23***	0.33***	-0.21***	-0.16***	-0.01***	-0.06***	0.06***	0.02***	0.03***	0.05***	-0.04***	-0.04***	-0.48***	1		
$INFLATION_{c,t}$	0.07***	0.03***	0.06***	-0.02***	0.19***	-0.44***	-0.49***	0.02***	-0.11***	0.05***	0.04***	0.14***	0.14***	0.00	0.00	-0.54***	0.32***	1	
$LEGAL_c$	-0.03***	-0.01**	-0.04***	0.10***	-0.13***	0.16***	0.33***	-0.01***	-0.03***	0.01***	0.01***	-0.05***	-0.05***	-0.03***	-0.03***	0.25***	-0.11***	-0.33***	1

This table reports the summary statistics. Panel A presents the averages of the key variables in the main regression by country. Panel B reports descriptive statistics for the full sample. Panel C shows the correlation matrix for the key variables in the main regression. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. Detailed descriptions of variable definitions and data sources are provided in Appendix A. The full sample comprises 241,906 firm-year observations from 46 countries.

Table 2. Collectivism and the costs of high leverage: Main evidence

	Baseline Model	Top 3 Deciles	Top 1 Decile
	(1)	(2)	(3)
$COL_c \times HLEV_{t-2}$		**0.028*** **	**0.041*** **
		(3.74)	**(2.69)**
COL_c		-0.002	-0.007
		(-0.46)	(-0.73)
$HLEV_{t-2}$	-0.011***	-0.040***	-0.081***
	(-7.72)	(-4.85)	(-5.12)
$SIZE_t$	0.009***	0.009***	0.017***
	(20.87)	(20.97)	(16.95)
$PROFIT_{t-1}$	0.134***	0.135***	0.104***
	(15.48)	(15.49)	(7.78)
$PROFIT_{t-2}$	-0.013	-0.013	-0.016
	(-1.59)	(-1.55)	(-1.30)
$INVESTMENT_{t-1}$	0.276***	0.276***	0.289***
	(15.34)	(15.32)	(8.84)
$INVESTMENT_{t-2}$	0.157***	0.155***	0.129***
	(9.55)	(9.40)	(4.39)
$SELLEXP_{t-1}$	0.003	0.003	0.006
	(0.78)	(0.76)	(1.26)
$SELLEXP_{t-2}$	0.022***	0.021***	0.015***
	(5.42)	(5.38)	(2.79)
$DEVELOPED_c \times HLEV_{t-2}$		0.017***	0.021**
		(3.40)	(2.05)
$DEVELOPED_c$	-0.010***	-0.012***	-0.001
	(-5.01)	(-3.96)	(-0.10)
$GDPG_{c,t} \times HLEV_{t-2}$		0.001	0.002
		(1.09)	(1.41)
$GDPG_{c,t}$	-0.002***	-0.002***	-0.004***
	(-5.79)	(-5.30)	(-5.25)
$INFLATION_{c,t} \times HLEV_{t-2}$		0.002***	0.005***
		(4.00)	(4.64)
$INFLATION_{c,t}$	0.001**	0.000	-0.001
	(2.19)	(0.15)	(-0.94)
$LEGAL_c \times HLEV_{t-2}$		-0.000	0.000
		(-0.29)	(0.45)
$LEGAL_c$	0.000	0.000	-0.001**
	(0.68)	(0.78)	(-2.57)
CONSTANT	0.004	0.007	0.042***
	(1.19)	(1.42)	(4.32)
N	241,906	241,906	73,205
R^2	0.015	0.016	0.017

This table reports OLS regression results for Equations (1) and (2). The dependent variable is *SALES_G*, firm sales growth, which is influenced by customers and competitors. The independent variables include the collectivism score (*COL*), our measure of high leverage (*HLEV*), and firm- and country-level controls. Detailed variable definitions and data sources are provided in Appendix A. Consistent with common practice (Opler and Titman, 1994; Campello, 2003, 2006), we use the relative measurement method when calculating firm-level variables. Specifically, a firm's *HLEV* is measured relative to its country peers, and the other firm-level variables are constructed relative to their country-

industry-year means. Model 1 presents results for Equation (1) on the costs of high leverage. Model 2 presents results for Equation (2) on the effect of collectivism on the costs of high leverage. Model 3 repeats Model 2 using a more extreme definition of high leverage that assigns a value of one to the top-decile firm-year observations and a value of zero to the bottom-decile observations. Comparisons based on this definition are between extremely high-leveraged firms and extremely low-leveraged firms. *t*-statistics in parentheses are based on standard errors clustered at the firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 3. Collectivism and the costs of high leverage: Actions of customers and competitors based on Campello's (2006) model

	Baseline Model	Customer *Product Specialization*		Competitor *Industry Debt Level*	
		High	Low	Low	High
	(1)	(2)	(3)	(4)	(5)
$\boldsymbol{COL_c \times HLEV_{t-2}}$	**0.028*** **	**0.039*** **	**0.019***	**0.052*** **	**0.022****
	(3.74)	**(3.58)**	**(1.78)**	**(2.77)**	**(2.27)**
COL_c	-0.002	-0.000	0.006	-0.015	0.009
	(-0.46)	(-0.05)	(1.06)	(-1.38)	(1.43)
$HLEV_{t-2}$	-0.040***	-0.038***	-0.044***	-0.051***	-0.040***
	(-4.85)	(-3.52)	(-3.49)	(-2.81)	(-3.65)
Controls	Yes	Yes	Yes	Yes	Yes
CONSTANT	0.007	-0.005	0.022***	0.034***	0.006
	(1.42)	(-0.81)	(3.00)	(3.54)	(0.85)
N	241,906	115,287	126,619	91,996	149,910
R^2	0.016	0.018	0.015	0.014	0.019
p-value of difference test		0.095		0.078	

This table reports OLS regression results for Equation (2) using different subsamples related to the costs of high leverage. The dependent variable is *SALES_G*, firm sales growth, which is influenced by customers and competitors. The independent variables include the collectivism score (*COL*), our measure of high leverage (*HLEV*), and firm- and country-level controls. Detailed variable definitions and data sources are provided in Appendix A. Consistent with common practice (Opler and Titman, 1994; Campello, 2003, 2006), we use the relative measurement method when calculating firm-level variables. Specifically, a firm's *HLEV* is measured relative to its country peers, and the other firm-level variables are constructed relative to their country-industry-year means. Model 1 repeats the results of the baseline model using the full sample. In Models 2 and 3, a firm is classified as having high (low) product specialization if its R&D-to-sales ratio is above (below) the sample median two years before the base year. In Models 4 and 5, industries with a high (low) debt level comprise those with an average long-term debt ratio above (below or equal to) the median of the overall sample two years before the base year. The last row reports the *p*-value for the test of difference in the coefficients on *COL*×*HLEV* between the low and high subsamples. *t*-statistics in parentheses are based on standard errors clustered at the firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4. Collectivism and the costs of high leverage: Actions of customers and competitors based on Opler and Titman's (1994) model

		Customer *Product Specialization*		Competitor *Industry Debt Level*	
		High	Low	Low	High
	(1)	(2)	(3)	(4)	(5)
COL$_c$×INDUSTRY DISTRESS$_t$×HLEV$_{t-2}$	**0.650****	**0.793****	**0.309**	**1.104***	**0.531**
	(1.97)	**(1.97)**	**(0.51)**	**(1.88)**	**(1.24)**
INDUSTRY DISTRESS$_t$×HLEV$_{t-2}$	-0.089**	-0.115*	-0.018	-0.139**	-0.073
	(-1.98)	(-1.93)	(-0.25)	(-2.07)	(-1.09)
COL$_c$×INDUSTRY DISTRESS$_t$	-0.327*	-0.346	-0.238	-0.320	-0.466
	(-1.93)	(-1.49)	(-0.78)	(-1.54)	(-1.58)
COL$_c$×HLEV$_{t-2}$	0.109	-0.005	0.377	-0.032	0.197
	(0.78)	(-0.03)	(1.36)	(-0.12)	(1.19)
COL$_c$	0.067	0.102	0.067	0.005	0.142
	(0.79)	(0.92)	(0.49)	(0.04)	(1.27)
INDUSTRY DISTRESS$_t$	0.039*	0.037	0.033	0.040	0.052
	(1.71)	(1.00)	(0.97)	(1.47)	(1.17)
HLEV$_{t-2}$	0.030	0.025	0.034	0.037	0.007
	(1.39)	(0.92)	(0.89)	(0.95)	(0.24)
LOG (SALE)$_{t-2}$	0.002***	0.003***	0.002*	0.006***	-0.001
	(3.52)	(3.37)	(1.91)	(5.57)	(-1.52)
PROFITABILITY$_{t-2}$	0.166***	0.186***	0.155***	0.166***	0.158***
	(21.62)	(14.93)	(15.66)	(17.60)	(11.60)
INVESTMENT$_{t-2}$	0.677***	0.688***	0.615***	0.653***	0.694***
	(24.11)	(20.86)	(11.27)	(14.01)	(20.34)
ASSET SALE$_{t-2}$	-0.800***	-0.721***	-1.088***	-1.041***	-0.679***
	(-18.25)	(-14.37)	(-12.14)	(-14.08)	(-13.20)
GDPG$_{c,t}$×HLEV$_{t-2}$	0.003*	-0.000	0.008***	0.005*	0.003
	(1.79)	(-0.09)	(3.20)	(1.83)	(1.59)
GDPG$_{c,t}$	-0.003***	-0.002	-0.004***	-0.002*	-0.004***
	(-3.20)	(-1.60)	(-2.98)	(-1.67)	(-3.50)
INFLATION$_{c,t}$×HLEV$_{t-2}$	-0.003	-0.001	-0.005	-0.010*	0.002
	(-1.02)	(-0.30)	(-1.02)	(-1.94)	(0.69)
INFLATION$_{c,t}$	0.003**	0.002	0.006**	0.005**	-0.000
	(2.10)	(0.91)	(2.20)	(2.36)	(-0.07)
LEGAL$_c$×HLEV$_{t-2}$	-0.003	-0.001	-0.005	-0.002	-0.002
	(-1.42)	(-0.63)	(-1.50)	(-0.48)	(-1.05)
LEGAL$_c$	-0.001	-0.002	-0.000	0.001	-0.004**
	(-0.98)	(-1.10)	(-0.13)	(0.47)	(-2.36)
CONSTANT	-0.004	-0.003	-0.017	-0.052***	0.067***
	(-0.30)	(-0.14)	(-0.83)	(-2.64)	(3.36)
N	74,303	40,951	33,352	37,201	37,102
R^2	0.046	0.054	0.039	0.046	0.049
p-value of difference test		0.095		0.078	

This table reports OLS regression results for Equation (3) using different subsamples related to the costs of high leverage. The dependent variable is *SALES_G*, firm sales growth, which is influenced by customers and competitors. The independent variables include the collectivism score (*COL*), our measure of high leverage (*HLEV*), an industry distress indicator (*INDUSTRY DISTRESS*), and firm- and country-level controls. Detailed variable definitions and data sources are provided in Appendix A. Consistent with common practice (Opler and Titman, 1994; Campello, 2003, 2006), we use the relative measurement method when calculating firm-level variables. Specifically, a firm's *HLEV* is measured relative to its country peers, and the other firm-level variables are constructed relative to their country-industry-year means. Model 1 repeats the results of the baseline model using the full sample. In Models 2 and 3, a firm is classified as having high (low) product specialization if its R&D-to-sales ratio is above (below) the sample median two years before the base year. In Models 4 and 5, industries with a high (low) debt level comprise those with an average long-term debt ratio above (below or equal to) the median of the overall sample two years before the base year. The last row reports the *p*-value for the test of difference in the coefficients on *COL×HLEV* between the low and

high subsamples. *t*-statistics in parentheses are based on standard errors clustered at the firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 5. Country-level characteristics and the costs of high leverage: Two-step analysis

Panel A. First-step results

Country	Coefficients on Country Dummy×$HLEV_{t-2}$
Luxembourg	0.077
Turkey	0.048
Hong Kong	0.041
Philippines	0.038
Israel	0.034
Brazil	0.028
Hungary	0.027
Chile	0.025
Thailand	0.023
India	0.022
Greece	0.022
China	0.015
Singapore	0.012
Denmark	0.012
Australia	0.009
Ireland	0.007
Switzerland	0.006
France	0.005
Jamaica	0.005
Canada	0.003
United States	0.002
Portugal	0.002
Norway	0.001
Pakistan	0.001
Russian Fed.	0.001
South Africa	0.000
Belgium	0.000
Italy	-0.001
Korea, Rep.	-0.003
Malaysia	-0.004
Peru	-0.006
Spain	-0.007
Poland	-0.008
Japan	-0.010
Finland	-0.011
Sweden	-0.011
Indonesia	-0.013
New Zealand	-0.014
Austria	-0.014
United Kingdom	-0.015
Argentina	-0.018
Germany	-0.019
Netherlands	-0.020

Mexico	-0.027
Morocco	-0.039
Colombia	-0.046

Panel B. Second-step results

	Coefficients on Country Dummy×$HLEV_{t-2}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cultural Environment								
COL_c	**0.011*** (3.92)**	**0.027*** (6.62)**	**0.010** (2.27)**	**0.018*** (3.29)**	**0.021*** (4.05)**	**0.036*** (6.02)**	**0.016*** (2.94)**	**0.034*** (5.41)**
PDI_c		-0.005 (-1.16)			0.001 (0.21)	0.009 (1.42)		0.011* (1.81)
UAI_c		-0.018*** (-4.61)			-0.014*** (-2.85)	-0.016*** (-3.21)		-0.014*** (-2.71)
MAS_c		0.008* (1.86)			0.007 (1.40)	0.007 (1.40)		0.009 (1.60)
Economic Environment								
$DEVELOPED_c$			0.002 (0.68)		0.001 (0.55)		-0.002 (-0.48)	-0.000 (-0.03)
$GDPG_{c,t}$			0.000 (1.08)		-0.000 (-0.02)		0.000 (0.97)	-0.000 (-0.67)
$INFLATION_{c,t}$			0.000 (0.36)		0.000 (0.52)		-0.000 (-0.14)	0.000 (0.26)
STOCK MARKET DEVELOPMENT$_{c,t}$			0.035*** (5.96)		0.029*** (4.99)		0.035*** (4.30)	0.033*** (4.77)
Legal and Political Environment								
$LEGAL_c$				0.000 (0.48)		0.001*** (5.57)	0.000 (0.12)	0.001*** (5.61)
VOICE AND ACCOUNTABILITY$_{c,t}$				-0.006*** (-2.68)		-0.002 (-0.78)	-0.002 (-0.97)	0.001 (0.60)
POLITICAL STABILITY$_{c,t}$				0.006*** (3.30)		0.003* (1.69)	0.005*** (2.94)	0.002 (1.11)
CONTROL OF CORRUPTION$_{c,t}$				0.007** (2.12)		0.014*** (4.62)	0.006* (1.91)	0.014*** (4.44)
GOVERNMENT EFFECTIVENESS$_{c,t}$				-0.005 (-1.50)		-0.014*** (-4.29)	-0.006* (-1.71)	-0.015*** (-4.63)
ECONOMIC FREEDOM$_{c,t}$				-0.031 (-1.64)		-0.071*** (-4.20)	-0.045** (-2.25)	-0.084*** (-4.65)
SIZE OF GOVERNMENT$_{c,t}$				-0.007 (-1.26)		-0.006 (-1.23)	-0.003 (-0.56)	-0.004 (-0.80)
GOVERNMENT INVESTMENT$_{c,t}$				0.002*** (4.43)		0.002*** (6.43)	0.001*** (3.56)	0.002*** (5.55)
CONSTANT	-0.004* (-1.81)	-0.005 (-1.30)	-0.007* (-1.95)	0.004 (0.36)	-0.011** (-2.08)	0.004 (0.29)	0.013 (0.93)	0.008 (0.55)
N	789	789	714	650	714	650	635	635
R^2	0.023	0.101	0.069	0.075	0.136	0.238	0.106	0.273

This table reports OLS regression results for Equations (4) and (5). In the first step, each year we regress *SALES_G* on the interactions between *HLEV* and 46 country dummies and a set of controls. Panel A reports averages of the coefficients across the 46 countries. In the second step, we regress these coefficients on country-level characteristics related to the cultural, economic, and legal and political environments. The results are reported in Panel B. Detailed variable definitions and data sources are provided in Appendix A. *t*-statistics in parentheses are based on standard errors that are heteroskedasticity-consistent. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 6. Collectivism and the costs of high leverage: The role of employees and suppliers

Panel A. Employee and accounts payable growth

	Employee ($EMPL\_G_t$)				Supplier (AP_G_t)	
	Full sample		High labor intensity	Low labor intensity		
	(1)	(2)	(3)	(4)	(5)	(6)
$\boldsymbol{COL_c \times HLEV_{t-2}}$		**0.034*** **	**0.056*** **	**0.018**		**0.053*** **
		(4.61)	**(3.05)**	**(1.08)**		**(5.30)**
COL_c		0.001	-0.014	0.006		-0.005
		(0.30)	(-1.34)	(0.53)		(-0.90)
$HLEV_{t-2}$	-0.015***	-0.040***	-0.057***	-0.032*	-0.011***	-0.053***
	(-11.52)	(-4.39)	(-2.84)	(-1.91)	(-6.05)	(-4.73)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
CONSTANT	0.004*	-0.002	0.011	-0.005	0.004	0.003
	(1.84)	(-0.34)	(1.03)	(-0.46)	(1.53)	(0.56)
N	146,675	146,675	72,861	36,927	234,229	234,229
R^2	0.026	0.026	0.028	0.023	0.008	0.008
p-value of difference test			0.063			

Panel B. Employee and supplier relation policies

	Baseline	Employee Relation Policy		Supplier Relation Policy	
		Yes	No	Yes	No
	(1)	(2)	(3)	(4)	(5)
$\boldsymbol{COL_c \times HLEV_{t-2}}$	**0.028*** **	**-0.025**	**0.030***	**-0.028**	**0.033** **
	(3.74)	**(-0.74)**	**(1.93)**	**(-0.73)**	**(2.29)**
COL_c	-0.002	0.082***	0.031	0.112***	0.019
	(-0.46)	(3.29)	(1.62)	(4.11)	(1.00)
$HLEV_{t-2}$	-0.040***	-0.026	-0.011	-0.039	-0.006
	(-4.85)	(-0.74)	(-0.64)	(-0.82)	(-0.34)
Controls	Yes	Yes	Yes	Yes	Yes
CONSTANT	0.007	-0.032	-0.003	-0.040	-0.001
	(1.42)	(-1.45)	(-0.18)	(-1.37)	(-0.05)
N	241,906	4,171	16,672	3,560	17,283
R^2	0.016	0.015	0.013	0.016	0.013
p-value of difference test		0.070		0.068	

Panel A reports OLS regression results for Equations (6) and (7). The dependent variables are *EMPLOYEE_G* (employee growth) or *AP_G* (accounts payable growth). The independent variables include a country's collectivism score (*COL*), our measure of high leverage (*HLEV*), and firm- and country-level controls. In Models 3 and 4, we classify an industry as a high (low) labor intensity industry in a given year if it has a wage-to-capital ratio greater than (smaller than or equal to) the median of all industries two years before the base year. Panel B reports OLS regression results for Equation (2) using different subsamples related to the presence of employee and supplier relations policies. The dependent variable is *SALES_G*, firm sales growth, which is influenced by customers and competitors. The independent variables include a country's collectivism score (*COL*), our measure of high leverage (*HLEV*), and firm- and country-level controls. In Models 2 and 3, a firm is defined as having an employee relations policy if it describes, claims to have, or mentions the processes in place to improve its labor-union relations. In Models 4 and 5, a firm is defined as having a supplier relations policy if it describes, claims to have, or mentions the processes in place to improve its partnerships with suppliers and contractors. The last row in each panel reports the *p*-value for the test of difference in the coefficients on *COL*×*HLEV* between the subsamples. Detailed variable definitions and data sources are provided in Appendix A. Consistent with common practice (Opler and Titman, 1994; Campello, 2003, 2006), we use the relative measurement method when calculating firm-level variables. Specifically, a firm's *HLEV* is measured relative to its country peers, and the other firm-level variables are constructed relative to their country-industry-year means. *t*-statistics in parentheses are based on standard errors clustered at the firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 7. Collectivism and the costs of high leverage: Legal environment

	Baseline	*Law and Order*		*Legal system and Property rights*	
		High	Low	High	Low
	(1)	(2)	(3)	(4)	(5)
$COL_c \times HLEV_{t-2}$	**0.028*** **	**0.002**	**0.024*** **	**0.019**	**0.038*** **
	(3.74)	**(0.08)**	**(2.93)**	**(1.50)**	**(3.45)**
COL_c	-0.002	-0.006	-0.009*	0.038***	-0.028***
	(-0.46)	(-0.32)	(-1.92)	(4.84)	(-4.19)
$HLEV_{t-2}$	-0.040***	-0.017	-0.040***	0.006	-0.056***
	(-4.85)	(-0.46)	(-4.63)	(0.34)	(-4.95)
Controls	Yes	Yes	Yes	Yes	Yes
CONSTANT	0.007	-0.001	0.015***	-0.019*	0.017**
	(1.42)	(-0.04)	(2.97)	(-1.80)	(2.50)
N	241,906	55,581	186,325	124,358	117,548
R^2	0.016	0.013	0.019	0.014	0.022
p-value of difference test		0.202		0.129	

This table reports OLS regression results for Equation (2) using different subsamples related to the legal environment. The dependent variable is *SALES_G*, firm sales growth, which is influenced by customers and competitors. The independent variables include a country's collectivism score (*COL*), our measure of high leverage (*HLEV*), and firm- and country-level controls. Detailed variable definitions and data sources are provided in Appendix A. Consistent with common practice (Opler and Titman, 1994; Campello, 2003, 2006), we use the relative measurement method when calculating firm-level variables. Specifically, a firm's *HLEV* is measured relative to its country peers, and the other firm-level variables are constructed relative to their country-industry-year means. Model 1 repeats the results of the baseline model using the full sample. In Models 2 and 3, a country is defined as having a strong (weak) legal system if its law and order index is greater than (less than or equal to) the median of the overall sample two years before the base year. In Models 4 and 5, a country is defined as having a good (bad) legal system and secure (insecure) property rights if the legal system and property rights index is greater than (less than or equal to) the median of the overall sample two years before the base year. The last row reports the *p*-value for the test of difference in the coefficients on *COL*×*HLEV* between the low and high subsamples. *t*-statistics in parentheses are based on standard errors clustered at the firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Appendix A Variable definitions and data sources

Variable	Definition	Source: Authors' calculations based on
Panel A. Hofstede's cultural indices		
SALES_G	Sales growth equals ($SALES_t - SALES_{t-1}$)/$SALES_{t-1}$. This variable is adjusted relative to its country-industry-year means.	Compustat
EMPLOYEE_G	Annual percentage employee (*EMP*) growth rate of equals ($EMP_t - EMP_{t-1}$)/ EMP_{t-1}, where *EMP* is the number of employees. This variable is adjusted relative to its country-industry-year means.	As above
AP_G	Annual percentage growth rate of account payable (*AP*) equals ($AP_t - AP_{t-1}$)/ AP_{t-1}. This variable is adjusted relative to its country-industry-year means.	As above
Panel B. Hofstede's cultural indices		
COL	Collectivism, equals 100 minus Hofstede's cultural index on individualism (*IDV*).	Hofstede (2001)
UAI	Hofstede's cultural index on uncertainty avoidance.	As above
MAS	Hofstede's cultural index on masculinity.	As above
PDI	Hofstede's cultural index on power distance.	As above
Panel C. High leverage variables		
HLEV	Dummy variable equal to one in a given year if the firm's leverage ratio (long term debt/total assets) is in the top three deciles in the country in which the firm is headquartered, and 0 otherwise.	Compustat
Panel D. Control variables		
SIZE	Natural logarithm of total assets expressed in U.S. dollars. This variable is adjusted relative to its country-industry-year mean.	As above
PROFIT	Profitability equals (operating earnings + depreciation)/total assets. This variable is adjusted relative to its country-industry-year mean.	As above
INVESTMENT	Investment equals capital expenditures/total assets. This variable is adjusted relative to its country-industry-year mean.	As above
SELLEXP	Sell expenses equal the sum of advertising and selling expenses/total sales. This variable is adjusted relative to its country-industry-year mean.	
DEVELOPED	Dummy variable equal to 1 if a country is classified as a developed economy, and 0 otherwise.	World Economic Situation and Prospects by United Nations
GDPG	Annual percentage growth rate of GDP per capita.	WDI
INFLATION	Annual inflation rate.	As above
LEGAL	Strength of a country's legal regime computed following the methodology of Durnev and Kim's (2005) as the product of the revised anti-director rights index (Djankov et al., 2008) and the law and order index (ICRG).	Djankov et al. (2008) and ICRG
INDUSTRY DISTRESS	Dummy set to one for industry-years with negative mean sales growth and mean stock returns below -30%, and 0 otherwise.	Compustat
LOG(SALE)	Natural logarithm of total sales expressed in U.S. dollars. This variable is adjusted relative to its country-industry-year mean.	As above
PROFITABILITY	Profitability equals operating earnings/total assets. This variable is adjusted relative to its country-industry-year mean.	As above
ASSET SALE	Asset sale equals asset sales/total assets. This variable is adjusted relative to its country-industry-year mean.	As above
Panel E. Other variables used in the baseline, subsample, endogeneity, and robustness tests		
Product Specialization	A firm is classified as having high (low) product specialization if its R&D-to-sales ratio is above (below) the sample median two years before the base year.	As above
Industry Debt Level	An industry is classified as financially unhealthy (healthy) industry if the industry average long-term debt ratio is greater than (less than or equal to) the median of the overall sample two years before the base year. The long-term debt ratio equals long term debt/total assets.	As above

STOCK MARKET DEVELOPMENT	Stock market capitalization to GDP.	World Bank's Financial Development and Structure dataset
VOICE AND ACCOUNTABILITY	Degree to which a country's citizens perceive themselves as being able to participate in selecting their government, as well as freedom of expression, freedom of association, and free media.	WGI (Kaufmann et al., 2010)
POLITICAL STABILITY	Likelihood that the government is perceived to be destabilized or overthrown by unconstitutional or violent means, e.g., politically motivated violence and terrorism.	As above
CONTROL OF CORRUPTION	Perceptions of the degree to which public power is exercised for private interests, including petty and grand forms of corruption, as well as "capture" of the state by elites.	As above
GOVERNMENT EFFECTIVENESS	Degree to which government effectiveness is perceived, including the quality of public services, the quality of the civil service, and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.	As above
ECONOMIC FREEDOM	Country's overall economic freedom score, ranging from 0 to 100, with a higher score indicating that a country is more economically free. Individuals in an economically free society would be free and entitled to work, produce, consume, and invest in any way they pleased under a rule of law, with their freedom at once both protected and respected by the state.	EFW
SIZE OF GOVERNMENT	Level of government expenditures (including consumption and transfers) as a percentage of GDP, ranging from 0 to 100, with lower values reflecting a higher level of government expenditure.	As above
GOVERNMENT INVESTMENT	Extent to which countries use private investment and enterprises rather than government investment and firms to direct resources.	As above
Labor Intensity	An industry is classified as a high (low) labor intensity industry in a given year if it has a wage-to-capital ratio greater than (less than or equal to) the median of all industries two years before the base year. Wage-to-capital ratio equals total staff expenses/net property, plant, and equipment.	Compustat
Employee Relation Policy	A firm is defined as having an employee relations policy if it describes, claims to have, or mentions the processes in place to improve its labor-union relations.	ASSET4
Supplier Relation Policy	A firm is defined as having a supplier relations policy if it describes, claims to have, or mentions the processes in place to improve its partnerships with suppliers and contractors.	As above
Law and Order	Index assessing the strength of the legal system, and the extent to which the citizens of a country are willing to rely on the established institutions to make and implement laws and adjudicate disputes. This time-varying index ranges from 0 to 6, with a higher score indicating stronger political institutions and court system, as well as popular observance of the law.	ICRG
Legal System and Property Rights	Index assessing the quality of the legal system and the security of property rights. This time-varying index has 9 subcomponents: judicial independence, impartial courts, protection of property rights, military interference in rule of law and politics, integrity of the legal system, legal enforcement of contracts, regulatory restrictions on the sale of real property, reliability of police, business costs of crime. Higher score on the index means better legal system and more secure property rights.	Fraser Institute's EFW (2012)
COL_TK	Updated collectivism, equals 100 minus Tang and Koveos' updated cultural index on individualism.	Tang and Koveos (2008)
COL_INST	GLOBE's cultural index on should-be institutional collectivism.	House et al. (2004)
FFC	Natural logarithm of the Four-Firm concentration ratio, which captures the total market share of the four largest firms in an industry.	Compustat
HHI	Natural logarithm the Herfindahl–Hirschman index, which captures the degree of market concentration in an industry.	As above

Internet Appendix for "Collectivism and the Costs of High Leverage"

Table IA1. Replicating Table 2 using Standard Errors Clustered by Country

	Baseline Model	Top 3 Deciles	Top 1 Decile
	(1)	(2)	(3)
$COL_c \times HLEV_{t-2}$		**0.028****	**0.041***
		(2.52)	**(1.80)**
COL_c		-0.002	-0.007
		(-0.11)	(-0.23)
$HLEV_{t-2}$	-0.011***	-0.040**	-0.081**
	(-6.17)	(-2.42)	(-2.45)
$SIZE_t$	0.009***	0.009***	0.017***
	(6.75)	(6.91)	(5.42)
$PROFIT_{t-1}$	0.134***	0.135***	0.104***
	(9.94)	(10.36)	(5.95)
$PROFIT_{t-2}$	-0.013	-0.013	-0.016
	(-1.32)	(-1.11)	(-1.45)
$INVESTMENT_{t-1}$	0.276***	0.276***	0.289***
	(5.53)	(5.57)	(4.49)
$INVESTMENT_{t-2}$	0.157***	0.155***	0.129***
	(5.46)	(5.59)	(3.01)
$SELLEXP_{t-1}$	0.003	0.003	0.006
	(0.59)	(0.57)	(0.96)
$SELLEXP_{t-2}$	0.022***	0.021***	0.015**
	(2.75)	(2.84)	(2.49)
$DEVELOPED_c \times HLEV_{t-2}$		0.017**	0.021
		(2.16)	(1.46)
$DEVELOPED_c$	-0.010	-0.012	-0.001
	(-1.16)	(-1.30)	(-0.05)
$GDPG_{c,t} \times HLEV_{t-2}$		0.001	0.002
		(0.83)	(1.14)
$GDPG_{c,t}$	-0.002	-0.002	-0.004
	(-0.93)	(-0.94)	(-1.43)
$INFLATION_{c,t} \times HLEV_{t-2}$		0.002***	0.005**
		(3.05)	(2.53)
$INFLATION_{c,t}$	0.001	0.000	-0.001
	(0.57)	(0.05)	(-0.32)
$LEGAL_c \times HLEV_{t-2}$		-0.000	0.000
		(-0.19)	(0.27)
$LEGAL_c$	0.000	0.000	-0.001
	(0.14)	(0.19)	(-0.84)
CONSTANT	0.004	0.007	0.042
	(0.23)	(0.39)	(1.41)
N	241,906	241,906	73,205
R^2	0.015	0.016	0.017

This table reports OLS regression results for Equations (1) and (2). The dependent variable is *SALES_G*, firm sales growth, which is influenced by customers and competitors. The independent variables include the proxy for collectivism (*COL*), high leverage (*HLEV*), and firm- and country-level controls. Detailed descriptions of variable definitions and data sources are provided in

Appendix A. Consistent with common practice (Opler and Titman, 1994; Campello, 2003, 2006), we use the relative measurement method when calculating firm-level variables. Specifically, a firm's *HLEV* is measured relative to its country peers, and the other firm-level variables are constructed relative to their country-industry-year means. Model 1 presents results for Equation (1) on the costs of high leverage. Model 2 presents results for Equation (2) on the effect of collectivism on the costs of high leverage. Model 3 repeats Model 2 using a more extreme definition of high leverage that assigns a value of one to the top decile firm-year observations and a value of zero to the bottom decile observations. Comparisons based on this definition are between extremely high-leveraged firms and extremely low-leveraged firms. *t*-statistics in parentheses are based on standard errors clustered at the country level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table IA2. Replicating Table 2 using Standard Errors Clustered by Country and Year

	Baseline Model	Top 3 Deciles	Top 1 Decile
	(1)	(2)	(3)
$COL_c \times HLEV_{t-2}$		**0.028*** **	**0.041***
		(3.18)	**(1.83)**
COL_c		-0.002	-0.007
		(-0.16)	(-0.29)
$HLEV_{t-2}$	-0.011***	-0.040***	-0.081***
	(-6.78)	(-3.47)	(-3.39)
$SIZE_t$	0.009***	0.009***	0.017***
	(13.67)	(13.96)	(11.61)
$PROFIT_{t-1}$	0.134***	0.135***	0.104***
	(13.61)	(13.52)	(8.15)
$PROFIT_{t-2}$	-0.013	-0.013	-0.016
	(-1.42)	(-1.42)	(-1.34)
$INVESTMENT_{t-1}$	0.276***	0.276***	0.289***
	(11.47)	(11.50)	(7.02)
$INVESTMENT_{t-2}$	0.157***	0.155***	0.129***
	(7.94)	(7.86)	(4.08)
$SELLEXP_{t-1}$	0.003	0.003	0.006
	(0.76)	(0.74)	(1.31)
$SELLEXP_{t-2}$	0.022***	0.021***	0.015**
	(4.16)	(4.13)	(2.46)
$DEVELOPED_c \times HLEV_{t-2}$		0.017***	0.021
		(2.84)	(1.58)
$DEVELOPED_c$	-0.010	-0.012*	-0.001
	(-1.31)	(-1.94)	(-0.07)
$GDPG_{c,t} \times HLEV_{t-2}$		0.001	0.002
		(0.88)	(1.12)
$GDPG_{c,t}$	-0.002	-0.002	-0.004
	(-0.97)	(-1.02)	(-1.44)
$INFLATION_{c,t} \times HLEV_{t-2}$		0.002***	0.005***
		(3.57)	(3.86)
$INFLATION_{c,t}$	0.001	0.000	-0.001
	(0.51)	(0.05)	(-0.33)
$LEGAL_c \times HLEV_{t-2}$		-0.000	0.000
		(-0.22)	(0.29)
$LEGAL_c$	0.000	0.000	-0.001
	(0.18)	(0.24)	(-0.98)
CONSTANT	0.004	0.007	0.042**
	(0.24)	(0.61)	(2.38)
N	241,906	241,906	73,205
R^2	0.015	0.016	0.017

This table reports OLS regression results for Equations (1) and (2). The dependent variable is *SALES_G*, firm sales growth, which is influenced by customers and competitors. The independent variables include the proxy for collectivism (*COL*), high leverage (*HLEV*), and firm- and country-level controls. Detailed descriptions of variable definitions and data sources are provided in Appendix A. Consistent with common practice (Opler and Titman, 1994; Campello, 2003, 2006), we use the relative measurement method when calculating firm-level variables. Specifically, a firm's *HLEV* is measured relative to its country peers, and the other firm-level variables are constructed relative to their country-industry-year means. Model 1 presents results for Equation (1) on the costs of high leverage. Model 2 presents results for Equation (2) on the effect of collectivism on the costs of high leverage. Model

3 repeats Model 2 using a more extreme definition of high leverage that assigns a value of one to the top decile firm-year observations and a value of zero to the bottom decile observations. Comparisons based on this definition are between extremely high-leveraged firms and extremely low-leveraged firms. *t*-statistics in parentheses are based on standard errors clustered by country and year. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table IA3. Collectivism and the costs of high leverage: Firm fixed effect and propensity score matching

	Firm Fixed Effect (without de-meaning)	Firm Fixed Effect (without de-meaning)	Propensity Score Matching
	(1)	(2)	(3)
$\boldsymbol{COL_c \times HLEV_{t-2}}$	**0.048*** **	**0.045*** **	**0.029*** **
	(4.33)	**(4.08)**	**(3.32)**
COL_c			-0.003
			(-0.45)
$HLEV_{t-2}$	-0.065***	-0.063***	-0.036***
	(-5.96)	(-5.57)	(-3.72)
$SIZE_t$	0.027***	0.028***	0.007***
	(16.27)	(16.44)	(12.64)
$PROFIT_{t-1}$	0.079***	0.079***	0.144***
	(8.00)	(7.90)	(12.65)
$PROFIT_{t-2}$	-0.022**	-0.024**	-0.030***
	(-2.35)	(-2.50)	(-2.92)
$INVESTMENT_{t-1}$	0.195***	0.176***	0.276***
	(10.01)	(8.57)	(12.38)
$INVESTMENT_{t-2}$	0.127***	0.120***	0.192***
	(7.19)	(6.43)	(10.00)
$SELLEXP_{t-1}$	0.056***	0.056***	-0.007
	(10.34)	(10.27)	(-1.17)
$SELLEXP_{t-2}$	0.025***	0.025***	0.025***
	(4.83)	(4.65)	(4.10)
$DEVELOPED_c \times HLEV_{t-2}$	0.030***	0.029***	0.021***
	(4.22)	(3.99)	(3.49)
$DEVELOPED_c$			-0.015***
			(-3.41)
$GDPG_{c,t} \times HLEV_{t-2}$	0.001*	0.001**	-0.000
	(1.67)	(2.00)	(-0.37)
$GDPG_{c,t}$	-0.002***	-0.002***	-0.001*
	(-3.77)	(-3.79)	(-1.93)
$INFLATION_{c,t} \times HLEV_{t-2}$	0.002***	0.002***	0.002***
	(3.92)	(2.92)	(2.75)
$INFLATION_{c,t}$	0.001***	0.001***	0.000
	(3.39)	(3.39)	(1.22)
$LEGAL_c \times HLEV_{t-2}$	0.000	0.000	-0.000
	(1.06)	(1.28)	(-0.39)
$LEGAL_c$	0.006***	0.006***	0.000
	(9.49)	(9.55)	(0.61)
CONSTANT	-0.296***	-0.303***	0.004
	(-18.52)	(-18.63)	(0.58)
N	241,906	224,156	141,068
R^2	0.011	0.011	0.016

This table reports results from estimating firm fixed effect models and using propensity score matching. The dependent variable is *SALES_G*, firm sales growth, which is influenced by customers and competitors. The independent variables include the proxy for collectivism (*COL*), high leverage (*HLEV*), and firm- and country-level controls. Detailed descriptions of variable definitions and data sources are provided in Appendix A. Consistent with common practice (Opler and Titman, 1994; Campello, 2003, 2006), we use the relative measurement method when calculating firm-level variables. Specifically, a firm's *HLEV* is measured relative to its country peers. Models 1 and 2 report the firm fixed effect results. We keep all variables unadjusted (without de-meaning). Model

1 includes all firm observations. Model 2 includes only firms that have experienced changes in high leverage status over the sample period. Model 3 reports propensity score matching results. In Model 3, firm-level variables are constructed relative to their country-industry-year means. *t*-statistics in parentheses are based on standard errors clustered at the firm level. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively.

Table IA4. Robustness check: sample composition and alternative measures

	$COL_c \times HLEV_{t-2}$	COL_c
	(1)	(2)
Panel A. Sample Composition		
(1) Exclude U.S.	**0.046*** **	-0.042***
	(4.10)	(-6.09)
(2) Exclude Japan	**0.026** **	-0.004
	(2.25)	(-0.62)
(3) Exclude Japan & U.S.	**0.049*** **	-0.061***
	(3.22)	(-6.52)
(4) Weighted Regression	**0.035*** **	0.004
	(4.02)	(0.70)
Panel B. Alternative Proxy for High Leverage		
(5) Lag Three Years	**0.013** **	0.018***
	(2.13)	(3.12)
Panel C. Alternative Proxies for Collectivism		
(6) *COL_TK* (Updated Hofstede by Tang and Koveos, 2008)	**0.016** **	0.045***
	(2.17)	(5.55)
(7) *COL_INST* (Globe)	**0.007***	0.000
	(1.77)	(0.10)

This table reports results from a series of robustness tests. Only coefficients of *COL×HLEV* and *COL* are reported for brevity. In Panel A, we re-estimate our baseline regressions (Equation (2)) after excluding U.S. firms (Row 1), Japanese firms (Row 2), and firms from both countries (Row 3). In addition, we run a weighted regression in which each country is assigned a weight equal to the reciprocal of its number of observations (Row 4). In Panel B, the robustness test employs an alternative proxy for high leverage. In Panel C, the robustness tests employ alternative proxies for collectivism. *t*-statistics in parentheses are based on standard errors clustered at the firm level. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively.

Table IA5. Robustness check: firm exit bias

Mean Rate of Firm Exit	Bankruptcy	Merger	Others	**All**
	(1)	(2)	(3)	**(4)**
Panel A. Split by High Leverage				
[1] Yes	0.33%	2.97%	2.11%	**5.41%**
[2] No	0.22%	2.93%	1.71%	**4.86%**
Panel B. Split by Collectivism				
[3] High	0.08%	1.27%	1.00%	**2.35%**
[4] Low	0.56%	6.00%	3.34%	**9.90%**
[1]-[2] *p*-value of difference between High and Low Leverage Sample	0.000***	0.159	0.000***	**0.000*** **
[3]-[4] *p*-value of difference between High and Low Collectivism	0.000***	0.000***	0.000***	**0.000*** **

This table reports the mean rate of firm exit due to reasons documented in Compustat Global data item DLRSN (Reason for deletion). Mean rate of Bankruptcy is the proportion of firm-year observations that exit Compustat because of bankruptcy or liquidation (DLRSN=02 or 03). Mean rate of Merger is the proportion of firm-year observations that exit Compustat because of acquisition or merger (DLRSN=01). Mean rate of Others is the proportion of firm-year observations that exit Compustat for reasons other than bankruptcy or merger (DLRSN=04-07, 09 or 10). Mean rate of All is the proportion of firm-year observations that exit Compustat for reasons listed in Models 1 to 3 (DLRSN=01-07, 09 or 10). Panel A presents the mean rate of firm exit split by high leverage. A firm is assigned to the high (low) leverage subsample if *HLEV*=1 (0) two years before the base year. Panel B presents the mean rate of firm exit split by high and low collectivism samples. Countries with high (low) collectivism have a collectivism score above (below or equal to) the median of the overall sample. ***, **, and * indicate statistical significance at the 1, 5, and 10% levels, respectively.

Table IA6. Collectivism and the costs of high leverage: Market structure explanation

	(1)	(2)
COL×HLEV$_{t-2}$	**0.028*** **	**0.029*** **
	(3.75)	**(3.78)**
COL	-0.003	-0.002
	(-0.58)	(-0.45)
FFC$_{t-2}$×HLEV$_{t-2}$	**-0.003**	
	(-0.49)	
FFC$_{t-2}$	0.009**	
	(2.48)	
HHI$_{t-2}$×HLEV$_{t-2}$		**-0.006**
		(-0.63)
HHI$_{t-2}$		-0.002
		(-0.36)
HLEV$_{t-2}$	-0.039***	-0.039***
	(-4.42)	(-4.69)
Controls	Yes	Yes
N	241,906	241,906
R^2	0.016	0.016

This table reports OLS regression results for Equation (2) and further controls for market structure variables and their interactions with *HLEV*. The dependent variable is *SALES_G*, firm sales growth, which is influenced by customers and competitors. The independent variables include the proxy for collectivism (*COL*), high leverage (*HLEV*), and firm- and country-level controls. *FFC* is the natural logarithm of the Four-Firm concentration ratio, which is the total market share of the four largest firms in an industry. *HHI* is the natural logarithm of the Herfindahl–Hirschman index, which captures the degree of market concentration in an industry. Detailed descriptions of variable definitions and data sources are provided in Appendix A. Consistent with common practice (Opler and Titman, 1994; Campello, 2003, 2006), we use the relative measurement method when calculating firm-level variables. Specifically, a firm's *HLEV* is measured relative to its country peers, and the other firm-level variables are constructed relative to their country-industry-year means. Model 1 additionally controls for *FFC* and its interaction with *HLEV*. Model 2 additionally controls for *HHI* and its interaction with *HLEV*. *t*-statistics in parentheses are based on standard errors clustered at the firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.