Global leverage adjustments, uncertainty, and country institutional strength

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Global Leverage Adjustments, Uncertainty, and Country Institutional Strength*

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January 22, 2018

Abstract

Using a broad range of uncertainty measures, we show that uncertainty dramatically slows down firms' adjustments toward their optimal capital structure. At the upper bound, the estimated speed of leverage adjustments almost halves when uncertainty is high. High quality institutions (common law legal origin, more disclosure to congress and/or to the public, and higher public sector ethics) and presidential political systems offset some of the adverse effects of uncertainty on leverage adjustments. The financial crisis has altered the relationships among uncertainty, adjustment speeds, and a country's institutions; more so for countries with weak institutions and parliamentary systems.

JEL classification: G30; G32; G35

Keywords: Institutions; International; Leverage; Uncertainty; Speed of Adjustment; Financial Crisis

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1. Introduction

Uncertainty is a condition in which one cannot ascertain the probability of an event and cannot insure against it occurring (North, 1991). It is therefore a ubiquitous concern to business executives and policymakers and dramatically increases with political and economic shocks (Bloom, 2009). Increasing uncertainty can depress economic activities if agents are subject to fixed costs or irreversibility, if they are risk averse, or if financial constraints tighten in response to higher uncertainty. A challenge in empirically assessing the economic impact of uncertainty is that no objective measure of uncertainty exists (Jurado, Ludvigson, and Ng, 2015). This paper relies on political events and various economic policy debates as major sources of uncertainty and analyzes the impact of such policy-induced uncertainty on financial market frictions and firm financing.¹

Approaching elections or various internal debates can increase political and economic uncertainty. Elevated uncertainty can, in turn, be harmful to a country's economic actors. A plethora of anecdotal examples can be cited from around the world on the adverse effects of uncertainty on firms' investment and financing decisions. For instance, U.S. news articles on the government shutdown and the debt-ceiling crisis in December 2013 argued that they "produced a noticeable and fearful effect among Corporate America"; with "unintended consequences", including "trillions disappearing from capital markets." Similarly, a March 2014 *Wall Street Journal* article points to the "high cost of policy uncertainty" in India and argues that the "next government needs to reduce the policy uncertainty that companies face" in order to "encourage companies to announce fresh projects," "depending on the state of corporate finances."

A widely accepted view in the capital structure literature is that when firms issue debt or equity, they take their target leverage into consideration (Graham and Harvey, 2001). Due to market frictions, such as issuance costs, financial intermediation costs, or uncertainty, firms may choose to temporarily deviate from their target leverage. To the extent that rebalancing is costly, adjustment to target leverage is slower

¹ Throughout the paper, we use the term "uncertainty" to refer to economy-wide uncertainties associated with (1) elections that determine a country's national leaders and other veto players; (2) current national governments that are constituted of coalitions with dispersed power centers, which may render it difficult to formulate and implement necessary policies; and (3) public debates and discussions about the economic policies within a nation as reflected in that country's news media.

(Hovakimian, Opler, and Titman, 2001; Flannery and Rangan, 2006; Lemmon, Roberts, and Zender, 2008). Since unpredictable political and economic outcomes in a country may create uncertainty that disrupts firms' regularly planned activities, in this paper, we posit that uncertainty exacerbates financial frictions and that firms exposed to uncertainty should exhibit slower leverage adjustment speeds.

We use a broad range of uncertainty measures and conduct diverse sets of cross-country tests. Some of our uncertainty measures capture the election-driven uncertainty prevalent before national elections (Boutchkova et al., 2012; Julio and Yook, 2012) and other key elections that change the veto players in the country (e.g., the control of the legislature changes hands). Our non-election-based uncertainty measures capture how concentrated the current government's power is and whether the media coverage of economic policy uncertainty is fervent (the *Economic Policy Uncertainty Index*, *EPUI* of Baker, Bloom, and Davis, 2016, and its sub-components). We find that the variation in uncertainty affects financial intermediation costs, which in turn influence adjustment patterns. The median gross equity and debt underwriter spread in our sample are around 5.2% and 2.8%, respectively. When uncertainty is high, the underwriters increase their gross equity and debt spreads by 106–296 and 21–48 basis points (a relative change of 16%–45% and 8%–18%), respectively, depending upon the uncertainty measure used. Consequently, uncertainty lowers the odds of debt and equity issuances by about nine percentage points, compared to unconditional frequencies for debt and equity issues on average of 45% and 32%, respectively. Thus, our financial intermediation costs channel can explain how uncertainty leads to a decline in issuances and the associated slow-down in the speed of adjustment. However, the role of this channel is less clear in the case of debt and equity repurchases, which have different cost structures than issuances.

Our estimation results also show a significantly negative impact of uncertainty on adjustment speeds. A standard deviation increase of one in uncertainty results in a 2% to 8% decrease in the speed of adjustment (compared with an average adjustment speed of 19%), depending upon the adjustment cost and the uncertainty measure. While an average firm takes approximately three years to close half the gap between actual and optimal capital structure, this duration goes up to five years with higher uncertainty, using the news-based *Economic Policy Uncertainty Index* of Baker et al. (2016). The analysis of the sub-

components of this index highlights fiscal, regulatory, and government policies as relatively more powerful sources of uncertainty. After extracting the portion of adjustment costs that can only be explained by uncertainty, we show that financial intermediation costs channel is a key driver of the relationship between uncertainty and adjustment speed. When we allow for a nonlinear relationship between uncertainty and the speed of adjustment, we find that high uncertainty slows adjustment by 13%, while low uncertainty does not affect the speed of adjustment to an economically meaningful extent. In other words, while high uncertainty increases financial intermediation costs, low uncertainty does not substantially reduce these costs. Downward changes in uncertainty speed up adjustment by a factor of nearly two at the highest uncertainty level compared to the lowest uncertainty level (11.9% vs. 6.5%). For the upward changes in uncertainty, the speed of adjustment is only affected at the highest uncertainty level (a decline of 15.7%). A country's institutions can be designed to mitigate the disruptive effects of uncertainty. Firms in presidential political systems and in countries with strong legal and political institutions are able to counteract some of the adverse effects of uncertainty on capital structure adjustments (by a magnitude ranging from 2% to 6%) and alleviate the disruptive effects of the recent financial crisis (e.g., Campello, Graham, and Harvey, 2010; Duchin, Ozbas, and Sensoy, 2010). The recent financial crisis has significantly altered the relationships among uncertainty, adjustment speeds, and a country's institutions—and does so even more for countries with weak institutions and parliamentary systems.

Some studies question the information contained in the estimates of the speed of adjustment that use a partial adjustment model (e.g., Shyam-Sunder and Myers, 1999; Chen and Zhao, 2007; Chang and Dasgupta, 2009; Graham and Leary, 2011; Hovakimian and Li, 2011, 2012; Iliev and Welch, 2015). This study does not focus on the absolute level of the speed of adjustment, which is the major concern of the aforementioned studies. Rather, it exploits the heterogeneity in the estimated adjustment speeds over time and across countries. Our empirical models are saturated with country fixed effects for the proper identification of the economic channel and allow uncertainty and institutional strength to affect leverage targets. Our results are robust to alternative measures of adjustment costs, uncertainty, and control variables; model specifications; testing strategies; and subsample analyses.

2. Hypotheses Development

We develop three hypotheses related to leverage adjustments.² First, our *adjustment cost (financial intermediation cost) hypothesis* posits that gross spreads demanded by underwriting firms increase with uncertainty because (1) information asymmetry between firms and outside investors increases (Durnev, 2011; Gungoraydinoglu, Colak, and Oztekin, 2017), (2) investors require higher risk premiums for financial assets (Pastor and Veronesi, 2012; 2013), and (3) the markets are more volatile (Bialkowski, Gottschalk, and Wisniewski, 2008; Boutchkova et al., 2012). This adds to the placement costs incurred by intermediary firms and increases their failure (or reputational) risks (Altinkilic and Hansen, 2000). Second, our *capital structure adjustment hypothesis* posits that greater uncertainty leads to lower frequency and volume of capital structure adjustments due to the higher costs of transacting in financial markets and/or increases in investor and firm uncertainties. This results in slower adjustment toward target leverage (Leary and Roberts, 2005; Strebulaev, 2007). Our first two hypotheses argue that uncertainty delays capital structure adjustments through the financial intermediation channel and forces firms to operate with suboptimal levels of leverage for a longer period of time. In our third hypothesis, we suggest a remedy for such suboptimal outcomes. Our *institutional strength hypothesis* claims that certain institutions can ameliorate the adverse effects of uncertainty on the adjustment speed. Countries cannot totally avoid uncertainty, but institutions can be introduced or redesigned to counteract some of its detrimental effects (North, 1991).

3. Data, Sample Selection, and Variables

This section describes our sample selection criteria, the variables utilized in the empirical analysis, and the data sources we use to obtain various firm and country characteristics.

3.1. Country Characteristics and Uncertainty Data

We retrieve information on firms' institutional environments from various sources, primarily the law and finance literature. The macroeconomic data is from the World Development Indicators (WDI) database. For elections, we rely primarily on the Database of Political Institutions (DPI) developed by the

² Please see Online Appendix, Section A for a detailed review of the existing literature.

World Bank's Development Research Group. We verify this data with the Election Results Archive (ERA) of the Center on Democratic Performance (CDP), the Polity IV Project dataset of the Center for Systemic Peace, and the PARLINE database. Each election is described by the following variables: the election date, the type of political system present at the time of the election (presidential or parliamentary), the proportion of votes received by the winner and the runner-up candidates/parties, and the percentage of seats held by the governing party during a given calendar year. National elections are those where the nation's most powerful politician(s) get elected (Julio and Yook, 2012). In parliamentary (presidential) systems, the national elections are those where the parliament/congress (the president) gets elected. We also identify elections that result in a turnover of one of the political system's "veto players." Veto players are the actors—politicians or political parties—who can block proposals that disrupt the status quo.³

Some of our uncertainty indicators, *Election Dummy*, *Shifted Election Dummy (SED)*, and *Change Veto Players, (CVP)* capture the uncertainty of the economic agents about an election's outcome. *Election Dummy* shows whether there was an election during that calendar year. The *SED* measure is similarly designed, except when the election is in the first half of the year, in which case the previous calendar year is considered to have high political uncertainty. *CVP*, a measure relatively new to the literature, tabulates the percent of veto players who drop from the government in any given year. It captures uncertainty generated by any election that causes a substantial shift in a country's veto players. We also have several non-election-based measures that capture sources of uncertainty not directly associated with elections: *Coalition*, *EPUI*, *Monetary Policy*, *Fiscal Policy*, *Regulatory Policy*, *Government Policy*, and *International Economics Policy*. Examples of non-election-based events include the 2013 U.S. government shut-down and the 2013 Italian government vote of confidence. These variables capture the residual uncertainty that remains after elections are over. In many countries (e.g., Brazil, India, Israel, and many European countries) coalition governments are more common than single party governments. If the outcome of an election is a coalition government with dispersed power centers, this outcome (*Coalition*) would not eliminate all of the

³ Veto players are the president and the largest party in the legislature for a presidential system, and the prime minister and the parties in the majority government coalition for a parliamentary system. See Table 1 for further details.

uncertainty that was prevalent prior to the election. Economic agents would still be unsure which of the promised policies will be implemented. The remaining non-election-based uncertainty measures, namely the *Economic Policy Uncertainty Index*, *EPUI* and its subcomponents, use newspaper references to economic policy uncertainty. They have the advantage of being continuous and of capturing the day-to-day policy debates prevalent in a country during a given period. The category-specific economic policy uncertainty measures (i.e., subcomponents of *EPUI*) capture a broad range of impact channels.⁴

Election indicators have the advantage of being exogenous measures of uncertainty, since elections are typically pre-scheduled events (Durnev, 2011; Julio and Yook, 2012; Boutchkova et al., 2012). But elections also have the disadvantage of assuming that uncertainty is high for the entire year of the election. Since our accounting data is in yearly frequency, using annual uncertainty measures is appropriate for this study. We use two approaches to address the election timing issue. First, we use two alternative election dummies: *Election Dummy* and the 6-month shifted version of this dummy (*SED*). Second, we use continuous measures of uncertainty, namely the Baker et al. (2016)'s *Economic Policy Uncertainty Index* (*EPUI*) and its sub-indices. With these indices, timing issues are eliminated, but then uncertainty measures may become endogenous to the changes in the accounting variables. Furthermore, this index is unavailable for some countries.⁵ Due to such tradeoffs, we also conduct placebo tests which provide evidence that the results are not driven by changes in unobserved or omitted variables around the time of the elections.

3.2. Firm-level data

We obtain firm-level data from several sources during our sample period between 1990 and 2012.⁶ The firm accounting data for each country is retrieved from Compustat Global Vantage. We drop firms

⁴ *Monetary Policy*, *Fiscal Policy*, and *Regulatory Policy* uncertainty indices are the same as in Baker et al. (2016). In creating *Government Policy* and *International Economics Policy* uncertainty indices, we use the first principal component of the related measures in each category. This accomplishes an extraction of their common driver to form a broader policy-relevant category. *Government Policy* index involves uncertainty related to governmental obligations and events (i.e., *EPUI*'s subcomponents related to "Healthcare," "Entitlement Programs," "Debt Ceiling," "Government Shutdown"). *International Economics Policy* entails uncertainty generated by "Trade Policy," "Sovereign Debt and Currency Crisis," and "National Security."

⁵ Country (starting year): Australia (1998), Brazil (1991), Canada (1990), France (1990), Germany (1993), Japan (1990), India (2003), Ireland (1990), Italy (1997), South Korea (1990), Spain (2001), Sweden (1990), United Kingdom (1997), United States (1990).

⁶ Due to lack of reliable election data prior to the 1989 Berlin Wall collapse, we start the sample in 1990. *Coalition and Change Veto Players* are obtained from DPI data and this data was last updated by the World Bank in 2012.

from countries where national elections are non-existent or countries that are ruled by a strong monarchy (e.g., Kuwait and Saudi Arabia), countries with a one-party system (e.g., China and Hong Kong), or countries that are run by a ruler with “dictator-like powers” (e.g., Egypt and Venezuela). To reduce short panel bias, we eliminate firms that do not have data for at least five consecutive years. Following the previous literature, we delete financial firms (SICs 6000-6999) and utilities (SICs 4000-4999). We also drop countries that have fewer than ten firms with available accounting data (this ensures reasonable cross-sectional variation within a country). To measure adjustment costs, we obtain information on all domestic and global SEOs and straight bond offerings conducted in our sample countries during the sample period from the Security Data Corporation (SDC)'s Global New Issues Database.⁷ We exclude private placements, unit offerings, rights offerings, shelf offerings, and offerings by financial and utility companies.

We end up with an unbalanced panel comprised of 16,519 firms from 38 countries. Our election sample is comparable to the one in other studies. In our sample, there is one election per country every 3.85 years (mean *Election Dummy* is approximately 0.26 elections per year) and Julio and Yook (2012) report a similar average (one election every 3.80 years). To eliminate the effect of outliers, all of the continuous variables are winsorized at the 1% and 99% levels. Table 1 shows the definition, data source, construction, and summary statistics of the firm- and country-level variables used in this study.

4. Empirical Methodology

This paper assesses how the interaction of uncertainty and financial market distortions affects capital structure dynamics. If the future is uncertain, it would be expensive to tap debt or equity funding and firms would be slower to adjust their capital structure. There are capital structure models that show that deviations from target leverage make a difference in leverage changes. We model each firm's target leverage as a function of observed firm characteristics, $X_{ij,t-1}$ (Hovakimian et al., 2001; Flannery and Rangan, 2006; Huang and Ritter 2009; Frank and Goyal, 2009; De Jonghe and Öztekin, 2015; and Öztekin,

⁷ It is not clear, a priori, whether financial intermediation costs for bank debt would be affected by uncertainty the same way as public bond issues. For this reason, and due to data limitations, our tests focus on public issues only, rather than bank loans. Further details on the relationship between political uncertainty and bank debt are provided by Francis, Hasan, and Zhu, 2014.

2015). These determinants are profitability, depreciation expenses, tangibility, firm size, market-to-book ratio, research and development (R&D) expenses, R&D dummy, and the median leverage ratio:

$$TL_{ij,t} = \beta X_{ij,t-1}. \quad (1)$$

Depending on the costs and benefits of rebalancing their capital structure, firms assess how quickly to close any gap between their actual ($L_{ij,t-1}$) and their target leverage ($TL_{ij,t}$):

$$L_{ij,t} - L_{ij,t-1} = \lambda_j (TL_{ij,t} - L_{ij,t-1}) + \varepsilon_{ij,t}. \quad (2)$$

Substituting Equation (1) into Equation (2) and re-arranging yields:

$$L_{ij,t} = (\lambda\beta)X_{ij,t-1} + (1 - \lambda)L_{ij,t-1} + \varepsilon_{ij,t} \quad (3)$$

The adjustment speed (λ) allows firm i in country j to move only part of the way towards its target leverage during year t . If managers have target debt ratios and make proactive efforts to reach them, λ should be greater than zero. In other words, firms should make adjustments when there is a wedge between the target and the actual leverage (hereinafter called “the distance” and estimated as $\widehat{DIS}_{ij,t-1} = \widehat{TL}_{ij,t} - L_{ij,t-1}$). In the presence of market frictions, the adjustment is not instantaneous and λ is less than one. While the adjustment speed (λ) in Equation (3) is constant, to test our hypotheses, we allow uncertainty (and financial intermediation costs) to reduce the firm’s rate of adjustment towards its target leverage. Thus, λ varies with uncertainty indicators, UI (financial intermediation costs, FIC), and controls:

$$\lambda_{ij,t} = \Lambda_{ij,t-1}^{UI(FIC)} UI(FIC)_{j,t-1} + \Lambda_{j,t-1}^C H_{j,t-1}. \quad (4)$$

where $\Lambda^{UI,FIC,C}$ are coefficient vectors and $H_{j,t-1}$ is a set of covariates that could affect the adjustment speed (a constant, GDP growth, bond and stock market capitalization, country fixed effects).⁸

Substituting Equation (4) in Equation (3) and re-arranging yields the equation for a partial adjustment model with heterogeneity in the speed of adjustment:

$$\Delta L_{ij,t} = [\Lambda_{ij,t-1}^{UI(FIC)} UI(FIC)_{j,t-1} + \Lambda_{j,t-1}^C H_{j,t-1}] (\beta_j X_{ij,t-1} - L_{ij,t-1}) + \delta_{ij,t}. \quad (5)$$

⁸ Our results are robust to the inclusion of additional time-varying country-level and macroeconomic controls along with country and year fixed effects (see Online Appendix, Section B2).

To estimate Equation (5), we use a two-step process. In the first step, we estimate Equation (3) country by country, with the inclusion of firm and year fixed effects using system GMM⁹ (Blundell and Bond, 1998) and obtain an estimate of target leverage using Equation (1). Using the results from the first step, we calculate each firm's distance from its (estimated) target leverage, $\widehat{DIS_{ij,t-1}}$, and substitute this estimated distance in Equation (3) to obtain the following:

$$\Delta L_{ij,t} = [\Lambda_{ij,t-1}^{UI(FIC)} UI(FIC)_{j,t-1} + \Lambda_{j,t-1}^C H_{j,t-1}] (\widehat{DIS_{ij,t-1}}) + \delta_{ij,t}. \quad (6)$$

Equation (6) involves a pooled OLS regression of leverage changes on the product of $\widehat{DIS_{ij,t-1}}$ and the covariates affecting the adjustment speed (e.g., uncertainty indicators or financial intermediation costs) with bootstrapped standard errors to account for the generated regressor (Pagan, 1984; Faulkender et al., 2012). To ease economic interpretation, all continuous variables are standardized.

We recognize that partial adjustment models have their limitations (e.g., Graham and Leary, 2011). According to some studies, the rate of conversion to target is not high enough to be considered a first-order policy determinant.¹⁰ Also, in a partial adjustment model, each period's capital structure choice is driven by comparison of observed leverage to target leverage. Yet, optimal policy should take into account initial leverage and recapitalization boundaries, as well as the effects of financing decisions on future investment and financing. We exploit heterogeneity in the adjustment speeds over time and across countries, rather than focusing on the absolute level of the speed of adjustment, which is the major concern implied in the aforementioned studies. To further alleviate these concerns, we look for evidence in leverage targeting outside of the partial adjustment framework, namely the security issuance choices.

⁹ According to Flannery and Hankins (2013), this is the best estimator in the presence of an endogenous transformed lagged-dependent variable and a short panel, as is the case in our sample.

¹⁰ See Fama and French (2002); Baker and Wurgler (2002); Welch (2004); Iliev and Welch (2015), among others. This line of research questions whether firms actively manage leverage toward a target. Alternative explanations put forth are mismeasurement of adjustment speeds (bias in estimates of partial-adjustment coefficients or misspecification of the dynamic process due to boundedness of leverage) and low power of the partial adjustment model (mechanical mean reversion, e.g., Shyam-Sunder and Myers, 1999; Chang and Dasgupta, 2009). Since there is no reason to believe that the bias of the partial adjustment models would vary with economic conditions (high vs. low uncertainty), analyzing the cross-sectional and time-series variation in the speed of adjustments and deriving qualitative conclusions from such analyses should be a valuable scholarly investigation.

5. Uncertainty and the Speed of Adjustment towards the Target Capital Structure

An uncertain environment could hinder a firm's adjustment to its target capital structure by affecting the costs of adjustment and making the issuances of debt and equity securities more expensive and less likely. In this section, we analyze how firms' capital structure adjustments and adjustment speeds are affected by elevated financial intermediation costs under uncertainty.

5.1. *Uncertainty and Financial Intermediation Costs*

We begin our analyses by determining whether and how major components of adjustment costs are affected by uncertainty. We use the gross fees paid by issuing firms to financial intermediaries. Then, using one of our uncertainty indicators, we group our financial intermediation cost measures into issuances during high vs. low uncertainty periods. Using *Election Dummy*, *Shifted Election Dummy*, and *Coalition* measures, the grouping is based on whether the indicator variable is zero (Low Uncertainty) or one (High Uncertainty). For *Change Veto Players* and *Economic Policy Uncertainty Index*, the grouping is relative to these variables' median values with above (below) median denoting High (Low) Uncertainty states. The effects of uncertainty on debt and equity intermediation costs are summarized in Table 2.

The median equity (debt) gross underwriter spread in the SEO (bond) sample (Table 2) is around 5.2% (2.8%). When uncertainty is high, the underwriters increase the gross equity (debt) spread by 106–296 (21–48) basis points (bps) in absolute terms and 16%–45% (8%–18%) in relative terms, depending upon the uncertainty measure used. Our finding that equity adjustment costs are affected more severely by uncertainty compared to debt adjustment costs is new. Prior studies have not been able to document this result because they have focused primarily on either equity or debt issues (but not both). Furthermore, the use of different uncertainty measures, methods, and samples across diverse studies has prevented meaningful comparisons between the costs of debt and equity offerings. In short, uncertainty increases the risks and the placement costs for financial intermediaries who, in turn, pass along these costs to the issuing firms in the form of higher financial intermediation costs for both debt and equity securities. However, the increase in financial intermediation costs is more significant for equity than for debt, which is consistent with the economic intuition that equity contracts are relatively more sensitive to uncertainty-related costs

than debt contracts. Our results are robust to using alternative measures of financial intermediation costs (Online Appendix, Section B1).

Insert Table 2 about here.

With the exception of *Coalition* results for debt contracts (due to the low number of observations in high uncertainty states with this proxy), the results confirm that uncertainty amplifies financial frictions in the marketplace. The evidence presented so far thus lends strong support to our first hypothesis, in that uncertainty increases the financial intermediation costs associated with the issuance of new securities. In the following two subsections, we examine the consequences of elevated financial intermediation (adjustment) costs for firms' adjustment patterns and adjustment speeds.

5.2. *Uncertainty and Capital Structure Adjustment Patterns*

Higher costs associated with the issuance of new debt and equity securities under elevated uncertainty should alter the frequency and the size of a firm's capital market access. Capital market access is defined as a debt issuance/retirement or an equity issuance that is larger in size than 5% of the firm's lagged total assets. The threshold value for access through equity repurchases is 1.25% (instead of 5%) of the prior year assets (as in Leary and Roberts, 2005).

Insert Table 3 and Table 4 about here.

Table 3 reports the percentage of firm years in which our sample firms access external capital markets (Panel A), the volume of the capital structure adjustments (Panel B), how that access breaks down between debt and equity securities and during periods of low and high uncertainty. Uncertainty is measured by *Shifted Election Dummy (SED)*, in which non-election years indicate low uncertainty periods and election years indicate high uncertainty periods. We also distinguish between external and internal capital structure management. External management is the outcome of the net issuances of debt and equity securities. Internal management denotes internally funded changes in retained earnings.

Consistent with Oztekin and Flannery (2012), all forms of external financing activities are relevant for capital structure rebalancing in our international sample of firms. Also, in line with the findings of Hovakimian (2004) and Leary and Roberts (2005) for U.S. firms, debt transactions are more important for

the leverage adjustment process than equity transactions (64.11% and 6.79% vs. 38.79% and 1.87% in Panels A and B, respectively). During high uncertainty periods, firms' frequency of access (debt or equity) declines by about 2% relative to the regular accessing pattern of 71% during low uncertainty periods. The corresponding magnitudes of access (shown in Panel B) follow a similar pattern. Clearly, firms are reluctant to make external adjustments (up or down) in their leverage during high uncertainty periods. However, they alter their leverage more often through internal capital changes: 52.79% (high uncertainty periods) vs. 51.77% (low uncertainty periods), an increase of about 2% relative to low uncertainty periods. The magnitude of these internal capital adjustments, however, is lower during high uncertainty periods, similar to external adjustments. The drop in the frequency of issuances for equity is larger in magnitude (-3.62% vs. -2.75%) than debt, indicating that equity is more severely affected by uncertainty due to the higher variable costs. A similar pattern is observed for the incidences of net changes in equity and debt: lower by 3.28% vs. 1.54% during high uncertainty periods, correspondingly. Panel B's related size results are in line with this pattern and indicate a drop of 3.71% and 2.75% relative to low uncertainty periods.

Only the incidences of debt and equity retirement increase with uncertainty (by about 1.42% and 1.18%, correspondingly), however, the volumes of these retirements are significantly lower (by about 1.06% and 3.66%, respectively) and do not result in major changes in leverage. It is possible that a fraction of equity retirements are conducted to counterbalance equity issued as part of employee compensation schemes. Thus, some equity retirements are not necessarily intended to adjust capital structure.¹¹ The documented pattern in equity retirements does not seem to reflect an effort by firms to combat option-related dilution. We find that uncertainty is positively related to equity retirements. Yet, if anything, large stock option exercises are expected to be negatively correlated with uncertainty as option holders are likely to exercise when stock prices are elevated, not depressed.

Next, we estimate a logit model using as controls our proxy variable for uncertainty (*Shifted Election Dummy*) and various firm characteristics (firm size, market-to-book, leverage, profitability,

¹¹ Due to data limitations, we are not able to identify what portion of a given equity retirement is to offset equity issued as part of employee compensation scheme. We analyze this further in Section 5.4 using multivariate regressions.

expected capital expenditures, R&D expenses, cash holdings, depreciation, tangibility, selling expenses, Z-score, and country fixed effects). Apart from expected capital expenditures, right-hand-side variables are lagged one period to alleviate endogeneity concerns. The estimation results are presented in Table 4.

Like univariate results, issuances are negatively affected by uncertainty. The odds ratios, presented at the bottom of the table, suggest that the likelihood of debt and equity issuances both decrease by about nine percentage points during high uncertainty periods. This implies that firms do not make any drastic changes in their capital structure when facing uncertainty, possibly due to higher adjustment costs. Instead, firms rely on internal capital management. During high uncertainty periods, the likelihood of earning retention is sixteen percentage points higher. The coefficient estimates for the control variables are as expected. Alternative uncertainty indicators lead to similar conclusions.

Our transaction costs channel is able to explain quite well the decrease in security issuances (and the increase in earnings retention) under higher uncertainty. However, the relevance of this channel in explaining the changes in security repurchases is less clear, as repurchases likely have different a cost structure than issuances. For example, we find that the odds of retiring (debt or equity) securities slightly increase under high uncertainty, but the results are statistically insignificant. Overall, we find that uncertainty significantly impedes capital markets access and reduces the probability of external capital structure adjustments. The odds of external adjustments to capital structure through debt and equity (issuances net of retirements) are seven and ten percentage points lower under high uncertainty, respectively. This finding is consistent with our second hypothesis, in that, in the face of higher uncertainty, firms are less active in rebalancing their capital structure. Since uncertainty acts as friction hindering firms' desired capital structure adjustments, it is likely that it will also cause delays in firms' convergence toward target leverage levels. We analyze this issue next.

5.3. Financial Intermediation Costs and Adjustment Speeds

An important premise of our paper is that uncertainty affects the speed of adjustment to target leverage. Our reason for this effect is the impact of uncertainty on firms' cost of transacting in the debt and equity markets. The previous subsections illustrate that (1) uncertainty is associated with higher debt and

equity adjustment costs and (2) firms engage in fewer and smaller security transactions during periods of high uncertainty as a result of elevated adjustment (financial intermediation) costs. To further address the adjustment cost channel, we conduct an analysis that links the financial intermediation costs to the speed of adjustment towards the target leverage. While this channel cannot account for all changes in a firm's financing patterns (see our discussion above related to retirements), we conjecture that the significant decline in security issuances would still have a substantial impact on the speed of adjustment.

Insert Table 5 about here.

Table 5 reports the marginal impact of debt and equity costs on adjustment speeds using a pooled regression of the change in leverage to deviations from optimal leverage. Specifically, we estimate Equation (6) using our measure of financial intermediation costs, namely the gross underwriter spreads in SEOs and bond offerings. The estimations control for macroeconomic conditions (GDP Growth), financial development (bond and stock market capitalization), and unobserved country fixed effects. We initially report the results using the raw debt and equity adjustment cost measures. However, a direct test of the financial intermediation channel necessitates isolating the component of adjustment costs that can only be explained by uncertainty. To this end, next, we create uncertainty-driven versions of the adjustment cost variables. The statistical specification we adopt is to estimate, by Ordinary Least Squares (OLS), the coefficients from the linear regression of the debt (equity) financial intermediation costs on *SED*, *CVP*, and *Coalition*. Uncertainty-driven financial intermediation costs for debt and equity (*PFIC_D* and *PFIC_E*) are then calculated as the predicted values from that regression (Online Appendix, Section B2). These fitted (predicted) spreads capture the jump in financial intermediation costs that can only be attributed to uncertainty and allow us to explicitly evaluate our proposed channel of impact.

Table 5 provides direct evidence regarding the roles of debt and equity intermediation costs in explaining variations in the speed of adjustments. The first two columns under (1) indicate a significantly negative impact of financial intermediation costs on adjustment speeds. Using raw spread data, *FIC_D* and *FIC_E*, a standard deviation increase of one in debt and equity adjustment (financial intermediation) costs reduces the speed of adjustment by 5% and 3%, respectively, compared with an average adjustment speed

of 19%. Therefore, consistent with the findings of the existing literature, internationally, adjustment costs have the predicted relation with firms' leverage adjustment speeds (Oztekin and Flannery, 2012).

More importantly, uncertainty-driven spreads (*PFIC_D* and *PFIC_E*) allow a more direct test of the impact of uncertainty on financial intermediation costs and the speed of adjustment. Restricting our attention to the portion of financial intermediation costs that can only be explained by uncertainty yields similar conclusions. Using fitted (predicted) spread data, *PFIC_D* and *PFIC_E*, a standard deviation increase of one in debt and equity adjustment costs reduces the speed of adjustment by 3% and 5%, respectively. These findings lend support to our hypothesis that adjustments costs are a key driver of the relationship between uncertainty and the speed of capital structure adjustment.

In additional robustness tests (Online Appendix, Section B2), we obtain similar conclusions when we (1) orthogonalize each of the adjustment costs and uncertainty measures to economic conditions, (2) employ a larger set of time-varying country-level variables and macroeconomic controls, and (3) use alternative adjustment cost measures. Overall, the empirical evidence lends further support to our second hypothesis: when facing higher financial intermediation costs, firms are slower in rebalancing their capital structure. Since adjustment costs significantly influence financing thresholds, fluctuations in uncertainty (across countries and over time) that determine these costs should influence adjustment speeds.

5.4. *Uncertainty and Adjustment Speeds*

Having established that financial intermediation costs and the speed of adjustment are inversely related, we turn our attention to the relationship between uncertainty and the speed of adjustment.

5.4.1. *Main Results with Our Uncertainty Indicators*

Table 6 reports the results of a pooled regression of the form shown in Equation (6). Panel A employs *Shifted Election Dummy*, *Election Dummy*, *Change Veto Players*, *Coalition*, and *Economic Policy Uncertainty Index* as uncertainty indicators. The control variables are the same as before. The specification in Table 6 is different from that in column 2 of Table 5 in two ways. Firstly, the fitted financial intermediation costs variables in Table 5 are a linear function of the individual uncertainty proxies. Consequently, some important information may have been lost when combining the indices. Secondly, the

fitted spread measures in Table 5 isolate the financial intermediation cost channel, whereas in Table 6, uncertainty may influence adjustment speeds by other channels, such as investment, cash flow, or cost of capital channels. Our results hold when we repeat our tests in the remaining tables using the uncertainty-driven components of the financial intermediation cost measures (*PFIC_D* and *PFIC_E*).

Insert Table 6 about here.

The results shown in Panel A of Table 6 indicate that all proxies of uncertainty matter for capital structure adjustments. The negative coefficient estimates indicate that uncertainty delays convergence to optimal leverage. Compared with the sample mean (median) of 19% (20%), the impact of uncertainty on the adjustment speed is large. A standard deviation increase of one in uncertainty decreases the typical firm's adjustment speed by 2%–8%, capturing 19%–87% of the cross-sectional standard deviation of the adjustment speed estimates. To gauge the economic magnitude of this effect, we compute the half-life of the adjustment speed. An average firm takes about three years to close half of the gap between actual and target leverage. This duration goes up to six years with higher uncertainty.¹²

Next, we employ more comprehensive and detailed measures of uncertainty to assess the specific mechanisms through which uncertainty influences adjustment speeds. First, we present our results with *EPUI* restricted to U.S. firms, and then dissect it into its sub-components (see Section 3.1 for details on these sub-components) to capture the relative impact of various category-specific policy uncertainty measures. The investigation of more detailed categories of uncertainty is important, since each element (or sub-component) of uncertainty has different characteristics that may differently influence adjustment speeds. Our goal is to determine which sub-components impact adjustment speeds more significantly. The lack of data on sub-indices for other countries prevents this analysis from extending beyond the United States. However, our goal is to evaluate whether and how alternate measures of uncertainty affect adjustment speeds differently, and the United States has a large enough set of observations for this purpose. Using these uncertainty measures, we rerun our estimation model using U.S. firms only. The results are

¹² The life time is $\text{LN}(0.5)/\text{LN}(1 - 0.19)$, where 0.19 is the sample average of the adjustment speeds. Since uncertainty slows capital structure adjustments by up to 8%, the upper bound of the half-life under higher uncertainty is calculated as $\text{LN}(0.5)/\text{LN}(1 - 0.11)$.

presented in Panel B of Table 6. For U.S. firms, a standard deviation increase of one in economic policy uncertainty decreases the typical firm's adjustment speed by 3.7% (compared to 6.4% in the overall sample). All uncertainty measures are significantly negatively related to the speed of adjustment. The majority of the explanatory power of the economic policy uncertainty index (*EPUI*) comes from uncertainties related to *Monetary Policy*, *Fiscal Policy*, *Regulatory Policy*, and *Government Policy*, which slow down the speed of adjustment by 1.8%, 2.1%, 2.1%, and 3.9%, respectively, compared to an average speed of adjustment of 20% for U.S. firms. An economically smaller impact originates from the *International Economics Policy*, which leads to a decline of 1.2% in the speed of adjustment. These results are novel to the literature, but are consistent with the conclusions of Baker et al. (2016), who point to fiscal, regulatory, and government policies as important sources of elevated policy uncertainty.

Isolating these impact channels sheds some light on the discussion in the literature seeking to answer the question, "What are the origins (sources) of adverse effects of uncertainty?" For example, an understandable desire of policy-makers to revive the financial markets through various monetary, fiscal, trade, and regulatory policies (e.g., tax incentives, reductions in interest rates, financial deregulations, more open trade policies, reductions in government spending in order to alleviate the crowding out of corporate debt by the government, as in Graham, Leary, and Roberts, 2014) may become counter-productive if uncertainty increases due to changes in the specific policies. Our findings are of interest to policy makers who may want to take into account the responses of firms and financial intermediaries to protracted policy debates.

In short, when uncertainty rises, firms' adjustment towards optimal leverage is significantly delayed. This result is not driven by the dominance of U.S. firms in the sample or the way uncertainty is defined (see Online Appendix, Section B3). For the remainder of this sub-section, we perform various analyses to assess the cross-sectional implications and the robustness of our main results. Specifically, we modify our estimation methodology, conduct sub-sample analyses, perform a falsification test, and analyze the non-linear and asymmetric effects of uncertainty on the adjustment speed.

5.4.2. *Uncertainty and Leverage*

So far, we have given no particular attention to the effects of uncertainty on the level of leverage. Theories of capital structure make predictions about how a firm's leverage could relate to uncertainty. The tradeoff theory posits that a firm's capital structure is the outcome of the tradeoff between the benefits and the costs of debt. It is conceivable that uncertainty affects optimal leverage ($TL_{ij,t}$). A lower leverage would be targeted if higher uncertainty is associated with lower tax shields, higher bankruptcy and agency costs of debt, and lower agency costs of equity.¹³ According to the pecking-order theory, to minimize the adverse selection costs arising from asymmetric information (Myers, 1984; Myers and Majluf, 1984) or managerial optimism (Heaton, 2002), firms first issue internal funds, debt, and then equity.¹⁴ A higher leverage would be expected if uncertainty is associated with higher adverse selection costs and/or higher managerial optimism. According to the market timing theory, firms would alter leverage to exploit favorable pricing opportunities (Baker and Wurgler, 2002; Bonaime, Oztekin, and Warr, 2014). If uncertainty causes a firm's debt (equity) to be underpriced, it should be negatively (positively) associated with leverage.

Any change in the determinants of leverage (including uncertainty) would affect both leverage and financing thresholds. A change in (target) leverage, in turn, would have an indirect effect on the speed of adjustment. In Table 7, Panel A, we present results on such effects and demonstrate that they do not account for all of what we measure as adjustment speed effects. We re-estimate our baseline first-stage regression (Equation 3) for each country with uncertainty added to the list of right-hand-side variables. After explicitly controlling for the effect of uncertainty on target leverage, we find that uncertainty still reduces the speed of convergence towards the target leverage ratio. Our results hold when we allow target leverage to vary with country institutional strength indicators or when we account for the direct as well as the indirect effects of the uncertainty on adjustment speeds (see Online Appendix, Section B4).

Insert Table 7 about here.

¹³ Uncertainty about future cash flows might increase the expected costs of bankruptcy. Uncertainty induces firms to hoard cash and reduce corporate investment (Julio and Yook, 2012). The increase in free cash gives managers higher incentives to pursue their own interests (Jensen, 1986), leading to higher agency costs. The deferral of corporate investment increases the number of growth options relative to assets in place, which are positively associated with bankruptcy costs and agency costs (Frank and Goyal, 2009). Uncertainty may make shirking by managers hard to detect, exacerbating agency problems (Ahmed and Duellman, 2013).

¹⁴ Uncertainty increases information asymmetry and raises moral hazard and adverse selection problems (Kahn and Watts, 2009).

5.4.3. *Sub-Sample Analyses*

Next, we perform several sub-sample analyses for the impact of uncertainty on firm adjustment speeds by (1) investigating the role of executive option exercises, (2) focusing on firms from politically-sensitive industries, (3) and conducting additional identification tests using special cases in which the relationship between uncertainty and the speed of adjustment is expected to be more clearly observable.

Executive options may affect the relationship between uncertainty and adjustment speeds. Uncertainty could lead to slower leverage adjustments by affecting firm employees' decisions to exercise their executive options, which are in turn closely tied to the firm's equity retirement decision (e.g., Kahle, 2002). To evaluate the role of stock option exercises, Panel B of Table 7 conducts an additional analysis, in which we drop firm-year observations with any equity retirement activity. The analysis is based on the assumption that all equity retirements in the sample represent attempts to offset the dilutive effects of the equity issues due to employee compensation schemes (i.e., we assume that the fraction of equity retirements offsetting equity issues as part of employee compensation schemes is 100% in the sample). As such, it indicates an upper bound estimate of the magnitude of such effects. While it is possible that equity retirements are not necessarily intended to adjust capital structure, our conclusions are robust to their exclusion, with uncertainty resulting in adjustment speeds that are lower by 2%–8%.

In the next sub-sample test, we conjecture that some firms are more sensitive to uncertainty than others, as suggested by Julio and Yook (2012) and Colak, Durnev, and Qian (2017). For these firms, we should observe a more significant decline in the speed of adjustment. To test this effect, we classify firms in pharmaceuticals, health care, defense, petroleum, natural gas, telecommunications, and transportation as politically sensitive (as in Julio and Yook, 2012). We then run our adjustment speed estimation with the inclusion of the politically sensitive indicator and its interaction term with the uncertainty measure. As expected, the interaction term between the politically sensitive industry and the uncertainty measure is negative and significant in all specifications in Panel C of Table 7. Greater uncertainty leads to a 2% to 10% slower speed of adjustment, and this negative effect is further amplified by 1%–5% in politically sensitive industries. The interaction term with EPUI is not significant for this test, probably because this

uncertainty measure is available mostly for developed nations, where economic and political gyrations and their impact on certain industries are subdued. We also conduct additional subsample analyses that further pin down the impact uncertainty (Online Appendix, Section B5) and reach similar conclusions.

5.4.4. *Additional Controls, A Falsification Test, Non-Linear and Asymmetric Effects*

Next, we modify our estimation model and (1) account for the firm-specific determinants of adjustment speeds, (2) run a placebo test, and (3) allow for the effects of uncertainty on adjustment speeds to be non-linear and asymmetric.

To determine whether the impact of uncertainty is robust to the inclusion of firm-specific control variables, we re-run our baseline estimations with some firm characteristics that are known to influence firms' adjustment speeds: dividend payer dummy, firm size, industry market-to-book ratio, and the difference between firm and industry market-to-book ratio (Faulkender et al., 2012). These variables capture firms' financial constraints and market timing opportunities.¹⁵ The first five columns of Table 8 indicate some support for the hypothesis that firm characteristics affect the speed of adjustment. More importantly, however, the sign, magnitude, and significance of the uncertainty measures are robust to controlling for the firm-level determinants of the adjustment speeds.

For robustness purposes, we run a placebo test, by assigning random high uncertainty years throughout the sample. In column 6 of Table 8, we document that our results do not hold for random uncertainty events, which now have completely fictitious years of occurrences. This non-result corroborates the notion that our results are not driven by omitted variable bias or endogeneity concerns.

Finally, to permit for asymmetry and nonlinearity in the uncertainty-leverage adjustment speed relationship, we create a set of indicator variables, using our continuous uncertainty measure, the *Economic Policy Uncertainty Index, EPUI*. *Uncertainty lowest (Uncertainty highest)* is a binary variable that is equal to one if *EPUI* is in the bottom (top) quintiles of its distribution, and zero otherwise. *Uncertainty down (Uncertainty up)* is a binary variable that is equal to one if the change in *EPUI* is negative (positive), and

¹⁵ The industry market-to-book variable captures equity valuation effects on the speed of adjustment (as in Warr et al., 2012).

zero otherwise. First, we allow for the impact of uncertainty on the adjustment speed to vary at low(est) and high(est) uncertainty levels. In column 7 of Table 8, we find that high uncertainty slows adjustment by 13%, but that low uncertainty barely affects adjustment with a coefficient that is less than 0.1%, albeit statistically significant. In the next two columns, we also allow for differential responses in the speed of adjustment for upward and downward changes in uncertainty. In column 8, the average effect of uncertainty is to decrease the speed of adjustment by 5.4%. A downward change in uncertainty speeds up adjustment by 6.5% (11.9%) at the lowest (highest) uncertainty level. In column 9, the effect of an upward change in uncertainty on the speed of adjustment is not significant at the lowest uncertainty level and highly significant at the highest uncertainty level. Specifically, the average effect of uncertainty is to decrease the speed of adjustment by 3.1%, with an upward change in uncertainty slowing down adjustment by another 15.7% at highest uncertainty level. Collectively, these results suggest that while high uncertainty significantly increases financial intermediation costs and reduces speed of adjustment, low uncertainty does not affect either one in an economically meaningful way.¹⁶

Insert Table 8 about here.

5.5. *The Effect of Legal and Political Institutions*

Our next analysis considers various institutions that could ameliorate the detrimental influences of uncertainty on the speed of adjustment. North (1991) emphasizes the role of institutions as “to reduce uncertainty by establishing a stable structure to human interaction.” Some institutional features are conducive to hold economic agents and politicians accountable by imposing checks and balances and consequently limiting the range of potential outcomes under uncertainty. Table 9 provides some details on our uncertainty indicators (sources of uncertainty), along with characteristics describing a country’s institutional and political environment, which are expected to mitigate the negative effects of uncertainty in that country. No country scores above median on all of the country-specific dimensions considered in

¹⁶ Underwriter spreads monotonically increase, but at a slower rate at low uncertainty levels and at a faster rate at high uncertainty levels. An asymmetry is also observed in subsamples formed based on firm characteristics: adverse effect of uncertainty on the speed of adjustment is stronger among the underlevered, smaller, and/or less profitable firms (see Online Appendix, Section B6).

this study. Brazil, Greece, Italy, Portugal, Spain, and Turkey are countries that are most exposed to uncertainty risk as they rank poorly on most of the national dimensions examined.

We include institutional indices and their interaction terms with the *Shifted Election Dummy* to our baseline specification and we estimate Equation (6) separately for each country feature, controlling for country fixed effects. The results are reported in Table 10, Panel A. In line with the previous literature (Öztekin and Flannery, 2012), the direct effect of better institutions is to increase leverage adjustment speed due to lower adjustment costs. Firms from English law origin countries, countries with better disclosure to Congress and the public, and countries with better public-sector ethics adjust faster. Presidential systems are also associated with significantly faster leverage adjustment. Even controlling for these country characteristics, uncertainty continues to reduce the typical firm's speed of adjustment, by 1%–4%. However, as expected, good institutions mitigate the detrimental impact of uncertainty in an economy. The interaction term between uncertainty variables and institutional variables is significantly positive with a magnitude ranging from 2%–6%. We fail to reject the hypothesis that the sum of the coefficients on uncertainty and the interaction term is zero at the conventional significance levels. That is, strong institutions and presidential political systems ameliorate the destructive influences of uncertainty, significantly offsetting its negative impact on the speed of adjustment. The aforementioned analysis does not consider the combined effect of uncertainty and institutional strength on target leverage. In Panel B of Table 10, we control for these effects simultaneously. We estimate Equation (3) for the pooled sample with the inclusion of the uncertainty indicator, *Shifted Election Dummy*, the institutional indices and their interaction terms with the uncertainty indicator, and country fixed effects as additional controls. Our original conclusions still hold. Our results are robust to employing additional country features, alternative uncertainty indicators, as well as a different estimation technique for target leverage (see Online Appendix, Section B6).

Insert Table 9 and Table 10 about here.

5.6. *The Recent Financial Crisis (2007–2009)*

Our analyses thus far utilize pre-crisis period data from 1990–2006. We analyze the impact of the recent financial crisis separately by adding a crisis period dummy (*Crisis*) for the firm-year observations from 2007–2009. We also add interaction terms between *Uncertainty Indicator (UI)*, *Crisis*, and country features (*Country*) to disentangle the impact of the crisis on the relationship(s) between adjustment speeds, uncertainty, and a country’s institutions. The results with *SED* are presented in Table 11. Using alternative uncertainty indicators yield similar qualitative conclusions.

Insert Table 11 about here.

Uncertainty (*UI*) reduces the speed of adjustment even after controlling for the crisis years. Strong institutions and presidential systems (*Country*) lead to faster adjustment and alleviate the detrimental effects of uncertainty on the speed of adjustment (*Country*UI*). Adjustment is slower as financial crisis (*Crisis*) creates its own uncertainty.¹⁷ The uncertainty due to the financial crisis, combined with the uncertainty due to political and economic policies (*UI*Crisis*), had a profound effect on firms’ leverage adjustments. In this atmosphere, the benefits of moving faster toward “the comfort” target leverage zone outweigh any increases in the adjustment costs due to uncertainty, as financial distress costs become more material and firms adjust their capital structure even if it is costlier.¹⁸ Strong institutions, as indicated by English law origin and better public disclosure, ameliorate the negative effects of the financial crisis (*Country*Crisis*). In countries with presidential systems, however, the adverse effects of the crisis are more pronounced. The negative triple interaction term, *UI*Country*Crisis*, implies that strong institutions ameliorate the negative impact of the crisis unless the crisis is also accompanied by uncertainty. In summary, adjustment benefits outweigh adjustment costs when financial crisis overlaps with policy uncertainty, but this effect is more relevant in weak institutional settings. In strong institutional settings, financial distress costs are alleviated and adjustment benefits are not enough to counteract the rise in the adjustment costs due to uncertainty.

¹⁷ Flannery, Kwan, and Nimalendran (2013) document an increase in bank adverse selection costs during the crisis. Similarly, Calomiris and Nissim (2014) find that for U.S. financial institutions “prior to the crisis, higher leverage, ceteris paribus, was associated with greater value, but during and after the crisis, as default risk and regulatory concerns came to the fore, lower leverage was associated with greater value.”

¹⁸ An anecdotal example for this kind of behavior is Goldman Sachs Inc.’s issuance of convertible bonds (with very attractive features) to Warren Buffett. Such external financing at the peak of the financial crisis was very costly, but nonetheless the company insisted on the deal. See <http://www.wsj.com/articles/SB12220798359168765>.

6. Concluding Remarks

We analyze firms' leverage adjustments under various types of uncertainty and report new findings that contribute to several research streams. First, we model uncertainty as a determinant of leverage adjustment speeds of firms in different countries. At the upper bound, the speed of adjustment almost halves when uncertainty is high. An average firm takes approximately three years to close half of the gap between its actual and optimal capital structure. This duration goes up to six years with higher uncertainty.

Second, we focus on an important economic channel through which uncertainty affects firms. Uncertainty increases intermediaries' placement costs in the capital markets, which exacerbates financial frictions in the marketplace and forces firms to adjust leverage at relatively higher costs. Increased financial intermediation costs discourage any major adjustment to firm leverage during uncertain times and act as a major impediment to firms achieving their target leverage. This channel mostly operates through security issuances, rather than repurchases. Our results highlight the importance of financial intermediaries in transmitting adverse effects of elevated uncertainty into the corporate sector.

Third, we contribute to the literature that focuses on the institutional environment and its effect on firms' financing policies. We analyze political characteristics whose impact on firms' capital structures have not been studied before. More importantly, we identify some country features that counteract the disruptive effects of uncertainty on the speed of adjustment (more disclosure to congress and/or to the public, higher public-sector ethics, presidential systems).

Finally, our paper contributes to the growing literature that investigates the effects of the recent financial crisis on corporate outcomes. We analyze how the recent financial crisis (2007–2009) affects the relationships among uncertainty, adjustment speeds, and a country's institutional strength. True to its name ("The Balance Sheet Recession"), the financial crisis had a profound negative effect on firm leverage adjustments and has altered the associations between country features and uncertainty.

Overall, our evidence is supportive of the theories that highlight the relevance of leverage adjustment behavior and the disruptive effects of uncertainty and its association with market frictions.

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Table 1
Data description, source, construction, and summary statistics

<i>Panel A. Uncertainty variables</i>			
Variable. Definition. <i>Source.</i>	Mean	Median	Std. Dev.
Election dummy. It shows whether there was an election during that calendar year. We focus on the elections where the chief executive of the government is changing. In the presidential system, it is the presidential elections, and in the parliamentary system, it is the parliamentary elections. <i>Various sources. World Bank's Database of Political Institutions (DPI2012).</i>	0.26	0.00	0.43
Shifted election dummy (SED). When the election is on or before June 30 th , the previous calendar year is assumed to have high election uncertainty. <i>Various sources. World Bank's Database of Political Institutions (DPI2012).</i>	0.25	0.00	0.43
Change veto players (CVP). The variable tabulates the percent of veto players who drop from the government in any given year. The veto players are defined in the following fashion. In presidential systems, if the president does not control the legislature (via closed list and a majority), then veto players are the president and each chamber. If the president gains control of the legislature in time t , then the chambers are counted as no longer being veto players. Similarly, if the president changes and the largest opposition party has a majority in the legislature in time $t-1$, but not in time t , a change in veto players is again recorded. If the largest government party has a majority in the legislature (and there is no closed list) in time $t-1$, but not in time t , a change in veto players is again recorded. In parliamentary systems, if members of the government coalition in $t-1$ are no longer in government in t , that number of veto players changes. Similarly if the prime minister changes and an opposition party has a majority in $t-1$, but that same party does not have a majority in t , then one veto player is said to have dropped. If parliamentary systems go from no government majority or no closed list to a government majority and closed list in time t , then the chambers are counted as no longer being veto players. <i>World Bank's Database of Political Institutions (DPI2012).</i>	0.10	0.00	0.20
Coalition. The Herfindahl index of the government parties forming the coalition (using their seats in the parliament) is calculated. If the Herfindahl index is < 1 , then Coalition = 1; otherwise it is zero. <i>Various sources. World Bank's Database of Political Institutions (DPI2012).</i>	0.35	0.00	0.48
Economic political uncertainty index (EPUI). A news-based economic policy uncertainty index created by Baker et al., (2016). We use the annualized versions of these sub-indices by taking the average of the monthly values for each sub-index. <i>Source: www.policyuncertainty.com</i>	97.02	90.13	37.35
SUB_EPUI. This generic variable represents the category-specific economic policy uncertainty (EPU) sub-indices of EPUI. These sub-indices are news-based and are created using the category-specific policy term sets listed in Online Appendix B of Baker et al. (2016). They are available only for U.S. The sub-indices are: "Entitlement Programs", "Financial Regulation", "Health Care", "Government Spending", "Monetary Policy", "National Security", "Regulation", "Sovereign Debt, Currency Crises", "Taxes", "Trade Policy", "Debt Ceiling," "Government Shutdown". We use the annualized versions of these sub-indices by taking the average of the monthly values for each sub-index. <i>Source: www.policyuncertainty.com</i>			
Monetary Policy. This is the same variable as "Monetary Policy" EPU sub-index.	97.26	86.43	54.47
Fiscal Policy. This is the same variable as "Fiscal Policy" ("Taxes" and "Government Spending") EPU sub-index.	87.23	78.69	45.22
Regulatory Policy. This is the same variable as "Regulation" EPU sub-index.	91.42	77.55	38.45
Governmental Obligations Policy. This is the first principal component of "Healthcare" and "Entitlement Programs" EPU sub-indices.	0	-0.25	1
International Economics Policy. This is the first principal component of "Trade Policy" and "Sovereign Debt, Currency Crisis" EPU sub-indices.	0	-0.16	1

Panel B. Financial intermediation cost and institutional variables			
Variable. Definition. Source.	Mean	Median	Std. Dev.
Equity spread. Total compensation paid to the syndicate on an SEO as a percentage of the proceeds. <i>SDC Global New Issues</i> .	9.92	5.20	10.91
Debt spread. Total compensation paid to the syndicate on a bond offering as a percentage of the proceeds. <i>SDC Global New Issues</i> .	3.02	2.80	1.69
English origin. Categorical variable equal to unity if the firm operates under English law, and zero otherwise. <i>La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998)</i> .	0.66	1.00	0.47
Disclosure to congress. Sources available to congress. It measures the ratio of all source items contained in the country's blank disclosure form available to congress over all source items potentially disclosed in the artificial "universal" form. <i>Djankov, LaPorta, Lopez-de-Silanes, and Shleifer (2010)</i> .	0.28	0.34	0.16
Disclosure to public. Sources publicly available. It measures the ratio of all source items contained in the country's disclosure form available to the public over all source items potentially disclosed in the artificial "universal" form. <i>Djankov et al. (2010)</i> .	0.25	0.33	0.14
Public sector ethics. Percentage of firms in the country giving satisfactory ratings to the questions on honesty of politicians, government favoritism in procurement, diversion of public funds, trust in postal office, and the average bribe frequencies for permits, utilities, and taxes. <i>World Bank's Ethics Indices, Kaufmann (2004)</i> .	67.16	70.10	12.96
Presidential system. A dummy variable taking a value of one if the presidents are elected directly and/or the chief executive of the government is the president (e.g., U.S., Mexico). If the system is parliamentary, this variable is zero (e.g., Canada, Turkey). In a parliamentary system, the prime minister is the head of the government and the president is more of the head of the state (and has veto power, but does not make legislation). <i>Various sources. World Bank's Database of Political Institutions (DPI2012)</i> .	0.49	0.00	0.50
Panel C. Firm, industry, and macroeconomic variables			
Variable. Definition. Source.	Mean	Median	Std. Dev.
Leverage. (Long-term debt plus Short-term debt)/Total assets. <i>Global Vantage</i> .	0.24	0.22	0.20
Profitability. (Operating Income plus Interest and related expense plus Current income taxes)/Total assets. <i>Global Vantage</i> .	0.03	0.06	0.18
Market-to-book. (Long-term debt plus Short-term debt plus Preferred capital plus Market value of equity)/Total assets. <i>Global Vantage</i> .	1.22	0.85	1.33
Depreciation. Total depreciation and amortization/Total assets. <i>Global Vantage</i> .	0.05	0.04	0.03
Firm size. Log (Lagged sales)/Sales. <i>Global Vantage</i> .	0.01	0.01	0.44
Tangibility. Fixed assets/Total assets. <i>Global Vantage</i> .	0.32	0.28	0.22
R&D dummy. A dummy variable equaling one if R&D spending is not reported and zero otherwise. <i>Global Vantage</i> .	0.38	0.00	0.49
R&D expenses. Research and development Expense/Total assets. <i>Global Vantage</i> .	0.02	0.00	0.06
Industry median leverage. Median leverage for the firm's industry. Fama and French (1997) industry categories. <i>Global Vantage</i> .	0.20	0.20	0.10
Dividend payer. A dummy variable equaling one when the firm paid dividends and zero otherwise. <i>Global Vantage</i> .	0.39	0.00	0.49
Industry market-to-book. Average industry market-to-book ratio. <i>Global Vantage</i> .	0.93	0.83	0.36
Firm minus industry market-to-book. Firm minus industry market-to-book ratio. <i>Global Vantage</i> .	0.29	0.00	1.24
Bond market capitalization. Outstanding domestic debt securities divided by GDP. <i>Beck, Demirgüç-Kunt, and Levine (2000)</i> .	56.29	49.39	31.53
Stock market capitalization. The value of listed shares divided by GDP. <i>Beck, Demirgüç-Kunt, and Levine (2000)</i> .	98.47	91.80	45.10
GDP growth. Growth in real GDP. <i>WDI (World Development Indicators), World Bank</i> .	0.02	0.02	0.02
Politically sensitive industry. A dummy variable that equals to one for firms in pharmaceuticals, health care, defense, petroleum, natural gas, telecommunications, and transportation industries. <i>Global Vantage</i> .	0.19	0.00	0.39

Table 2

Financial intermediation costs and uncertainty

The table summarizes median financial intermediation costs (%) during low and high uncertainty periods. Uncertainty measures are *Shifted Election Dummy (SED)*, *Election Dummy*, *Change Veto Players (CVP)*, *Coalition*, and *Economic Policy Uncertainty Index (EPUI)*. Financial intermediation costs reflect the gross underwriter spreads in SEOs and public bond offerings. *, **, and *** indicate significant difference between low and high uncertainty periods at the 10%, 5%, and 1% levels, respectively.

Low Uncertainty vs. High Uncertainty					
Panel A: Debt					
Median Financial Intermediation Costs (%)	Shifted Election Dummy (SED)	Election Dummy	Change Veto Players (CVP)	Coalition	Economic Policy Uncertainty Index (EPUI)
Low Uncertainty	2.70	2.69	2.64	2.74	2.75
High Uncertainty	2.92	2.98	3.13	2.74	2.96
Absolute Difference (bp)	22	29	48	0	21
Relative Difference (%)	8	11	18	0	8
Significance	***	***	***		***
Panel B: Equity					
Median Financial Intermediation Costs (%)	Shifted Election Dummy (SED)	Election Dummy	Change Veto Players (CVP)	Coalition	Economic Policy Uncertainty Index (EPUI)
Low Uncertainty	6.42	6.73	6.54	6.62	9.37
High Uncertainty	8.75	7.80	8.51	9.58	11.37
Absolute Difference (bp)	233	106	197	296	200
Relative Difference (%)	36	16	30	45	21
Significance	***	***	***	***	***

Table 3

Uncertainty and capital structure adjustment patterns: A univariate analysis

The table presents information regarding capital structure adjustment patterns during low uncertainty and high uncertainty years. Uncertainty is measured using the *Shifted Election Dummy* (*SED*) where non-election years indicate low uncertainty periods and election years indicate high uncertainty periods. Panel A presents the incidence of access by reporting the proportion of firms that accessed external capital markets, and how that access breaks down between debt (D.) and equity (E.), and between issuances (Issue) and retirements (Retire). Panel B provides the mean size of capital market access by reporting the magnitude of adjustments (scaled by total assets) either in the form of issuances or retirements. Internal capital adjustment denotes a positive change in retained earnings to total assets. External capital adjustment is defined as a change in the absolute value of outstanding equity or debt exceeding 5% of total assets. An issuance or retirement is defined as having occurred in a given year if the change in equity or debt, normalized by the book value of assets at the end of the previous period, is greater than a certain cutoff. Debt (Equity) is defined as a change in the absolute value of outstanding debt (equity) exceeding 5% of the total assets. Debt issue, debt retirement, and equity issue are each defined as a security issuance or repurchase of at least 5% of the book assets. Equity retirement is defined as a security issuance or repurchase of at least 1.25% of the book assets. *, **, and *** indicate significant difference between low and high uncertainty periods at the 10%, 5%, and 1% levels, respectively.

Low Uncertainty vs. High Uncertainty								
Panel A: Incidence of Capital Market Access								
Frequency of Adjustments (%)								
	Internal	External	Debt	D. Issue	D. Retire	Equity	E. Issue	E. Retire
Low Uncertainty	51.77	71.26	64.11	45.48	18.63	38.79	32.62	13.28
High Uncertainty	52.79	69.99	63.12	44.22	18.90	37.52	31.44	13.43
Absolute Difference	1.02	-1.27	-0.99	-1.26	0.27	-1.27	-1.18	0.15
Relative Difference	1.97	-1.79	-1.54	-2.75	1.42	-3.28	-3.62	1.18
Significance	***	***	***	***	***	***	***	***
Panel B: Mean Size of Capital Market Access								
Size of Adjustments (%)								
	Internal		Debt	D. Issue	D. Retire	Equity	E. Issue	E. Retire
Low Uncertainty	1.63		6.79	7.78	-5.48	1.87	2.12	-1.78
High Uncertainty	1.59		6.61	7.50	-5.42	1.80	2.06	-1.71
Absolute Difference	-0.04		-0.18	-0.28	0.06	-0.07	-0.06	0.07
Relative Difference	-2.26		-2.75	-3.68	1.06	-3.71	-3.13	3.66
Significance	***		***	***	***	***	***	***

Table 4

Uncertainty and capital structure adjustment patterns: A multivariate analysis

This table presents estimation results from logistic regressions modeling the firm's decision to internally manage its capital structure or access to capital markets. Uncertainty indicator is the *Shifted Election Dummy (SED)* where non-election years indicate low uncertainty periods and election years indicate high uncertainty periods. Internal capital adjustment denotes a positive change in retained earnings to total assets. External capital adjustment is defined as a change in the absolute value of outstanding equity or debt exceeding 5% of total assets. An issuance or retirement is defined as having occurred in a given year if the change in equity (E.) or debt (D.), normalized by the book value of assets at the end of the previous period, is greater than a certain cut-off. Debt (Equity) is defined as a change in the absolute value of outstanding debt (equity) exceeding 5% of the total assets. Debt issue, debt retirement, and equity issue are each defined as a security issuance or repurchase of at least 5% of the book assets. Equity retirement is defined as a security issuance or repurchase of at least 1.25% of the book assets. To minimize the endogeneity problem, all of the control variables, except for *Expected CAPX*, are lagged by one year. The definitions and the sources of the control variables are provided in Table 1. Robust standard errors are reported beneath the coefficient estimates. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Internal	Debt	D. Issue	D. Retire	Equity	E. Issue	E. Retire
Uncertainty indicator	0.1491*** (0.015)	-0.0763*** (0.015)	-0.0912*** (0.015)	0.0292 (0.019)	-0.0998*** (0.016)	-0.0909*** (0.017)	0.0282 (0.021)
Market-to-book	-0.0080 (0.007)	0.1107*** (0.007)	0.1723*** (0.006)	-0.2190*** (0.011)	0.3888*** (0.008)	0.3456*** (0.008)	-0.0019 (0.008)
Firm size	0.1240*** (0.023)	0.0343* (0.021)	-0.0202 (0.021)	0.1052*** (0.037)	-0.1944*** (0.023)	-0.1792*** (0.022)	0.0221 (0.026)
Profitability	3.6789*** (0.081)	-0.6933*** (0.052)	0.1622*** (0.050)	-0.7211*** (0.065)	-1.0746*** (0.054)	-1.2227*** (0.054)	1.2466*** (0.087)
Expected CAPX	0.3054** (0.132)	5.5702*** (0.150)	7.9252*** (0.159)	-5.8146*** (0.239)	2.3462*** (0.137)	3.1188*** (0.139)	-2.2276*** (0.199)
R&D expenses	-0.6309*** (0.176)	-0.9928*** (0.150)	-0.8582*** (0.150)	0.3024 (0.186)	0.4235*** (0.160)	1.1393*** (0.161)	-1.6389*** (0.236)
Cash	-0.9592*** (0.054)	-0.7055*** (0.051)	-0.6003*** (0.052)	-0.3074*** (0.069)	0.7793*** (0.055)	0.5660*** (0.055)	0.3595*** (0.072)
Depreciation	0.0069 (0.259)	-0.2447 (0.250)	-4.3516*** (0.261)	5.7880*** (0.301)	-0.9497*** (0.258)	-1.8187*** (0.270)	2.1166*** (0.333)
Tangibility	-0.0534 (0.040)	-1.5069*** (0.041)	-0.8739*** (0.041)	-0.8169*** (0.051)	-0.3831*** (0.043)	-0.3859*** (0.045)	0.0891 (0.057)
Selling expenses	0.0342 (0.037)	0.2291*** (0.035)	0.1565*** (0.034)	0.0873** (0.043)	0.0733** (0.037)	0.1025*** (0.038)	-0.1914*** (0.051)
Z-score	0.0104*** (0.003)	-0.0248*** (0.003)	-0.0026 (0.003)	-0.0565*** (0.005)	-0.0647*** (0.004)	-0.0500*** (0.003)	-0.0246*** (0.004)
Leverage	-0.7439*** (0.040)	1.1268*** (0.041)	-0.4779*** (0.039)	2.1137*** (0.047)	0.0783* (0.041)	0.2551*** (0.043)	-0.5995*** (0.057)
Constant	0.0954 (0.165)	1.0319*** (0.178)	0.5013*** (0.168)	-1.8765*** (0.249)	0.0618 (0.165)	-0.2027 (0.166)	-2.4872*** (0.303)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	107,789	107,789	107,789	107,789	107,789	107,789	107,789
Estimated odds ratios	1.1607	0.9266	0.9129	1.0296	0.9050	0.9131	1.0286
Implied change in the odds	0.1607	-0.0734	-0.0871	0.0296	-0.0950	-0.0869	0.0286

Table 5

Adjustment speeds and financial intermediation costs

The table shows the impact of financial intermediation costs on adjustment speeds using a two-stage procedure. In the (unreported) first stage, we estimate the following reduced-form model of leverage, where λ is the adjustment parameter, X is a set of firm characteristics, L is the leverage ratio, and ε is a random error term, with the inclusion of firm and year fixed effects:

$$L_{ij,t} = (\lambda\beta)X_{ij,t-1} + (1 - \lambda)L_{ij,t-1} + \varepsilon_{ij,t} \quad (3)$$

We estimate this equation separately for each country using Blundell and Bond's (1998) GMM estimator. This estimation provides an initial set of estimated β s and λ s that we use to calculate an initial estimated target leverage ratio ($\widehat{TL}_{ij,t} = \widehat{\beta}_j X_{ij,t-1}$) and distance from the target leverage ratio ($\widehat{DIS}_{ij,t} = \widehat{TL}_{ij,t} - L_{ij,t-1}$) for each firm-year. In the second stage, we substitute the estimated deviation from the target leverage ratio into the partial adjustment equation to produce estimates of the determinants of a firm's adjustment speed:

$$(L_{ij,t} - L_{ij,t-1}) = [\Lambda_{ij,t-1}^{FIC} FIC_{j,t-1} + \Lambda_{ij,t-1}^C H_{j,t-1}] (\widehat{DIS}_{ij,t}) + \delta_{ij,t}. \quad (6)$$

where Λ^{TC} and Λ^C are the vector of coefficients for the adjustment speed function, $FIC_{j,t-1}$ is the gross underwriter spreads (i.e., the financial intermediation cost measures), and $H_{j,t-1}$ is a set of covariates that affect the adjustment speed including a constant, bond and stock market capitalization, GDP growth, and country fixed effects. The columns under (1) employ the raw (unadjusted) gross spreads as the adjustment cost proxies in the regressions. The columns under (2) use the fitted gross spreads as the adjustment cost proxies in the regressions. The fitted spreads are the predicted values from a simple OLS regression of the raw (unadjusted) gross spreads on our uncertainty variables. To conserve the sample size, reported results employ *Shifted Election Dummy (SED)*, *Change Veto Players (CVP)*, and *Coalition*. The definitions and the sources of the variables are provided in Table 1. We transform continuous independent variables to standard normal variables before interacting them with $\widehat{DIS}_{ij,t}$. Standard errors are bootstrapped to account for the generated regressor (Pagan, 1984; Faulkender et al., 2012). The p-values are reported beneath the coefficient estimates. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)		(2)	
	Debt FIC_D	Equity FIC_E	Fitted Debt PFIC_D	Fitted Equity PFIC_E
Financial intermediation cost (<i>FIC</i>)	-0.0520*** (0.000)	-0.0273*** (0.000)	-0.0322** (0.013)	-0.0491*** (0.006)
Bond market capitalization	0.0400*** (0.000)	0.0370*** (0.000)	0.0355 (0.618)	0.0180 (0.806)
Stock market capitalization	0.0166*** (0.000)	0.0342*** (0.000)	0.0238 (0.304)	0.0193 (0.290)
GDP growth	0.0270** (0.000)	0.0283*** (0.000)	0.0428** (0.024)	0.0453** (0.027)
Constant	0.1606*** (0.000)	0.1484*** (0.000)	0.1454*** (0.126)	0.1547*** (0.059)
Country fixed effects	Yes	Yes	Yes	Yes
Observations	118,820	118,820	118,820	118,820
R-squared	0.146	0.138	0.130	0.137

Table 6
Main adjustment speed results

The table presents our main results using a large set of uncertainty measures. The table notes are identical to those presented for Table 5, except for Equation (6) where financial intermediation cost measure, $FIC_{j,t-1}$ is replaced by $UI_{j,t-1}$, the uncertainty indicator. In Panel A, the uncertainty indicators are *SED*, *Election Dummy*, *CVP*, *Coalition*, and *Economic Policy Uncertainty Index (EPUI)*. The sample includes all countries with available values for the corresponding uncertainty indicators. In Panel B, the uncertainty indicators are *EPUI* and various categorical policy indices forming *EPUI* (*Monetary Policy*, *Fiscal Policy*, *Government Policy*, *Regulatory Policy*, and *International Economics Policy*). The sub-indices are available only for the U.S. firms, which is why the sample size in these estimations is smaller. The definitions of the uncertainty indicators are in Table 1 and the text. The p-values are reported beneath the coefficient estimates. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Results for our uncertainty indicators (Full sample)

	(1)	(2)	(3)	(4)	(5)
	Shifted Election Dummy (SED)	Election Dummy	Change Veto Players (CVP)	Coalition	Economic Policy Uncertainty Index (EPUI)
Uncertainty indicator (UI)	-0.0448*** (0.000)	-0.0453*** (0.000)	-0.0186*** (0.000)	-0.0843*** (0.000)	-0.0636*** (0.000)
Bond market capitalization	0.0301*** (0.000)	0.0301*** (0.000)	0.0279*** (0.000)	0.0089*** (0.006)	0.0788*** (0.000)
Stock market capitalization	0.0427*** (0.000)	0.0426*** (0.000)	0.0401*** (0.000)	0.0312*** (0.000)	0.0277*** (0.000)
GDP growth	0.0395*** (0.000)	0.0395*** (0.000)	0.0375*** (0.000)	0.0447*** (0.000)	0.0300*** (0.000)
Constant	0.1612*** (0.000)	0.1613*** (0.000)	0.1477*** (0.000)	0.1876*** (0.000)	0.1346*** (0.000)
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	118,820	118,820	118,820	118,780	97,650
R-squared	0.137	0.137	0.137	0.143	0.147

Panel B: Results for our uncertainty indicators (U.S. sample)

	(1)	(2)	(3)	(4)	(5)	(6)
	EPUI U.S. firms	Monetary Policy	Fiscal Policy	Government Policy	Regulatory Policy	International Economics Policy
Uncertainty indicator (UI)	-0.0366*** (0.001)	-0.0179*** (0.000)	-0.0214*** (0.004)	-0.0385* (0.084)	-0.0210*** (0.006)	-0.0118*** (0.000)
Bond market capitalization	-0.0131 (0.295)	-0.0040 (0.716)	0.0051 (0.621)	0.0067 (0.500)	0.0061 (0.553)	0.0061 (0.536)
Stock market capitalization	0.0276*** (0.000)	0.0265*** (0.000)	0.0192*** (0.002)	0.0185*** (0.003)	0.0190*** (0.003)	0.0166*** (0.007)
GDP growth	0.0024 (0.716)	0.0129*** (0.004)	0.0100* (0.072)	0.0166*** (0.000)	0.0128*** (0.010)	0.0081*** (0.007)
Constant	0.2926*** (0.000)	0.2677*** (0.000)	0.2617*** (0.000)	0.2355*** (0.000)	0.2617*** (0.000)	0.2359*** (0.000)
Observations	51,865	51,865	51,865	51,865	51,865	51,865
R-squared	0.194	0.194	0.193	0.193	0.193	0.194

Table 7

Adjustment speeds after controlling for uncertainty in the target leverage, excluding equity retirements, and accounting for firms from politically sensitive industries

The table presents variations of our main estimation model as presented in Table 6. The table notes are identical to those in Table 5, except for Equation (6) where financial intermediation cost measure, $FIC_{j,t-1}$ is replaced by $UI_{j,t-1}$, the *Uncertainty Indicator* (*Shifted Election Dummy*, *SED*; *Election Dummy*; *Change Veto Players*, *CVP*; *Coalition*, and *Economic Policy Uncertainty Index*, *EPUI*). Further changes are made to our main estimation procedure. In Panel A, Equation (3) includes $UI_{j,t-1}$ so that target leverage also varies with uncertainty. In Panel B, equity retirements are excluded from the analysis. Equity retirement is defined as having occurred in a given year if the change in equity, normalized by the book value of assets at the end of the previous period, is greater 1.25% of the book assets (alternative cutoffs lead to similar conclusions). In Panel C, the vector $H_{j,t-1}$ now includes a politically sensitive dummy, the interaction term between the politically sensitive dummy and the uncertainty indicator, in addition to the control variables in Table 5. The estimated coefficients on the control variables (Bond market capitalization, Stock market capitalization, GDP growth, and constant) are similar to those reported in Table 6 and hence are not reported to save space. The p-values are reported beneath the coefficient estimates. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
	SED	Election Dummy	CVP	Coalition	EPUI
Panel A: Adjustment speeds after controlling for uncertainty in leverage targets					
Uncertainty indicator (UI)	-0.0253*** (0.000)	-0.0233*** (0.000)	-0.0845*** (0.000)	-0.0860*** (0.000)	-0.0874*** (0.000)
Controls	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	118,820	118,820	118,820	118,780	97,650
R-squared	0.153	0.153	0.154	0.160	0.166
Panel B: Adjustment speed results after excluding equity retirements					
Uncertainty indicator (UI)	-0.0239*** (0.000)	-0.0228*** (0.000)	-0.0169*** (0.000)	-0.0845*** (0.000)	-0.0612*** (0.000)
Controls	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	105,153	105,153	105,153	105,152	84,971
R-squared	0.138	0.138	0.139	0.147	0.151
Panel C: Adjustment speeds of firms from politically sensitive industries					
Uncertainty indicator (UI)	-0.0337*** (0.000)	-0.0341*** (0.000)	-0.0151*** (0.000)	-0.0787*** (0.000)	-0.1029*** (0.000)
Politically sensitive	0.0230*** (0.000)	0.0233*** (0.000)	0.0175*** (0.000)	0.0384*** (0.000)	0.0273*** (0.000)
UI x Politically sensitive	-0.0168** (0.030)	-0.0176** (0.023)	-0.0081** (0.024)	-0.0450*** (0.000)	0.0000 (0.147)
Controls	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	118,820	118,820	118,820	118,780	97,849
R-squared	0.110	0.110	0.110	0.123	0.115

Table 8

Firm level determinants of adjustment speeds, a falsification test, asymmetric and nonlinear adjustment

The table notes are identical to those presented for Table 5, except for Equation (6) where financial intermediation cost measure, $FIC_{j,t-1}$ is replaced by $UI_{j,t-1}$, Uncertainty indicator (*Shifted Election Dummy*, *SED*; *Election Dummy*; *Change Veto Players*, *CVP*; *Coalition*; *Economic Policy Uncertainty Index*, *EPUI*, *Random Uncertainty*) and $H_{j,t-1}$ which now includes a dividend payer dummy, firm size, industry market-to-book ratio, and the firm's industry-adjusted market-to-book ratio, in addition to the control variables in Table 5. *Uncertainty lowest (highest)* is an indicator variable that is equal to one if the *EPUI* is in the bottom (top) quintile of its distribution. *Uncertainty down (up)* is an indicator variable that is equal to one if the change in the *EPUI* is negative (positive). *Random Uncertainty* is a false definition of uncertainty whereby high uncertainty years are randomly assigned throughout the sample. The p-values are reported beneath the coefficient estimates. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	SED	Election Dummy	CVP	Coalition	EPUI	Random Uncertainty	Asymmetric and Nonlinear Adjustment EPUI		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Uncertainty indicator (UI)	-0.0357*** (0.000)	-0.0364*** (0.000)	-0.0182*** (0.000)	-0.0599*** (0.000)	-0.0636*** (0.000)	-0.0025 (0.558)		-0.0542*** (0.000)	-0.0311*** (0.000)
UI x Uncertainty lowest							-0.0008*** (0.000)		
UI x Uncertainty highest							-0.1332*** (0.000)		
Uncertainty down x Uncertainty lowest								0.0652*** (0.000)	
Uncertainty down x Uncertainty highest								0.1189*** (0.000)	
Uncertainty up x Uncertainty lowest									0.0004 (0.100)
Uncertainty up x Uncertainty highest									-0.1566*** (0.000)
Bond market capitalization	0.0193*** (0.000)	0.0193*** (0.000)	0.0166*** (0.000)	0.0068* (0.050)	0.0628*** (0.000)	0.0293*** (0.000)	0.0246*** (0.000)	0.0518*** (0.000)	0.0145*** (0.007)
Stock market capitalization	0.0347*** (0.000)	0.0346*** (0.000)	0.0321*** (0.000)	0.0281*** (0.000)	0.0233*** (0.000)	0.0252*** (0.000)	0.0149*** (0.000)	0.0263*** (0.000)	0.0185*** (0.000)
GDP growth	0.0396*** (0.000)	0.0396*** (0.000)	0.0382*** (0.000)	0.0429*** (0.000)	0.0334*** (0.000)	0.0367*** (0.000)	0.0186*** (0.000)	0.0342*** (0.000)	0.0148*** (0.000)
Dividend payer	-0.0652*** (0.000)	-0.0651*** (0.000)	-0.0700*** (0.000)	-0.0476*** (0.000)	-0.0613*** (0.000)	-0.0685*** (0.000)	-0.0385*** (0.000)	-0.0600*** (0.000)	-0.0378*** (0.000)
Firm size	0.0002 (0.955)	0.0002 (0.946)	0.0004 (0.909)	-0.0004 (0.896)	-0.0008 (0.786)	0.0001 (0.979)	-0.0023 (0.415)	-0.0013 (0.630)	-0.0027 (0.370)
Industry market-to-book	-0.0005 (0.767)	-0.0006 (0.750)	-0.0009 (0.567)	-0.0029 (0.125)	-0.0050*** (0.002)	-0.0008 (0.564)	-0.0074*** (0.000)	-0.0060*** (0.000)	-0.0085*** (0.000)
Firm minus industry market-to-book	0.0160*** (0.000)	0.0161*** (0.000)	0.0157*** (0.000)	0.0161*** (0.000)	0.0138*** (0.000)	0.0166*** (0.000)	0.0125*** (0.000)	0.0135*** (0.000)	0.0114*** (0.000)
Constant	0.1819*** (0.000)	0.1820*** (0.000)	0.1737*** (0.000)	0.1922*** (0.000)	0.1598*** (0.000)	0.1721*** (0.000)	0.2386*** (0.000)	0.1527*** (0.000)	0.2532*** (0.000)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	118.820	118.820	118.820	118.780	97.650	118.820	97.650	97.650	97.650
R-squared	0.148	0.148	0.149	0.150	0.157	0.145	0.169	0.161	0.176

Table 9

Descriptive Statistics of Country Characteristics and Uncertainty

The table presents various country characteristics that are related to the uncertainty prevalent in a country. The first six columns present the sources of uncertainty: the number of national elections conducted in each country between 1990 and 2006 (the total number of elections in our sample is 167), the average number of years a given country is under election uncertainty (using *SED*), the change in percentage of veto players that were voted out of office per year (i.e., the mean of the *CVP*), what percentage of years the country was run with a coalition government, the average of Baker et al. (2016)'s *EPUI* across the years for which it is available, and whether the political system of the country is presidential system or not. The last four columns present various country characteristics and institutions that might mitigate the negative effects of uncertainty: whether the legal system of the country is from English law origin, whether the country has a high level of disclosure to congress and high level of disclosure to public, and the perceived level of governmental and public ethics in a country as ranked by the firms located in that country. See Table 1 for formal definitions of these variables.

Country	Elections (N=167)	Avg. SED	Avg. CVP	Coalition	Avg. EPUI (yrs)	Presidential System	English Origin	Disclosure to Congress	Disclosure to Public	Public Sector Ethics
Argentina	3	0.18	0.15	35.29%	--	1	0	0.61	0.61	21.80
Australia	6	0.29	0.06	58.82%	69.88 (9)	0	1	1.00	1.00	78.60
Austria	6	0.35	0.06	100.00%	--	0	0	0.24	0.24	67.80
Belgium	4	0.24	0.06	100.00%	--	0	0	0.48	0.29	64.10
Brazil	4	0.24	0.10	100.00%	99.93 (16)	1	0	0.50	0.00	35.20
Canada	5	0.29	0.06	0.00%	98.33 (17)	0	1	0.94	0.92	59.70
Chile	3	0.18	0.20	70.59%	--	1	0	0.51	0.51	62.90
Columbia	5	0.24	0.19	70.59%	--	1	0	0.60	0.27	22.60
Denmark	5	0.29	0.13	100.00%	--	0	0	0.00	0.52	93.60
Finland	4	0.29	0.13	100.00%	--	0	0	0.00	0.44	93.80
France	3	0.18	0.17	100.00%	93.70 (17)	0	0	0.55	0.00	61.40
Germany	5	0.29	0.08	100.00%	93.99 (14)	0	0	0.65	0.65	74.30
Greece	5	0.24	0.24	17.65%	--	0	0	0.28	0.00	39.80
India	5	0.29	0.29	100.00%	57.69 (4)	0	1	0.38	0.00	31.70
Indonesia	4	0.24	0.18	41.18%	--	1	0	0.68	0.18	47.30
Ireland	3	0.24	0.10	100.00%	81.96 (16)	0	1	0.57	0.57	64.10
Israel	6	0.35	0.19	100.00%	--	1	1	0.83	0.00	64.30
Italy	5	0.29	0.29	29.41%	99.81 (10)	0	0	0.36	0.18	33.90
Japan	6	0.29	0.25	64.71%	90.40 (17)	0	0	0.28	0.26	62.00
Malaysia	4	0.24	0.07	88.24%	--	0	1	0.00	0.00	58.60
Mexico	3	0.18	0.09	35.29%	--	1	0	0.62	0.00	23.30
N. Zealand	6	0.35	0.22	70.59%	--	0	1	0.79	0.79	89.70
Norway	4	0.24	0.22	76.47%	--	0	0	0.00	0.65	90.10
Pakistan	4	0.24	0.22	46.67%	--	0	1	0.21	0.21	10.30
Peru	5	0.24	0.13	58.82%	--	1	0	0.38	0.00	23.50
Philippines	3	0.18	0.17	82.35%	--	1	0	0.34	0.34	7.60
Portugal	5	0.29	0.22	17.65%	--	0	0	0.64	0.64	60.40
Singapore	4	0.24	0.06	0.00%	--	0	1	0.00	0.00	92.70
S. Africa	3	0.18	0.18	70.59%	--	0	1	0.66	0.66	42.20
S. Korea	3	0.18	0.14	35.29%	100.57 (11)	1	0	0.40	0.40	40.90
Spain	4	0.24	0.12	23.53%	106.02 (6)	0	0	0.52	0.24	59.40
Sweden	5	0.29	0.16	76.47%	87.24 (17)	0	0	0.31	0.31	84.00
Switzerland	4	0.24	0.06	100.00%	--	0	0	0.22	0.22	81.70
Taiwan	5	0.29	0.03	17.65%	--	1	0	0.38	0.38	65.90
Thailand	6	0.35	0.25	93.75%	--	0	1	0.59	0.59	36.30
Turkey	4	0.24	0.25	64.71%	--	0	0	0.38	0.00	27.50
UK	4	0.24	0.08	0.00%	81.50 (10)	0	1	0.83	0.83	79.70
U.S.	4	0.24	0.04	0.00%	99.68 (17)	1	1	0.87	0.87	70.10

Table 10

Country characteristics and uncertainty

The table has two related panels. Panel A notes are identical to those presented for Table 5, except for Equation (6) where financial intermediation cost measure, $FIC_{j,t-1}$ is replaced by $UI_{j,t-1}$, the uncertainty indicator (*Shifted Election Dummy, SED*), and $H_{j,t-1}$ which now consists of a constant, a country feature (English origin, disclosure to congress, disclosure to public, public sector ethics, and presidential system), the interaction term between the country feature and uncertainty, and country fixed effects. $P(UI + UI \times Country = 0)$ is the p-value from the test of the hypothesis that the sum of the coefficients on Uncertainty indicator and on Uncertainty indicator x Country feature is zero. Panel B notes are similar to the ones in Panel A, except for Equation (3) which is now estimated for the pooled sample, and includes the uncertainty indicator (UI), a country feature, the interaction term between the country feature and uncertainty, and country fixed effects as additional controls. The p-values are reported beneath the coefficient estimates. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
	English Origin	Disclosure to Congress	Disclosure to Public	Public Sector Ethics	Presidential System
Panel A: Interactions of country characteristics and uncertainty indicators					
Uncertainty indicator (UI)	-0.0129*** (0.000)	-0.0294*** (0.000)	-0.0375*** (0.000)	-0.0286*** (0.000)	-0.0252*** (0.000)
Country	0.1907*** (0.000)	0.3084*** (0.000)	0.2719*** (0.000)	0.0465*** (0.000)	0.1267*** (0.000)
UI x Country	0.0239*** (0.001)	0.0391*** (0.004)	0.0552*** (0.000)	0.0156** (0.012)	0.0273*** (0.000)
Constant	0.0584*** (0.000)	-0.0113*** (0.000)	0.0128*** (0.000)	0.1432*** (0.000)	0.0900*** (0.000)
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	118,820	118,820	118,820	118,820	118,820
R-squared	0.172	0.165	0.159	0.120	0.137
$P(UI + UI \times Country = 0)$	0.1388	0.2629	0.0941	0.1552	0.6751
Panel B: Controlling for uncertainty and institutional strength in leverage targets					
Uncertainty indicator (UI)	-0.0141*** (0.000)	-0.0433*** (0.000)	-0.0333*** (0.000)	-0.0631*** (0.000)	-0.0083*** (0.006)
Country	0.0455*** (0.000)	0.0671*** (0.000)	0.0631*** (0.000)	0.0006*** (0.000)	0.0389*** (0.000)
UI x Country	0.0287*** (0.000)	0.0740*** (0.000)	0.0627*** (0.000)	0.0010*** (0.000)	0.0132*** (0.006)
Constant	0.1137*** (0.000)	0.1104*** (0.000)	0.1111*** (0.000)	0.1091*** (0.000)	0.1144*** (0.000)
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	118,820	118,820	118,820	118,820	118,820
R-squared	0.122	0.124	0.123	0.121	0.118

Table 11

Country characteristics, uncertainty indicators, and the financial crisis of 2007-2009

The sample period covers 1990-2012. The table notes are identical to those presented for Table 5, except for Equation (6) where financial intermediation cost measure, $FIC_{j,t-1}$ is replaced by $UI_{j,t-1}$, the uncertainty indicator (SED, *Shifted Election Dummy*) and $H_{j,t-1}$ which now consists of a constant; a country feature (English origin, disclosure to congress, disclosure to public, public sector ethics, and presidential system); the interaction term between the country feature and the uncertainty indicator (UI); a Crisis dummy (takes value of 1 for years 2007 through 2009 and 0 otherwise); an interaction term between uncertainty indicator and the crisis dummy; an interaction term between the country feature and the crisis dummy; the triple interaction term involving the uncertainty indicator, the country feature, and the crisis dummy; and country fixed effects. $P(UI + UI \times Country + UI \times Country \times Crisis = 0)$ and $P(UI + UI \times Crisis + UI \times Country \times Crisis = 0)$ are the p-values from the tests of the hypothesis that the sum of the coefficients on (UI, UI x Country, and UI x Country x Crisis) and (UI, UI x Crisis, and UI x Country x Crisis) are zero, respectively. The p-values are reported beneath the coefficient estimates. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
	English Origin	Disclosure to Congress	Disclosure to Public	Public Sector Ethics	Presidential System
Uncertainty indicator (UI)	-0.0210*** (0.000)	-0.0442*** (0.000)	-0.0522*** (0.000)	-0.0450*** (0.000)	-0.0321*** (0.000)
Country	0.1731*** (0.000)	0.3046*** (0.000)	0.2716*** (0.000)	0.0512*** (0.000)	0.1649*** (0.000)
UI x Country	0.0255*** (0.002)	0.0516*** (0.001)	0.0678*** (0.000)	0.0165*** (0.002)	0.0443*** (0.000)
Crisis	-0.0102*** (0.000)	-0.0309*** (0.000)	-0.0257*** (0.000)	-0.0462*** (0.000)	-0.0183*** (0.000)
UI x Crisis	0.2734*** (0.000)	0.2132*** (0.000)	0.2276*** (0.000)	0.2009*** (0.000)	0.1826*** (0.000)
Country x Crisis	0.0449*** (0.000)	0.0620*** (0.005)	0.0359* (0.057)	-0.0070 (0.284)	-0.2353*** (0.000)
UI x Country x Crisis	-0.3364*** (0.000)	-0.2182*** (0.000)	-0.2329*** (0.000)	-0.0201 (0.148)	0.0506*** (0.000)
Constant	0.0552*** (0.000)	-0.0119*** (0.000)	0.0108*** (0.000)	0.1389*** (0.000)	0.0810*** (0.000)
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	171,662	171,662	171,662	171,662	171,662
R-squared	0.144	0.144	0.137	0.102	0.128
$P(UI + UI \times Country + UI \times Country \times Crisis = 0)$	0.0000	0.0000	0.0001	0.0000	0.0000
$P(UI + UI \times Crisis + UI \times Country \times Crisis = 0)$	0.0603	0.0000	0.0000	0.0000	0.0000